



MEDICAL FORUM MONTHLY

APNS
Member

CPNE
Member

ABC
Certified

RECOGNISED BY PMDC & HEC

Journal of all Specialities

"Medical Forum" Monthly Recognised and Indexed by

- PMDC with Index Pakistan No. 48 Since 1998
- HEC Since 2009
- Pakmedinet Since 2011
- Medlip (CPSP) Since 2000
- PASTIC & PSA Since 2000
- NLP Since 2000
- WHO, Index Medicus (IMEMR) Since 1997
- EXCERPTA MEDICA, Netherlands Since 2000
- EMBASE SCOPUS Database Since 2008
- Registered with International Serials Data System of France bearing ISSN No. 1029-385X Since 1992
- Registered with Press Registrar Govt. of Pak bearing No. 1221-B Copr. Since 2009
- ABC Certification Since 1992
- On Central Media List Since 1995
- Med. Forum Published from Lahore Since 1989
- Peer Review & Online Journal
- Electronic Publication of Journal Now Available on website: www.medforum.pk

MEDICAL FORUM MONTHLY

ISSN 1029 - 385 X (Print)

ISSN 2519 - 7134 (Online)

APNS
MemberCPNE
MemberABC
Certified

Peer Review Journal

Online Journal

Published Since 1989

e-journal available on: www.medforum.pk

Medical Forum Recognized and Indexed by

PMDC-IP-0048 (1998), HEC-Y-Category (2009), Pastic and PSA, Isd (2000), Medlip, Karachi (2000), NLP, Isd (2000), Pakmedinet, Isd (2011), Excerpta Medica, Netherlands (2000), EMBASE Scopus Database (2008), Index Medicus (IMEMR) WHO (1997), ABC Certification, Govt. of Pak. (1992), Central Media list, Govt. of Pak (1995), Press Reg. No.1221-B Copr (2009)

Editorial Executives

Patron-in-Chief

Dr. Mahmood Ali Malik
Prof. of Medicine

Editor-in-Chief

Dr. Azhar Masud Bhatti
Public Health Specialist & Nutritionist

Managing Editor

Dr. Nasreen Azhar
Consultant Gynaecologist

Co-Editors

Tahir Masud Jan (Canada)
Dr. Meshaal Azhar (Pak)
Dr. Faryal Azhar (Pak)

Editor

Dr. Mohsin Masud Jan

Associate Editors

Dr. Syed Mudassar Hussain (Pak)
Dr. M. Mohsin Khan (Pak)
Dr. Iftikhar A. Zahid (Pak)

National Editorial Advisory Board

Prof. Abdul Hamid	Forensic Medicine	Sialkot	03239824782	drabdulhamid12345@hotmail.com
Prof. Abdullah Jan Jaffar	Peads Medicine	Quetta	03008380708	ajanjaffar@yahoo.com
Prof. Abdul Khaliq Naveed	Biochemistry	Rawalpindi	03215051950	khalignaveed2001@yahoo.com
Prof. Aftab Mohsin	Medicine	Gujranwala	03314101516	aftabmohsin@yahoo.com
Prof. Anjum Habib Vohra	Neurosurgery	Lahore	03008443218	omer@brain.net.pk
Prof. Asad Aslam Khan	Ophthalmology	Lahore	03008456377	drasad@lhr.comsats.net.pk
Prof. Haroon Khurshid Pasha	Paed. Surgery	Multan	03008633433	haroonkpasha@hotmail.com
Prof. Kh. M. Azeem	Surgery	Lahore.	03334242122	khawaja.azeem@sihs.org.pk
Prof. Khalid Masood Gondal	Surgery	Lahore	03328483823	rc_lahore@csp.edu.pk
Prof. M. Amjad	ENT	Lahore	03334254695	professoramjad@yahoo.com
Prof. M. Amjad Amin	Surgery	Multan	03336103262	dramjadamin@gmail.com
Prof. M. Iqbal Mughal	Forensic Medicine	Lahore	03009448386	miqbalmughal@hotmail.com
Prof. M. Sabir	Anatomy	Lahore	03005183021	raosabirdr62@gmail.com
Prof. Mahmood Nasir Malik	Medicine	Lahore	03009487434	nasirphysician@yahoo.com
Prof. Majeed Ahmad Ch.	Surgery	Lahore	03008440415	prof_abdulmajeed@hotmail.com
Prof. Mian Rasheed	Forensic Medicine	AJK	03025033559	drmian1000@hotmail.com
Prof. Pervez Akhtar Rana	Forensic Medicine	Lahore	03009422511	pzrana@gmail.com
Prof. Rukhsana Majeed	Community Medicine	Quetta	03337808138	majidrukhsana@hotmail.com

Prof. Safdar Ali Shah	Urology	Lahore	03334391474	drsafdar-ali@hotmail.com
Prof. Sardar Fakhar Imam	Medicine	Lahore	03008451843	drfakhar@lhr.paknet.com.pk
Prof. Shahid Mehmood	Surgery	Rawalpindi	03215001120	shahid63@gmail.com
Prof. Syed M. Awais	Orthopaedics	Lahore	03334348716	awais@kemu.edu.pk
Prof. Syed Nazim Hussain Bukhari	Medical & Chest Diseases	Lahore	03009460515	nhbokhari@yahoo.com
Prof. Zafarullah Ch.	Surgery	Lahore	03072222533	administrator@csp.edu.pk

International Editorial Advisory Board

Dr. Tahir Abbas	Medical Oncology	Canada	001306717852	drtgabbas@gmail.com
Dr. Amjad Shad	Neurosurgery	UK	447963442419	amjad.shad@uhcw.nhs.uk
Dr. Ghazanfar Ali	Gastroenterology	UK	447800760008	ghazanfarali@hotmail.com
Dr. Haider Abbas	Urology	UK	447816149374	haidersyed@hotmail.com
Dr. Khalid Rashid	Cardiology	UK	447740477756	khalid.rashid@cht.nhs.uk
Dr. Iqbal Adil	Surgery	UK	447872969928	drmiadil@hotmail.com
Dr. M. Shoaib Khan	Medicine	UAE	00971503111420	msksd2000@yahoo.com
Dr. Shahid Ishaq Khan	Cardiology	USA	0019014855214	shahidishaqkhan@gmail.com
Dr. Shakeel Ahmad Awaisi	Orthopaedic	USA	0013134638676	msawaisi786@gmail.com
Dr. Basil Nouman Hashmi	Surgery	UK	00447806611517	basilhashmi@doctor.net.uk
Dr. Sohail Saied	Surgery	UK	00441923285114	sohailsaied@gmail.com
Dr. Safdar Ali	Cardiology	USA	0016307816668	safdarali@sbcglobal.net
Dr. Ejaz Butt	Pathology	KSA	00966551349289	drejazbutt@hotmail.com
Dr. Syed Taqadas Abbas	ENT	KSA	00966597052906	taqadasdr@yahoo.com
Dr. Shoab Tarin	Ophthalmology	UK	00447515370995	shoaibtarin@gmail.com
Dr. Parashu Ram Mishra	Surgery & Gastroenterology	Nepal	+9779841233450	drparashuram.mishra@gmail.com
Dr. Mansoor M. Mian	Psychiatry	USA	+1 (972)375 7821	mmian2000@yahoo.com
Dr. Sohail Qureshi	Orthopaedic	UK	00447734329666	quraishisohail@yahoo.com
Dr. Mushtaq Ahmad Mughal	Orthopaedics	UK	00447971886006	mahmed01@blueyonder.co.uk
Dr. Mansoor Tahir	Radiology	UK	00447921838093	drmansoortahir@yahoo.com

Business Manager: Nayyar Zia Ch.

**Legal Advisors : Jan Muhammad Bhatti, Kh. Ejaz Feroz (Barrister),
Kh. Mazhar Hassan & Firdos Ayub Ch. (Advocates)**

Published By: Dr. Nasreen Azhar, Gohawa Road, Link Defence / New Airport Road,
Opposite Toyota Motors, Lahore Cantt. Lahore. **Mobile Nos.** 0331-6361436,
0300-4879016, 0345-4221303, 0345-4221323. **E-mail:** med_forum@hotmail.com,
medicalforum@gmail.com **Website: www.medforum.pk**

Printed By: Syed Ajmal Hussain, Naqvi Brothers Printing Press, Darbar Market, Lahore

Rate Per Copy: Rs.1500.00

Subscription Rates Annually: Pakistan (Rs.15000.00), USA & Canada (US\$ 500.00), China, Japan,
UK & Middle East (US\$ 450.00)

Recognized by PMDC

CONTENTS

Recognized by HEC

Editorial

1. **HIIT VS LISS: The More Potent Fat Burner?** _____ 1
Mohsin Masud Jan

Original Articles

2. **Sexual Dimorphism of Sacrum by its Morphometric Analysis in Southern Punjab Pakistan** _____ 2-5
1. Mujahid Akbar Mamoun 2. Asad Bilal Arif 3. Jawad Sodhar 4. Mazhar ul Haque
3. **Treatment Outcome of Infantile Spasms in Neurology Clinic at Wah Cantt** _____ 6-9
1. Tahir Mahmood 2. Shahzad Haider 3. Sohail Ashraf
4. **Current Trends of Empirical Treatment of Typhoid Fever among General Practitioners in District Kohat, Khyber Pakhtunkhwa, Pakistan** _____ 10-13
1. Muhammad Ashraf 2. Niamat ullah 3. Gulmaizar Khan 4. Sohail Aziz Paracha
5. **Effectiveness of Vacuum-Assisted Closure Therapy as a Pretreatment for Split Thickness Skin Grafts** _____ 14-17
1. Moiz Sadiq 2. Fahad Hanif Khan 3. Syed Sheeraz ur Rahman 4. Obaid-ur-Rahman
6. **Obstructive Sleep Apnea and Blood Pressure: A Cross Sectional Study in Our Local Population** _____ 18-21
1. Ambreen Qamar 2. Hafiz Syed Imran-ul-Haq 3. Rashid Ahmed 4. Afsheen Qamar
7. **Anemia in Patients Suffering from Chronic Kidney Disease** _____ 22-26
1. Shamsuddin Shaikh 2. Syed Qaiser Husain Naqvi 3. Jawaid Hussain Lighari
8. **Dental Caries Determinants in High School Students of Public Sector in District Sialkot** _____ 27-31
1. Rehana Kausar 2. Nadia Munir 3. Naveed Inayat 4. Khalid Ismail
9. **Effect of Glycemic Control on Homocystine Levels in Type 2 Diabetes Mellitus - A Six Month Follow-up Study** _____ 32-35
1. Zulfania 2. Soheb Rehman 3. Tahir Gaffar
10. **Mortality Associated with Isolated Pathogens in Neonatal Sepsis at Izzat Ali Shah Hospital, Wah Cantt** _____ 36-39
1. Shahzad Haider 2. Sajid Nazir 3. Khushboo Sehar 3. Munazza Saleem
11. **Depression in Patients with Rheumatoid Arthritis** _____ 40-43
1. Syed Shayan Ali 2. Munir Hussain 3. Babar Bashir 4. Jawwad us Salam
12. **Prevalence of Complications of Tuberculous Meningitis in Patients Presenting to Paediatric Department** _____ 44-48
1. Muhammad Qasim Khan 2. Kiramat Ullah Wazir 3. Sajjad Ali 4. Muhammad Fazil
13. **Comparison of Awareness and Knowledge of Oral Cancer Among Medical and Dental Undergraduate Students in Bacha Khan Medical College, Mardan** _____ 49-53
1. Muhammad Naeem 2. Shakeel Anwar 3. Munib Muhammad
14. **Evaluation of Stroke in Diabetic and Non-Diabetic Patients** _____ 54-57
1. Syed Qaiser Husain Naqvi 2. Shamsuddin Shaikh 3. Jawaid Hussain Lighari
15. **Disastrous Effects of Fracture Treatment by Traditional Bone Setters** _____ 58-61
1. Zahoor Illahi Soomro 2. Allah Nawaz Abbasi 3. Karam Ali Shah 4. Kishore Kumar Khatri
16. **Efficacy of Trans-Abdominal & Trans-Vaginal Repair in the Management of Vesico-Vaginal Fistula** _____ 62-64
1. Qamar Raza Brohi 2. Muhammad Ali Suhail 3. Habib ur Rehman Khan Toor
17. **Study of UTI Causing Organisms in Patients Visiting Tertiary Care Hospitals** _____ 65-67
1. Muhammad Amjad 2. Muhammad Shafiq 3. Muhammad Safdar

- 18. A Retrospective Study on the Principal of “No Space-No Cell” to Reduce Epithelial Cell Proliferation Resulting in Reduced Posterior Capsular Opacification Following Cataract Surgery** __ 68-71
1. Ali Afzal Bodla 2. Muhammad Afzal Bodla
- 19. Pain Free Negative Pressure Wound Therapy** _____ 72-75
1. Obaid Ur Rahman 2. Moiz Sadiq 3. Ali Adnan 4. Syed Sheeraz Ur Rahman
- 20. Prevalence of Hepatitis B and Hepatitis C in Transfusion Dependent Thalassemia Patients** ____ 76-79
1. Iftikhar Ahmed 2. Shahid Iqbal 3. Aida Waheed
- 21. Factors Predicting Poor Outcome in Gunshot Injuries to Brain** _____ 80-83
1. Muhammad Yousuf Shaikh 2. Muhammad Aamir Saghir 3. Salman Sharif 4. Samir Irfan
- 22. Role of Phloroglucinol in Reducing Duration of Active 1st Stage of Labour** _____ 84-86
1. Mahham Janjua 2. Rabia Wajid 3. Aleena Sarwar
- 23. Outcome of Fixation of Displaced and Unstable Tibial Shaft Fractures in Paediatric Age Group Patients by Using Titanium Flexible Intramedullary Nails** _____ 87-90
1. Zulfiqar Ahmed 2. Muhammad Nasir Ali 3. Zirwa Nasir

Guidelines and Instructions to Authors _____ i-ii

Editorial

HIIT VS LISS: The More Potent Fat Burner?

Mohsin Masud Jan

Editor

Have you ever wondered if the cardio exercises you're doing are really the best way to reach your goals? Whether you want to run faster, sleep better, lower your body fat percentage or have more stamina during your workouts, it's super important to understand that not all cardio is created equal!

Especially when it comes to running, there are two very different types of cardiovascular exercise available – HIIT and LISS cardio. HIIT stands for High-Intensity Interval Training, and LISS stands for Low-Intensity Steady State training.

So, now that we know the names of these two types, it's important to understand the differences between them, especially if you want to fine tune your results so you can reach your goals faster! Each cardio type, both HIIT and LISS, provides very different benefits and results. And ideally, a great exercise program factors in a balance of both! So, what is the difference between HIIT & LISS cardio? Let's dive in!

The body has three different energy systems, which is very important to understand when we are looking at the difference between the two different types of cardio – HIIT and LISS.

1. The Phosphagen System: This is the energy system in your body that kicks in during the first 10 seconds of all movement and is primarily used in intense but short spurts of high-intensity exercise. The body relies on stored ATP, creatine and phosphates to generate energy during these first 10 seconds. The phosphagen system is especially helpful for power-based athletes or anyone interested in improving their performance during rapid and/or explosive movements.

2. The Anaerobic System: The anaerobic system is utilized for energy during short bouts of intense exercise lasting from 10 seconds to up to 2 minutes of work. This system is the one the body uses during proper HIIT workouts. During this 10-second to 2-minute phase, the body primarily uses stored glycogen in the muscles, but no oxygen is yet involved in the energy transfer process.

Training anaerobically and doing HIIT workouts a few times per week is a great way to get stronger and faster, have more endurance in your runs, burn more calories (even while you sleep), increase your metabolism, and improve your overall physical performance. It's also

great for helping boost metabolism, preserve the body's lean muscle mass and gaining cardiovascular and fat burning benefits.

3. The Aerobic System: After 2 minutes, the body starts using oxygen for energy inside the muscular system. Aerobic exercise can last from 10 minutes up to 2 hours by using this oxygenated blood to transfer energy to the working muscles.

In the case of running, marathon training or long-distance running are great examples of aerobic exercise. LISS is a low intensity, long duration example of this type of training. LISS is great for increased energy, better blood flow, a stronger heart, overall cardiovascular health, and in the initial stages of a workout program, effective fat burning.

Now, that we have learnt about the different systems of energy production in the body, and the types of cardiovascular exercise that mainly targets those systems, let's move on to our final verdict.

As we established before, anaerobic training is very intense, so, it should not be done every day because the body needs time to recover and rebalance. HIIT cardio should only be done 1-2x per week for the average person. Since these high-intensity workouts push the body's anaerobic threshold or capacity to continue high-intensity work, the body experiences an "afterburn" effect post-workout where it takes several hours to return back to a state of homeostasis, or a rebalancing of the body's "energy in, energy out" balance. Even though you shouldn't do HIIT cardio every day, this means that between your HIIT sessions you will continue to burn more calories even after the workout has ended. So you will still be burning calories, even while you sleep! Make sure you push yourself to your physical limits, but keep in mind it is critical that your exercise form is perfect. The second your form fails, you should stop or rest.

Now, Most people can (and should) fit some sort of low-intensity steady state cardio into their daily routine, simply for the massive cardiovascular benefits it brings. But if you're aiming to be faster, stronger, fitter, and have more endurance, plus want to capitalize on the long-term benefits of increased metabolism – make sure to add in 1-2 HIIT workouts per week as well!

Sexual Dimorphism of Sacrum by its Morphometric Analysis in Southern Punjab Pakistan

Mujahid Akbar Mamoun¹, Asad Bilal Arif², Jawad Sodhar³ and Mazhar ul Haque¹

ABSTRACT

Objective: To determine the Sexual Dimorphism of Sacrum in Southern Punjab Pakistan.

Study Design: Observational study

Place and Duration of Study: This study was conducted at the Quaid-a-Azam Medical College, Bahawalpur and Sheikh Zayed Medical College, Rahim Yar Khan during June 2016 to December 2016.

Materials and Methods: The measurement has been taken from median straight and curved line longitudinally and transversally on ventral side. First sacral body's transverse diameter, base, antero-posterior diameter and breadth of alae were measured. The curvature index of longitudinal measurement and index of corporobasal areas were measured and analyses were done statistically.

Results: Mid ventral straight measurement, curved length of midventral areas, transverse base diameter, diameter of antero-posterior side of first sacral vertebra and alae's breadth were more significant in males while index of sacrum was more significant in females. Index of corporobasal area was found more and insignificant in females statistically.

Conclusion: Functional differences of sacrum are present both in male and female in the pelvic girdle that's why for identification it is important in both sexes in the human.

Key Words: Sexual Dimorphism, Sacrum, Sacral Parameters, Corporobasal Index, Sacral Index

Citation of articles: Mamoun MA, Arif AB, Sodhar J, Haque M. Sexual Dimorphism of Sacrum by its Morphometric Analysis in Southern Punjab Pakistan. Med Forum 2018;29(9):2-5.

INTRODUCTION

Correct assessment of gender from an unidentified skeleton of human-being may be a difficult assessment when remains of incomplete human skeleton are found. Five sacral vertebrae are fused and form a single triangular sacral body which is taking part for the formation of postero superior wall of pelvic cavity. These vertebra are present at the middle hip bones.^{1,2} Spinal axis is counted from sacrum by Neuroradiologist whereas radiologist of cross-section of abdomen see the sacrum as a bone forming pelvic posterior border.³ In males and females sacrum is diamorphically different.^{4,5} Methods of non-metric type are available with what sex can be estimated from the sacrum, but these methods are unclear and unproven. In the male the sacrum is longer and less wider than in female; the greater angle is formed in the lower half than the upper; the upper half is nearly straight, the amount is greatest in curvature in lower half.

The bone is also directed more obliquely backward; this increases the size of the pelvic cavity and renders the sacrovertebral angle more prominent.

In the male, the curvature is more evenly distributed over the whole length of the bone, and is altogether larger than in the female. Anatomists has deep interest in sacrum, medico-legal experts and anthropologists for establishing its sex, because it has a pivot role for the formation of pelvic girdle where it has a different function in male and female.⁶ Thus sacrum assumes an applied importance in determining sex with the help of measurements carried upon it.⁷

Sacrum is an important bone both in male and female for making the pelvic cavity while it is more important in females for bearing the brunt of pregnancy.⁸ A data for making the base line in Southern Punjab, has been added in the existing literature for sexual diamorphism in sacrum.

MATERIALS AND METHODS

This study was conducted in the Department of Anatomy at Shahida Islam Medical College, Lodharan, Sheikh Zayed Medical College, Rahim Yar Khan and Quaid-e-Azam Medical College, Bahawalpur during the period June, 2016 to December, 2016. Fifty adult sacral bones were collected from the anatomy department of above mentioned medical colleges. The bones having fracture, wear & tear or showing any sign of pathology were excluded from the study. Vernier calipers was

¹. Department of Anatomy / Surgery² / Pharmacology³, Shahida Islam Medical College, Lodhran.

Correspondence: Dr. Mazhar ul Haque, Assistant Professor of Anatomy, Shahida Islam Medical College, Lodhran.

Contact No: 0331-3565277

Email: drmazhar79@gmail.com

used for linear measurement and the measuring tape was used for curved distances. Table one is showing the parameters related to sacrum, measured in this study. In these measurements, three indices were calculated for the sacra which are given in the In Table 2 three indices were given after measuring and calculating from sacra of male and female.

The two subsamples were made from original sample, the 10 females and 40 males respectively. The measurements are mentioned in table one. The indices were calculated and put in to table two. The measurements obtained was checked, tabulated, analysed statistically, using maximum and minimum values, means deviation from standard and confidence value 95% interval of mean. Student's t test (independent) was applied and significant differences were calculated for the two samples.

RESULTS

The mean \pm SD of mid ventral straight length (cm) in male sacrum is 10.41 ± 1.26 while in female is 9.18 ± 0.71 and P value 0.005 which is significant. The mid ventral curved length in male sacrum is 11.35 ± 1.06 while in female is 10.45 ± 0.62 and P value is 0.013 which is

significant. The ventral straight breadth in centimeter in male sacrum is 10.31 ± 0.78 while in female is 10.17 ± 0.70 , has P value as 0.612 which is insignificant. The transverse diameter of base in male sacrum is 11.18 ± 0.84 while in female is 10.44 ± 0.78 , having P value is 0.015 which is significant. The transverse diameter of 1st sacral vertebra in male is 4.76 ± 0.71 while in female is 4.55 ± 0.48 having P value is 0.380 which is insignificant. The antero posterior diameter of S1 In male is 3.15 ± 0.41 while in female is 2.85 ± 0.23 with the P value 0.033 which is significant. In male the breadth of alae is 3.35 ± 0.37 while in female is 3.00 ± 0.43 having P value <0.001 which is highly significant. Sacral index percentage in male is 100.24 ± 12.54 while in female is 111.74 ± 14.6 shows P value as 0.016 which is quite significant. In male the longitudinal curvature index is 91.59 ± 6.43 while in female is 87.87 ± 5.67 , having P value 0.101 which is insignificant. The corporobasal index percentage in male is 43.22 ± 4.28 while in female is 43.84 ± 5.44 , having P value is 0.598 as shown in Table-03. The P values of all the parameters are significant except ventral straight breadth, transverse diameter of 1st sacral vertebra as is given in Table-3.

Table No.1: Various sacral parameters of the study

Sr. No.	Parameter (cm)	Method	Shown in Fig.1
1.	Midventral Straight Length [2]	The midpoint of the sacral promontory to the middle of anteroinferior border of the fifth sacral vertebra	AB
2.	Midventral Curved Length	Length of the curved median line drawn along ventral surface from the middle of sacral promontory to midpoint of anteroinferior border of 5th sacral vertebra	AB dotted
3.	Ventral Straight breadth [7]	Straight distance across the ventral surface of the first sacral vertebra between the widest margins of lateral wings	CD thick line
4.	Transverse Diameter Base	Maximum transverse width of the superior surface of sacrum, comprising the two alae	EF
5.	Transverse Diameter Body S1 [8]	Maximum transverse diameter of the articular surface of the body of first sacral vertebra	E'F'
6.	AP Diameter Body S1 [3]	Anteroposterior distance from the midpoint of sacral promontory up to the mid-point on the posterior border of body of S1	AL
7.	Breadth of Alae	Straight distance of the ala of the sacrum from the transverse diameter of the body of first sacral vertebra	EE' & FF'

Table No.2: Defining various indices of sacrum studied

Sr. No.	Index	Calculated as
1.	Sacral Index	$= \frac{\text{Anterior straight breadth of sacrum (Sr. No. 3)}}{\text{Midventral straight length of sacrum (Sr. No. 1)}} \times 100$
2.	Longitudinal curvature index	$= \frac{\text{Midventral straight length of sacrum (Sr. No. 1)}}{\text{Midventral curved length of sacrum (Sr. No. 2)}} \times 100$
3.	Corporobasal index	$= \frac{\text{Corpus width of S1 (Sr. No. 5)}}{\text{Breadth of base of sacrum (upper surface) (Sr. No. 4)}} \times 100$

Table No.3: Results of sacral parameters in the present study and their statistical evaluation

Sr. No.	Parameter	Sex	Mean + S.D.	Range	95% CI	P-value
1.	Mid ventral Straight Length (cm)	M	10.41+1.26	6.82-13.12	10.01-10.80	0.005*
		F	9.18+0.71	8.31-10.70	8.73-9.62	
2.	Mid ventral Curved Length(cm)	M	11.35+1.06	9.60-14.10	11.02-11.68	0.013*
		F	10.45+0.62	9.80-11.60	10.07-10.83	
3.	Ventral Straight breadth(cm)	M	10.31+0.78	8.70-11.90	10.07-10.55	0.612
		F	10.17+0.70	9.50-11.80	9.73-10.61	
4.	Transverse Diameter Base(cm)	M	11.18+0.84	9.70-13.60	10.92-11.44	0.015*
		F	10.44+0.78	9.50-11.90	9.95-10.92	
5.	Transverse Diameter Body S1(cm)	M	4.76+0.71	1.40-6.50	4.54-4.99	0.380
		F	4.55+0.48	3.90-5.50	4.26-4.85	
6.	AP Diameter Body S1(cm)	M	3.15+0.41	2.40-4.41	3.02-3.28	0.033*
		F	2.85+0.23	2.60-3.28	2.71-2.99	
7.	Breadth of Alae (cm)	M	3.35+0.37	2.57-4.20	3.24-3.46	<0.001**
		F	3.00+0.43	2.58-4.00	2.74-3.27	
8.	Sacral Index (%)	M	100.24+12.54	78.04-149.56	96.36-104.1	0.016*
		F	111.74+14.6	88.79-140.48	102.65-120.84	
9.	Longitudinal Curvature Index (%)	M	91.59+6.43	71.04-112.26	89.59-93.58	0.101
		F	87.87+5.67	80.43-98.12	84.36-91.38	
10.	Corporobasal Index (%)	M	43.22+4.28	32.87-54.81	41.89-44.55	0.598
		F	43.84+5.44	32.77-52.38	40.47-47.21	

Abbreviations: CI- Confidence Interval, S.D.-Standard Deviation, St.- Straight,S1- First Sacral Vertebra, p-value- Significance by Students T-Test, *- Significant, **- Highly significant

Table No.4: Comparison of Sacral parameters amongst different population groups

Author(Year) Population	Davivongs (1963) Australian Aborigines		Raju et al (1980) Varanasi		Mishra et al (2003) Agra		Ubi Esseini et al (2014) Nigeria		Present Study 2015	
Sex (N)	M (50)	F (50)	M (33)	F (11)	M (74)	F (42)	M(50)	F(50)	M (40)	F (10)
1.Mid ventral Straight Length(cm)	9.65	8.81	10.50	9.27	10.75	9.06	11.41	9.18	10.41	9.18
2.Mid ventral Curved Length(cm)	10.43	9.71	11.28	10.48	11.96	10.95	12.35	10.95	11.35	10.45
3.Ventral Straight breadth (cm)	9.99	10.12	-	-	10.53	10.58	11.31	11.17	10.31	10.17
4.Transverse Diameter Base(cm)	-	-	10.53	10.35	-	-	11.38	10.49	11.18	10.44
5.Transverse Diameter Body S1(cm)	4.74	4.41	4.73	4.21	4.91	4.28	6.76	4.55	4.76	4.55
6.AP Diameter Body S1(cm)	2.98	2.76	3.03	2.76	3.00	2.93	4.15	2.85	3.15	2.85
7. Breadth of Alae (cm)	-	-	-	-	2.89	3.17	3.75	3.00	3.35	3.00
8.Sacral Index (%)	104.16	115.49	100.85	111.39	98.21	117.84	100.24	110.74	100.24	111.74
9.Longitudinal Curvature Index (%)	92.46	90.80	92.77	88.51	95.72	90.72	91.59	87.87	91.59	87.87
10.Corporobasal Index (%)	47.42	43.62	44.94	40.96	46.54	40.47	43.42	43.84	43.42	43.84

DISCUSSION

Many studies are present for reliable sex estimation on the basis of quantitative assessment for sexual dimorphic traits of the sacrum.⁹ Pelvic girdle is formed by sacrum, sex can be estimated by this portion due to its location and size differences as by its diameter, length and width in both male and female sex. Lesser degree of curvatures are present in case of female due

to accommodation of child in uterus and large inlet of the female pelvis.⁸ The angle of curvature at different points along the entire anterior surface, breadths and lengths of sacrum are measured. Straight breadth of anterior surface of first sacral vertebra is most dependable measurement for diamorphic sexual trait.⁹ The measurement of maximum sacral breadth creates doubtful reliability of sexual variation in detecting sexual diamorphism in male and female.¹⁰

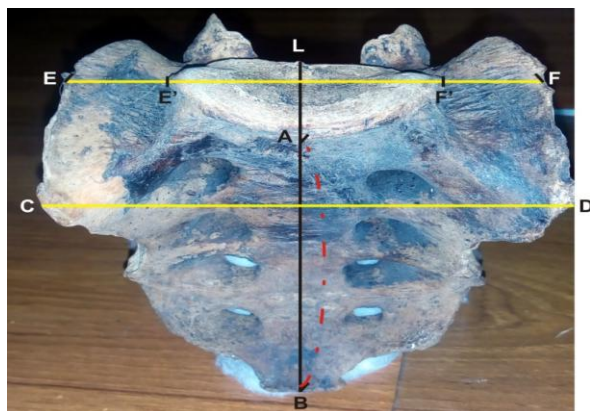


Figure No.1: Measurements in cm of sacrum. L A- Anteroposterior diameter of body of S1, A-B(Black line): Mid ventral straight length, A-B(Red dotted line): Mid central curved length, E-F(Black line): Transverse diameter of S1, E-F(Yellow line): Transverse diameter of base, C-D(Yellow line): Breath of ala



Figure No.2: Shows sacral index and longitudinal curvature index

In male and female the sacrum has different functions in pelvic girdle that's why it has its own importance in both sexes to perform its functions. For sacral identification in male and female, seven parameters are obtained, five parameters giving significant mean differences. These were Mid ventral straight length, Mid ventral curved length, diameter of antero-posterior surface of first Sacral vertebra and ala's breadth, basal transverse diameter of base; all being less in the females and more in males. The present work is the same as has been proved previously while opposite results were obtained in case of ala's breadth and coroprobasal index.^{11,12,13} In case of males, the wide ala's were present while in females the index of corporobasal is more.

CONCLUSION

Functional differences of sacrum are present both in male and female in the pelvic girdle that's why for identification it is important in both sexes in the human. In this study, five parameters are significant in mean differences between male and female sexes while just

two are insignificant. These were mid ventral straight length, this is the first parameter, in second parameter the mid ventral length is curved, basal diameter transversely, ala's breadth and diameter of first sacral vertebra anterior to posterior; all these parameters are increased in males and decreased in females. In females the sacral indices are more significant.

Author's Contribution:

Concept & Design of Study: Mujahid Akbar Mamoun
 Drafting: Asad Bilal Arif
 Data Analysis: Jawad Sodhar, Mazhar ul Haque
 Revisiting Critically: Asad Bilal Arif
 Final Approval of version: Mujahid Akbar Mamoun

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Kataria SK, Kulhari P, Kataria KR, Potaliya P. A study of the sacral index in western Rajasthan population in comparison with other races. *Int J Anat Res* 2014;2:383-85.
2. Newell RLM. Osteology. S. Standring, editors. *Gray's Anatomy The Anatomical Basis of Clinical Practice*. Paris: Churchill Livingstone;2008.p. 724-28.
3. Xu R, Ebraheim NA, Gove NK. Surgical anatomy of the sacrum. *Am J Orthop* 2008;37:E1-E177.
4. Kamal MA, Shamim A. Significance of Sacral Index in Estimation of Sex in Sacra of Cadavers in Bangladesh. *Bangl J Anat* 2013;11(1): 11-14.
5. Benazzi S, Maestri C, Parisini S, Vecchi F, Gruppioni G. Sex Assessment from the Sacral Base by Means of Image Processing. *J Forensic Sci* 2009;54(2):249-54.
6. Alt KW, Rösing FW, Teschler-Nicola M: Dental anthropology: Fundamentals, limits and prospects: Springer Science & Business Media, 2012.
7. Krishan K. Anthropometry in forensic medicine and forensic science-'forensic anthropometry'. *Int J Foren Sci* 2007;2(1):1-12.
8. Plochocki JH. Sexual dimorphism of anterior sacral curvature. *J Foren* 2011;56:161-4.
9. Flander LB: Univariate and multivariate methods for sexing the sacrum. *Am J Physical Anthropol* 1978;49:103-10.
10. Benazzi S, Stansfield E, Milani C, Gruppioni G. Geometric morphometric methods for three-dimensional virtual reconstruction of a fragmented cranium: the case of Angelo Poliziano. *Int J Legal Med* 2009;123:333-44.
11. Patel MM, Gupta BD and Singel TC. Sexing of Sacrum by Sacral Index and Kumra's Base-Wing Index. *J Ind Acad Foren Med* 2005;27(1): 5-9.
12. Baptist M, Sultana F, Farzana F. Sex differences in sacra in the Punjab region. *Biomedica* 2008;24(23): 152-57.
13. Cheng JS, Song JK. Anatomy of the Sacrum. *Neurosurg Focus* 2003;15(2):1-9.

Treatment Outcome of Infantile Spasms in Neurology Clinic at Wah Cantt

Tahir Mahmood¹, Shahzad Haider² and Sohail Ashraf²

ABSTRACT

Objective: To analyse the treatment outcome of cases with infantile spasms presented in Paediatric Neurology clinic at POF Hospital and Izzat Ali Shah Hospital Wah Cantt.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Neurology clinic at POF Hospital and Izzat Ali Shah Hospital, Wah Cantt and we consecutively enrolled patients with infantile spasms from a period of 12 months from 1st July 2017 to 30th June 2018.

Materials and Methods: All patients with infantile spasms who presented in Paediatric neurology clinic were analysed. Primary outcome was the improvement in spasms after 6 months of treatment. Treatment was given as Prednisolone, Vigabatrin or combination of both. Data like gender, age of onset of spasm, spasm type, aetiology, developmental delay, head size, pathology, EEG findings, neuroimaging results and outcome in the form of improvement was recorded. Data was analysed in SPSS version 19.

Results: Total 25 patients were studied, 64% of them were male and age of first spasms was < 6 months in 72% of cases. Spasm type was flexor in 56% of the children, 80% of the children had symptomatic type of spasms with development was delayed in 76% of the cases. Hypoxic ischemic encephalopathy was the main pathological cause (40%), Brain atrophy was the commonest finding on neuroimaging and modified hypsarrhythmia was found in EEG in 52% of cases. Most of the patients (n=13) were given prednisolone trial and >80% improvement in spasms was seen with all the treatment but combination therapy was mostly effective (60%), though it was not statistically significant. Vigabatrin was effective in patients with Tuberous sclerosis complex.

Conclusion: In our study infantile spasms mostly affected males with symptomatic type and associated with developmental delay. Combination therapy of Prednisolone and Vigabatrin was found to be the most effective treatment. Vigabatrin is an effective treatment in cases of Tuberous sclerosis.

Key Words: Infantile Spasms, Tuberous sclerosis, Prednisolone, Vigabatrin

Citation of articles: Mahmood T, Haider S, Ashraf S. Treatment Outcome of Infantile Spasms in Neurology Clinic at Wah Cantt. Med Forum 2018;29(9):6-9.

INTRODUCTION

Infantile spasms (IS) is a rare age-specific type of seizure, which occurs in West syndrome, A characteristic EEG appearance called hypsarrhythmia and a high risk of severe developmental delay are other features of the syndrome.¹ The onset of these characteristics spasm typically seen between 4 to 7 months.² These seizures typically present with a triad of lightning (involving the entire body), nodding (convulsions of the throat and neck flexor muscles) and Salaam or jackknife attacks (rapid bending of the head and torso forward and simultaneous raising and bending

of the arms) Infantile spasms are distinct from myoclonic and tonic seizures. They are characterized by a contraction phase followed by a more tonic phase. The contraction phase may be a flexor spasm, extensor spasm, or a combination of both and these could be symmetrical or asymmetrical.³ The etiology is variable and includes cortical malformations, neurocutaneous syndromes, inherited metabolic disorders, perinatal brain injuries (asphyxia, hypoglycemia, sepsis, and meningitis), and postnatal acquired brain injuries such as meningitis and head trauma.² Based on etiology, West syndrome is classified as symptomatic with known etiology and idiopathic (unknown etiology).⁴ Infantile spasm is an age-specific epilepsy syndrome, often associated with a poor prognosis in terms of epilepsy and cognitive outcome. Infantile spasms may present in different ways. There may be single episodes rather than clusters [Infantile spasms single-spasm variant (ISSV)], Hypsarrhythmia without infantile spasm (HWIS) and infantile spasms without hypsarrhythmia (ISW).⁵ Major obstacles to achieve significant progress in treating these patients are the relative rarity of the syndrome, their heterogeneous etiologies and the variable evolutions that limit the reported cases to small numbers with different follow-

¹. Department of Paediatrics, POF Hospital, Wah Medical College, Wah Cantt.

². Department of Paediatrics, Izzat Ali Shah Hospital, Wah Medical College, Wah Cantt.

Correspondence: Dr. Shahzad Haider, Consultant Paediatrician, Izzat Ali Shah Hospital, Wah Medical College, Wah Cantt.

Contact No: 0333-5247886

Email: shahzadhaider5@gmail.com

Received: July, 2018;

Accepted: August, 2018

up period.⁶ Because of the poor response rate, a wide variety of drugs are used to treat IS the world over. However, two commonly used forms of therapy are adrenocorticotrophic hormone (ACTH) and prednisolone (or prednisone). More than 40 years ago, ACTH was used empirically to treat these seizures with some success and later on oral steroids were tried as well.¹ In the last decade, Vigabatrin has been shown to be the first anticonvulsant to have a significant response rate for infantile spasms but serious visual field defect has been found in approximately one-third of treated adults and is known to occur in children.⁷ The treatment of infantile spasms has been quite a challenge for the Paediatric neurologist as the entity appears to be resistant to many conventional antiepileptic drugs. Agents that have been used in the treatment of infantile spasms include Benzodiazepams (especially Nitrazepam), Sodium Valproate, Vigabatrin (VGB), Corticosteroids, ACTH, Ketogenic diet, Vitamin B6, intravenous Gammaglobulin, a Benzodiazepam-Carbamazepine combination, topiramate and zonisamide etc.⁷ Vigabatrin is available in Europe but not readily in many countries including Pakistan. There is some evidence that excess of corticotrophin releasing hormone (CRH) may be the common pathway for the development of seizures in the developing brain⁷.

MATERIALS AND METHODS

Many children with poorly controlled seizures are referred to our Paediatric Neurology clinics at POF hospital and Izzat Ali Shah Hospital, Wah Cantt. We studied the clinical profile of patients diagnosed with infantile spasms. This was a cross sectional study. The diagnosis of IS was made when child presented with characteristic seizures (flexor or extensor spasms, eye deviation alone or in combination) and in addition EEG showed hypsarrhythmia or one of its variants.¹ All patients diagnosed with IS on basis of history of characteristic salaam spasms as described above and had been followed up for 6 months on treatment were included in the study over 12 months period from 1st July 2017 to 30th June 2018. The following data from the patients obtained: gender, age of onset of infantile spasm, spasm type, aetiology, developmental delay, head size, pathology, EEG and neuroimaging findings, and response to treatment in the form of improvement which was >80%, 50 to 80% or <50% reduction in spasms as judged by the parents. Patients were given Prednisolone, Vigabatrin or combination of both. Oral prednisolone was given as 2mg per kg per day for 4 weeks followed by tapering in next 2 weeks except for the patients diagnosed with TSC. Children receiving oral prednisolone were seen at 2-week intervals in Paediatric Neurology clinic. Blood sugar, urine analysis and stool for occult blood were performed whenever indicated. Because of lack of free availability and cost issues ACTH was not given to any

patient. Vigabatrin was given in a starting dose of 15 to 20 mg/kg/day which was increased up to maximum of 70 mg/kg/day. In combination therapy, Prednisolone was given with a dose of 2 mg/kg/day for first two weeks and then Vigabatrin was added. Later Prednisolone was tapered off but Vigabatrin was continued.

RESULTS

Total 25 patients were included in the study from the Paediatric neurology follow up clinic. Table 1 shows that 16 (64%) children were male and 9 (36%) were female. Eighteen (72%) patients had their first infantile spasm prior to age of 6 months. Flexor type of infantile spasms was the predominant clinical type in 56% of patients (n=14). Twenty (80%) patients were classified as symptomatic infantile spasm. Developmental delay was noted in 19 (76%) patients. Microcephaly was found in 14 (56%) patients. Hypoxic ischemic encephalopathy (HIE) was the main diagnosis in 10 (40%) children while Tuberous Sclerosis (TSC) was found in 9 (36%) patients. All cases of HIE exhibited microcephaly with head size < -2 SD. Neuroimaging showed brain atrophy in 10 (40%), periventricular leukomalacia in 3 (12%), calcification in 4 (16%), tubers in 2 (8%) and other findings in 6 patients. Encephalomalacia were significant findings in patients with HIE. Patients with TSC typically had subependymal calcifications and tubers on neuroimaging along with neurocutaneous stigmata, rest of the patients were either normal or had subtle atrophy on brain scans. Nine (36%) patients exhibited classically psarrhythmia, thirteen (52%) showed modified hypsarrhythmia and 3 (12%) showed other findings on EEG.

Regarding treatment all patients except those with TSC were given prednisolone or combination therapy. TSC patients received Vigabatrin, 3 of those patients responded well while 2 patients had partial response (Table 2). Two patients lost to follow up. Out of 13 patients who were given prednisolone alone, 5 (38%) showed improvement in reduction of spasms, while 4 (30.8%) showed partial improvement (50-80%). Four (38%) patients fail to respond and two of them developed signs of steroid toxicity and prednisolone had to be stopped. Five patients received combination of Prednisolone and Vigabatrin therapy and 3 (60%) patients had >80% improvement. P value is 0.170, which is not statistically significant.

Valproic acid, Clonazepam, Levetiracetam and Topiramate were used as adjunct therapy in study. Patients in study are still in follow up in neurology clinic, apart from seizures these patients also having other problems like delayed speech, aggressive behavior, neuropsychiatric issues and autistic behaviour etc.

Table No.1: Demographic and clinical factors associated with infantile spasms

	Frequency(n)%
Gender	
male	16(64.0%)
female	9(36.0%)
Age at first spasm	
<6months	18(72.0%)
6-10 months	6(24.0%)
>10 months	1(4.0%)
Spasm type	
Flexor	14(56.0%)
Extensor	3(12.0%)
Mixed	8(32.0%)
Aetiology	
Idiopathic	5(20.0%)
Symptomatic	20(80.0%)
Developmental delay	
Normal	6(24.0%)
Delayed	19(76.0%)
Head size	
Microcephaly	14(56.0%)
Normal	11(44.0%)
Pathology	
Hypoxic ischaemic encephalopathy	10(40.0%)
Tuberous Sclerosis	9(36.0%)
Normal	2(8.0%)
Other	4(16.0%)
Neuroimaging	
Brain atrophy	10(40.0%)
Periventricular Leukomalacia	3(12.0%)
Calcification	4(16.0%)
Tubers	2(8.0%)
Other	6(24.0%)
EEG Findings	
Classical Hypsarrhythmia	9(36.0%)
Modified Hypsarrhythmia	13(52.0%)
Other	3(12.0%)

Table No.2: Treatment of infantile spasms with improvement outcome

	Improvement					P value
	>80 (n)%	50-80 (n)%	<50 (n)%	Lost to follow up (n) %	N	
Prednisolone	5(38.5%)	4(30.8%)	4(30.8%)	0(0.0%)	13	0.170
VGB	3(42.9%)	2(28.6%)	0(0.0%)	2(28.6%)	7	
Combination	3(60.0%)	1(20.0%)	1(20.0%)	0(0.0%)	5	

DISCUSSION

This study was descriptive cross sectional study from the neurology clinic of POF hospital and Izzat Ali Shah Hospital. POF hospital is a social security type hospital and is responsible to provide health care facilities to serving/retired POF's employees and families/ parents of the employees. Izzat Ali Shah is a welfare hospital and provide patient care in subsidized rates. Most patients included in the study were the local residents of area. In our study males were more involved than females i.e 64% which was comparable to 63% males in study done by Ibrahim S et al⁷. The reason being, males are given more access to health facility due to socioeconomic factors. Symptomatic infantile spasms was the main classification type found in our study in more than 80% patients while Malik MA et al found 58% symptomatic IS and 42% idiopathic IS⁴. HIE was documented as main pathological feature in our study which was comparable to studies done by Azam M et al (36%) and Ibrahim S (69.4 %) ^{1,7}. Nine (36%) patients exhibited classical hypsarrhythmia comparable to Malik MA (30%)⁴.

Regarding treatment most of our patients given the trial of prednisolone as it was cheap, easily available and relatively better tolerated than ACTH and amongst those 13 patients most of them responded well to steroid therapy. Azam M et al concluded that there was no significant difference between two modes of therapy in a resource depleted country like Pakistan⁷. Initially, it was thought that prednisone was as effective as ACTH^{8,9}. More recently, it has been shown that ACTH is superior to 2 mg/kg/day prednisone and high dose is no better than low-dose ACTH¹⁰. The 2 mg/kg/day dose of prednisone has been suggested to be too low in the Cochrane review¹¹, though they are not satisfied with overall quality of RCTs done so far as sample is small and methodology is poor¹². ACTH is expensive, given parenterally and may be difficult to obtain in some countries: synthetic ACTH (tetracosactide) is beginning to replace the natural product. Prednisolone, on the other hand, is inexpensive, given orally and is easily available.¹ Vigabatrin is specifically effective in treatment of infantile spasms in patients with Tuberous sclerosis complex (TSC), but unfortunately, reports of serious visual field defects have led to a significant reduction in the use of the drug¹³. According to Harekar¹⁴ and Mackay¹⁵, ACTH was found to be the most effective treatment. However, in view of the cost of ACTH, Harekar suggested oral prednisolone either alone or as a follow-up after termination of ACTH therapy¹⁴. In our study we conclude that VGB is effective medication in patients with TSC which is comparable to studies done by Parisi P et al¹³ and others^{16,17}. A famous UKISS study also found prednisolone and tetracosactide being more effective in controlling infantile spasms as compared to Vigabatrin

at young age¹⁸. More over these hormones can be choice of treatment after failure of Vigabatrin therapy¹⁹. Steroids are not as effective after 12 months of age²⁰. In our study we tried combination therapy, where high dose prednisolone was given for 2 weeks and then Vigabatrin was added and later prednisolone was tapered off. More than 50% improvement was seen in 80% of the patients which is better than prednisolone alone (69%). There is no comparative study available. Further work on combination therapy with bigger sample size needs to be done.

CONCLUSION

Infantile spasms are more prevalent in males and Hypoxic ischemic encephalopathy is the major cause. Most of the children exhibit developmental delay. Steroids are preferred mode of therapy however more trials are required with ACTH therapy in our patients as its being internationally recommended. VGB is effective treatment in patients with TSC. Combination of Prednisolone and Vigabatrin is an effective mode of therapy in most cases of Infantile spasms. Further studies are required with bigger sample size.

Author's Contribution:

Concept & Design of Study:	Tahir Mahmood, Shahzad Haider
Drafting:	Tahir Mahmood, Shahzad Haider
Data Analysis:	Shahzad Haider
Revisiting Critically:	Sohail Ashraf
Final Approval of version:	Tahir Mahmood, Shahzad Haider

Acknowledgement: Sana Shabbir

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Azam M, Bhatti N, Krishin J. Use of ACTH and prednisolone in infantile spasms: Experience from a developing country. *Seizure* 2005;14:552-556.
2. Kaushik SJ, Patra B, Sharna S, Yadav D, Aneja S. Clinical spectrum and treatment outcome of West Syndrome in children from Northern India. *Seizure* 2013;22:617-621.
3. Ibrahim S, Gulab S, Ishaque S and Saleem T. Clinical profile and treatment of infantile spasms using vigabatrin and ACTH - a developing country perspective. *BMC Pediatr* 2010;10:1
4. Watanabe K. West syndrome: etiological and prognostic aspects. *brain dev. JPN* 1998;20(1):1-8.
5. Pavone P, Striano P, Falsaperla R, et al. Infantile spasms syndrome, West syndrome and related phenotypes: what we know in 2013. *Brain Dev* 2014;36(9):739-51.
6. Malik MA, Tarrar MA, Qureshi AO. Clinical Spectrum of Infantile Spasm at Presentation. *JCPSP* 2012;22(1):31-34.
7. Harding GFA, Spencer EL, Wild JM, Conway M, Bohn RL. Field specific visual-evoked potentials. Identifying field defects in viga batrin treated children. *Neurol* 2002;58:1261-5.
8. Hrachovy RA, Frost JD, Kellaway P, Zion TE. Double-blind study of ACTH VS prednisone therapy in infantile spasms. *J Pediatr* 1983; 103:641-5.
9. Glaze GG, Hrachovy RA, Frost DJ, Kellaway P, Zion TE. Prospective study of outcome of infants with infantile spasms treated during controlled studies of ACTH and prednisone. *J Pediatr* 1988; 112:389-96.
10. Baram TZ, Mitchell WG, Tournay A, Snead OC, Hanson RA, Horton EJ. High-dose corticotropin versus prednisone for infantile spasms: a prospective, randomized, blinded study. *Pediatr* 1996;97:375-9.
11. Hancock E, Osborne JP, Milner P. The treatment of West syndrome: a Cochrane review of the literature to December. *Brain Dev* 2001;23:624-34.
12. Hancock EC, Osborne JP, Edwards SW. Treatment of Infantile Spasms. *Cochrane Database Syst Rev* 2013;(6).
13. Parisi P, Bombardieri R, Curatolo P. Current role of vigabatrin in infantile spasms. *Eur J Paediatr Neuro* 2007;11(6):331-336.
14. Herekar A. Local experience of management of infantile spasms and its treatment: A retrospective study of ten cases. *Pak J Med Sci* 2010;26(3): 684-687
15. Mackay MT, Weiss SK, Adams-Webber T, et al. Practice Parameter: Medical Treatment of Infantile Spasms. *Neurol* 2004;62:1668-1681
16. Paolo C, Bombardieri R, Caterina C, Current management for epilepsy in tuberous sclerosis complex. *Curropinneuro* 2006;19(2):119-123.
17. Desguerre I, Nabbout R & Dulac O. The management of infantile spasms. *Arch Dis Child* 2008;93(6).
18. Lux AL, Edward SW, Hancock E, et al. The United Kingdom Infantile Spasms Study (UKISS) comparing hormone treatment with vigabatrin on developmental and epilepsy outcomes to age 14 months: a multicenter randomised trial. *Lancet Neurol* 2005;4:712-17.
19. Jones K, Snead OC, Boyd J, Go C. Adrenocorticotrophic hormone versus prednisolone in the treatment of infantile spasms post vigabatrin failure. *J Child Neurol* 2015;30(5):595-600
20. Lux AL, Edward SW, Hancock E, et al. The United Kingdom Infantile Spasms Study comparing vigabatrin with prednisolone or tetracosactide at 14 days: a multicentre, randomised controlled trial. *Lancet* 2004;364:1773-78.

Current Trends of Empirical Treatment of Typhoid Fever among General Practitioners in District Kohat, Khyber Pakhtunkhwa, Pakistan

Current Trends of
Empirical Treatment of
Typhoid Fever

Muhammad Ashraf¹, Niamat ullah³, Gulmaizar Khan¹ and Sohail Aziz Paracha²

ABSTRACT

Objective: To determine the current trends of empirical treatment of typhoid fever among General Practitioners (GPs) in district Kohat, Khyber Pakhtunkhwa, Pakistan.

Study Design: Prospective questionnaire-based cross sectional study.

Place and Duration of Study: This study was conducted at the hospitals i.e. District Headquarter Hospital, KDA, Kohat and Liaquat Memorial Hospital, Kohat from November 2017 to April 2018.

Materials and Methods: Well-designed and structured questionnaires were distributed amongst 100 general practitioners who gave consent to participate in the study. They were briefed about the study and were requested to fill the questionnaires by responding to the questions in predetermined order. The questionnaires were collected by one of the authors and results were analyzed.

Results: Eighty five percent of the GPs diagnosed typhoid fever clinically, without taking any help from laboratory investigations. Eighty percent of the GPs prescribed empirical antibiotic treatment for typhoid fever and only 3% advised blood culture for diagnosis. The most common antibiotics prescribed by GPs as empirical treatment were flouroquinolones in 30 %, cefixime in 42% and ceftriaxone in 14 % of cases. Seventy five percent of GPs prescribed empirical treatment for 11-14 days duration. Combination of antibiotics was prescribed by 40 % of GPs.

Conclusion: Empirical treatment is commonly prescribed by GPs in the treatment of typhoid fever and Cefixime, flouroquinolones and ceftriaxone are most frequently prescribed antibiotics in our set up.

Key Words: General practitioner, Infectious disease, Empirical treatment, Typhoid fever

Citation of articles: Ashraf M, Niamatullah, Khan G, Paracha SA. Current Trends of Empirical Treatment of Typhoid Fever Among General Practitioners in District Kohat, Khyber Pakhtunkhwa, Pakistan. Med Forum 2018;29(9):10-13.

INTRODUCTION

Typhoid fever is one of the commonest infectious diseases in tropical countries¹. Worldwide, approximately 13-17 million cases are reported every year with 600,000 deaths per annum. Eighty percent of reported typhoid fever cases with subsequent deaths belong to Asia alone². Most of the cases of typhoid (enteric fever) are caused by *Salmonella enterica* subsp. *enterica* serovar Typhi (S.Typhi). Although *S. Paratyphi A* and *B* and occasionally other serotypes (such as, *S. Dublin*, *S. Newport* and *S. Virchow* are also culprits. *S. Typhi* is the only human pathogen having no animal reservoir.

However, typhoid fever is a rare imported infection in western communities^{3, 4} while in developing countries like Pakistan where clean water provision, environmental hygiene and food cleanliness are not ideal, typhoid is still a main health issue. The global incidence of typhoid in 1985 was estimated to be 12.5 million cases per annum leading to over 0.3 million deaths subsequently⁵. The significance of better sanitation was well demonstrated in Singapore in 1980 where the incidence of typhoid steadily decreased from there 10/100, 000 population in the 1950s to 1/100,000 in the 1980s⁶.

Contrarily, in developing countries much dependence is upon chemotherapy because of the problems in adopting preventive steps like public health measures or immunization. The death rate of untreated typhoid has been reported approximately 30%, while with use of proper antibiotics it is <1%.

Commonly used antibiotics for typhoid fever in developing countries are ampicillin, chloramphenicol and co-trimoxazole but unfortunately *S. Typhi* is resistant to all⁷. The emergence of resistance to multiple anti typhoid drugs has excessive repercussions as far as typhoid treatment is concerned⁸ such as kids having such strains are more sick, have extended duration of

¹. Department of Pharmacology / Anatomy², Khyber Medical University Institute of Medical Sciences, Kohat.

³. Department of Pharmacology, Khyber Medical College, Peshawar.

Correspondence: Dr. Muhammad Ashraf, Associate Professor Pharmacology, Khyber Medical University Institute of Medical Sciences, (KMU-IMS), Kohat.

Contact No: 0300-9865575

Email: amcollian_tbk@hotmail.com

ailment and show a considerably higher death rate⁹. Nevertheless, there are no distinguishing pathognomonic manifestations to such resistant infections from those which completely sensitive to *S. Typhi*. The available treatment choices for typhoid fever include fluoroquinolones like ofloxacin or ciprofloxacin^{8,10,11,12} and expanded-spectrum cephalosporin such as Ceftriaxone¹². In Pakistan, *S. typhi* multi-drug resistant strains were reported for the first time in 1987¹³ and an increased prevalence (approximately 90%) of *S. Typhi* isolates was observed^{10,14}.

Majority of suspected typhoid fever cases are treated by general practitioners (GPs) by prescribing empirical treatment without a confirmatory test of blood culture and sensitivity and there is an increasing incidence of multi-drug resistance typhoid fever in Pakistan. So an appropriate and effective empirical treatment should be prescribed to cover multi-drug resistant typhoid fever. Therefore, we conducted a questionnaire-based prospective cross sectional study to determine the current trends of empirical treatment of typhoid fever by general practitioners in the hospitals and clinics of district Kohat, Khyber Pakhtunkhwa, Pakistan. It is expected that this survey will help the health professionals to develop an effective protocol of empirical treatment of typhoid fever in order to avoid treatment failures.

MATERIALS AND METHODS

This prospective questionnaire-based cross sectional study was carried out in hospitals and clinics of Kohat district, Khyber Pakhtunkhwa, Pakistan from November 2017 to April 2018. GPs who were full-time registered practitioners, who belonged to urban areas of district Kohat, showed their willingness to participate in the study and were treating cases of typhoid fever irrespective of its duration and age of patient, were included in study. The house officers, specialists and GPs working in rural areas, who were treating typhoid fever were excluded from the study. Convenient sampling technique was used for collection of data. Well-designed and structured questionnaires were prepared and distributed amongst 100 general practitioners who gave informed consent to participate in the study. They were briefed about the study and questionnaires in person by one of the authors and any ambiguity was clarified. They were requested to fill the questionnaires by responding to the questions in predetermined order as per their current practice without any influence. The questionnaires were collected by one the authors and results were manually checked before computerized analysis of the empirical treatment of typhoid fever. The results of the data were recorded as percentages.

RESULTS

Total of 85% of the GPs diagnosed typhoid fever clinically, without taking any help from laboratory investigations. Eighty percent of the GPs prescribed empirical antibiotic treatment for typhoid fever and only 3% advised blood culture for diagnosis. (Table I).

Table No.I: Response of GPs regarding empirical treatment of typhoid fever

Sr. #	Question	Yes %	No %	Occasionally %
1	Do you diagnose typhoid fever solely on clinical basis?	85	5	10
2	Do you prescribe antibiotics as empirical treatment of typhoid fever?	80	5	15
3	Do you advise blood culture & sensitivity test to diagnose typhoid fever?	0	97	3

Table No.2: Response of the GPs about the trend of empirical antibiotics to treat typhoid fever

Question 1	Which antibiotic you prescribe as first choice as empirical treatment for typhoid fever patients?
Responses	a. Flouroquinolones (30 %) b. Cefixime (42 %) c. Azithromycine (4 %) d. Ceftriaxone (14 %) e. Chloramphenicol (1 %) f. Amoxicillin (2 %) g. Sulphamethoxazole-Trimethprim (3 %) h. Others (4 %)
Question 2	For how many days you prescribe antibiotics as empirical treatment of typhoid fever?
Responses	a. 1-6 days (2 %) b. 7-10 days (20 %) c. 10-14 days (75 %) d. More than 14 days (3 %)
Question 3	Do you prescribe antibiotics combination in typhoid fever?
Responses	Yes (40 %) No (60 %)
Question 4	If yes, which combination?
Responses	a. Cefixime + Quinolones (26 %) b. Quinolones+Azithromycin (12 %)

The antibiotics prescribed by general practitioners as empirical treatment were fluoroquinolones 30%, cefixime 42%, azithromycin 4 %, ceftriaxone 14%, chloramphenicol 1%, amoxycillin 2%, sulphamethoxazole + trimethoprim 3 % and others 4 %. The duration of empirical treatment prescribed was 1-6 days 2 %, 7-10 days 20 %, 11-14 days 75 % and more than 14 days 3%. Combination of antibiotics was prescribed by 40 % of general practitioners in which 26 % was cefixime + quinolones and in 12 % it was quinolones + azithromycin (Table 2).

DISCUSSION

Typhoid fever is common systemic infectious disease in South Asia including Pakistan. The clinical features and severity of typhoid fever differ in various age groups along with geography. Most cases of typhoid fever belong to age group ranging from 5 to 25 years^{15, 16, 17}. But, it has been observed in typhoid endemic areas that numerous patients (predominantly children) manifest as suffering from “non-specific fever”, which at the end are proved to be wrong leading to fatal outcomes often^{18, 19, 20}.

The antimicrobial resistance is a serious worldwide issue nowadays and it has perpetually been produced due to extensive use of antibiotics²¹. Additionally, injudicious use of broad spectrum antibiotics due to their low cost, easy administration as empiric treatment of suspected typhoid cases and multiple courses of antibiotic therapy. So judicious use of antibiotics for typhoid fever will help to reduce the antimicrobial resistance and will have favorable effect on patient centered outcome and health related expenditures. It is becoming challenging task to treat typhoid fever due to emerging resistant strains of *S. Typhi*. There is lack of availability and affordability of confirmatory tests like blood culture and sensitivity in these poor countries so the disease is commonly treated by GPs with Empirical antibiotic treatment. Although, culture of bone marrow is the gold standard diagnostic tool¹⁸ but blood culture is commonly practiced as first choice test for patients with typhoid fever. However, most cases of enteric fever are seen in low-income countries where blood cultures are frequently unavailable, too expensive, or incoherently applied¹⁹. Hence due to these limitations in low-income countries with limited diagnostic resources, antibiotics are prescribed empirically in suspected cases of typhoid fever. Antimicrobial resistance in enteric fever is another major health concern which made the treatment of typhoid fever a great challenge. Furthermore, timely treatment with suitable antibiotics is vital for reduction of enteric fever associated mortality²⁰.

World Health Organization (WHO) guidelines recommended fluoroquinolones (ciprofloxacin & Ofloxacin) and 3rd & 4th generation cephalosporin antibiotics as first-line antimicrobial agents for

treatment of typhoid fever²². There are no clear-cut guidelines for the prescription for usage of single and multiple antibiotics for the treatment of typhoid fever. Combination of antibiotic treatment can be considered when single drug treatment fails. Usually, a fluoroquinolone is the drug of first choice. If there is inadequate response, then cefixime, a 3rd generation oral cephalosporin, is added. If there is no improvement in the condition of patient, then Cefixime is replaced by azithromycin²².

In our study 85% of the GPs diagnosed typhoid fever clinically, without advising any investigations and eighty percent of them prescribed empirical treatment of typhoid fever. Most common prescribed antibiotics were cefixime (42%), fluoroquinolones (30 %) ceftriaxone (14 %) and azithromycin (4 %). These antibiotics were prescribed for 10-14 days duration by majority of GPs (75%). Prescription of combination of two antibiotics was also observed in 40 % of GPs in our study and most common combination was quinolones & Cefixime. A study on knowledge, attitude and practice of general practitioners (GP) regarding treatment of typhoid fever by Paul et al in 2016 revealed that the antibiotics used by GPs for treatment of typhoid are: Azithromycin (42%), Fluoroquinolones (32%), Cefixime (16%), Amoxycillin (6%) and Chloramphenicol (4%). A combination of antibiotics is preferred by 38% of GPs and the preferred combinations of antibiotics are Cefixime + Azithromycin (26%) and Ciprofloxacin + Azithromycin (12%). Parenteral antibiotic is preferred in most cases when the patient is unable to consume orally usually due to excessive vomiting²².

The observations of our study are in accordance with WHO recommendations of first line antibiotics treatment of typhoid fever²¹. The findings of our study regarding empirical antibiotics treatment of typhoid fever are in consistent with similar studies conducted by other researchers in India²² but the main difference is that this study was conducted at different places of India while our study was carried out in one district only.

The limitations of our study are small sample size, non-inclusion of specialists and sampling of convenience type. Moreover, well-designed studies are recommended in order to study the latest trends for typhoid chemotherapy in larger population. Moreover, continued surveillance of resistance rates and antibiotics combinations is desirable to guarantee suitable recommendations for the treatment of typhoid especially in endemic areas.

CONCLUSION

GPs commonly prescribe antibiotics empirically for treatment of typhoid fever without performing confirmatory blood culture test. Most frequently used antibiotics are cefixime, fluoroquinolones and

ceftriaxone. However large scale, well-designed studies highlighting antibiotic susceptibility of *S.typhi* in typhoid fever are recommended to know effective antibiotics in order to avoid treatment failures.

Author's Contribution:

Concept & Design of Study: Muhammad Ashraf
 Drafting: Sohail Aziz Paracha
 Data Analysis: Niamatullah, Gulmaizar Khan
 Revisiting Critically: Muhammad Ashraf, Sohail Aziz Paracha
 Final Approval of version: Muhammad Ashraf

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

- Crump JA, Luby SP, Mintz ED. The global burden of typhoid fever. *Bull World Health Organ* 2004; 82:346-53.
- WHO. Report of the Director General. Geneva: WHO; 1996.
- Ryan CA, Hargrett BNT, Blake PA. Salmonella typhi infections in the United States, 1975-1984: increasing role of foreign travel. *Rev Infect Dis* 1989;11:1-8.
- Mathieu JJ, Henning KJ, Bell E, Frieden TR. Typhoid fever in New York City, 1980 through 1990. *Arch Int Med* 1994;154:1713-1718.
- Edelman R, Levine MM. Summary of an international workshop on typhoid fever. *Rev Infect Dis* 1986;8:329-349.
- Yew FS, Goh KT, Lim YS. Epidemiology of typhoid fever in Singapore. *Epidemiol Infect* 1993; 110: 63-70.
- Smith SM, Palumbo PE, Edelson PJ. Salmonella strains resistant to multiple antibiotics: therapeutic implications. *Pediatr Infect Dis* 1984;3:455-460.
- Rowe B, Ward LR, Threlfall EJ. Spread of multiresistant Salmonella typhi. *Lancet* 1990; 336:1065.
- Bhutta ZA, Naqvi SH, Razzaq RA, Farooqui BJ. Multidrug resistant typhoid in children: presentation and clinical features. *Rev Infect Dis* 1991; 13: 832-836.
- Mirza SH, Beeching NJ, Hart CA. The prevalence and clinical features of multi-drug resistant Salmonella typhi infections in Baluchistan, Pakistan. *Ann Tmp Med Pamsitol* 1995;89:515-519.
- Hien TT, Bethell DB, Hoa NTT, et al. Short course of ofloxacin for treatment of multidrug-resistant typhoid. *Clin Infect Dis* 1995;20:917-923.
- Wallace MR, Yousif AA, Mahroos GA, et al. Ciprofloxacin versus ceftriaxone in the treatment of multiresistant typhoid fever *Eur J Clin Microbiol Infect Dis* 1991;12:907-910.
- Smego RA, Zaidi AK, Mohammed Z, Bhutta ZA, Hafeez S. Multiply-resistant Salmonella and Shigella isolates. *APMIS* 1988;Suppl 3: 65-67.
- Mirza SH, Hart CA. Plasmid encoded multi-drug resistance in Salmonella typhi from Pakistan. *Ann Tmp Med Pamsitol* 1993;87:373-377.
- Osler W. The Principles and Practice of Medicine: Designed for the Use of Practitioners and Students of Medicine. 8th ed. New York: D. Appleton; 1912. p.1-46.
- Stuart BM, Pullen RL. Typhoid; clinical analysis of 360 cases. *Arch Int Med (Chic)* 1946;78:629-61.
- Huckstep RL. Typhoid Fever and Other Salmonella Infections. Edinburgh, Scotland: E. & S Livingstone;1962.
- Gilman RH, Terminel M, Levine MM, Hernandez-Mendoza P, Hornick RB. Relative efficacy of blood, urine, rectal swab, bone-marrow, and rose-spot cultures for recovery of Salmonella Typhi in typhoid fever. *Lancet* 1975;1:1211-3.
- Archibald LK, Reller LB. Clinical microbiology in developing countries. *Emerg Infect Dis* 2001;7: 302-5.
- Edelman R, Levine MM. Summary of an international workshop on typhoid fever. *Rev Infect Dis* 1986;8:329-49.
- Kumar MS, Lakshmi V, Rajagopalan R. Occurrence of extended spectrum beta- lactamases among Enterobacteriaceae spp. isolated at a tertiary care institute. *Ind J Med Microbiol* 2006;24(3): 208-11.
- Upadhyay R, Nadkar MY, Muruganathan A, Tiwaskar M, Amarapurkar D, Banka NH, et al. API recommendations for the management of typhoid fever. *J Assoc Phys Ind* 2015;63:77-96.
- Paul UK, Barik KL, Sinharay K, Banik S, Bandyopadhyay A. Knowledge, Attitude and Practice of General Practitioners Regarding Typhoid Fever. *Int J Sci Stud* 2016; 3(10):83-86.

Effectiveness of Vacuum-Assisted Closure Therapy as a Pretreatment for Split Thickness Skin Grafts

VAC Dressing as a pretreatment of Split Thickness Skin Grafting

Moiz Sadiq¹, Fahad Hanif Khan², Syed Sheeraz ur Rahman³ and Obaid-ur-Rahman²

ABSTRACT

Objective: To assess the effectiveness of vacuum assisted closure (VAC) dressing as a pretreatment of split thickness skin grafting versus routine normal saline dressings.

Study Design: Randomized control study

Place and Duration of Study: This study was conducted at the Department of Plastic and Reconstructive Surgery, Liaquat National Hospital, Karachi from June-December, 2017.

Materials and Methods: All patient fulfilling the inclusion and exclusion criteria were asked for a consent and enrolled in the study. Patient of either sex, age, from 20 – 50 years with traumatic and post-surgical acute wounds (within a week) on upper or lower limbs only, requiring split thickness skin grafting were included in the study. Statistical package for social sciences (SPSS) version 18 was used for data analysis. Chi-square test was used for significant co-relations with 95% confidence interval.

Results: A total of 92 patients with traumatic and post-surgical acute wound requiring split thickness skin grafting were included in this study. Forty six in group A were treated by vacuum assisted closure (VAS) and 46 were treated with normal saline. Effectiveness was significantly higher in group A than group B (80.4% vs. 56.5%; $p=0.014$).

Conclusion: Split-thickness skin grafting provides a simple one-stage reconstructive option for skin and soft tissue defects. The use of VAC therapy is an effective and a safe adjunct to conventional treatment modalities for the management of wound.

Key Words: Vacuum assisted closure, skin grafting, direct closure, wound coverage

Citation of articles: Sadiq M, Khan FH, Rahman SS, Rahman O. Effectiveness of Vacuum-Assisted Closure Therapy as a Pretreatment for Split Thickness Skin Grafts. Med Forum 2018;29(9):14-17.

INTRODUCTION

Wound has been a challenge for healers since ancient times. Usually open wound is managed with repeated dressings and multiple debridements. In complex wounds with soft tissue loss, healing can occur by secondary intention or augmented with grafts or flaps¹. Among this skin grafting has been one of the oldest armamentarium of surgeon for the wounds which cannot be close primarily^{2,3,4}. Wounds with tissue loss if allowed to heal by secondary Intention without skin grafting demonstrate greater degree of contracture and are more prone to hypertrophic scarring³.

Skin graft requires a vascular bed and will seldom take in expose bone, cartilage or tendon devoid of their periosteal, perichondrium or paratenon. The major causes of skin graft loss are the result of the formation

of seroma or hematoma under the graft that interferes directly with the imbibitions and revascularization process, and the infection of the graft that frequently leads to partial or total graft loss^{3,5}. So graft take can be facilitated by different techniques like tie-over bolster dressings, quilting stitch and vacuum assisted closure therapy. Among these, vacuum-assisted closure (VAC) therapy is a new modality of managing open wound. It is an effective and inexpensive treatment for acute and chronic wounds and is being used increasingly in all surgical specialties⁶. The use of vacuum assisted closure therapy in dressing of split skin grafts has been shown to promote healing by a number of mechanisms, including reducing interstitial edema, promoting angiogenesis and by opposing bacterial colonization⁷⁻⁹. Normally, the vacuum assisted closure therapy is recommended for treatment of traumatic wounds, diabetic wounds, pressure and venous ulcers but its use, to minimize interstitial fluid and hematoma before grafting to prevent the graft loss is very limitedly addressed¹⁰. The only study that come across by Sadiq M, et al. showed a significant improvement in graft take (>95%) in patients who were dressed with VAC therapy as compared to 18% of the patients who were dressed with routine dressing (with normal saline) prior to grafting¹. There is lack of literature on this topic as the sample had unequal number of patients in both groups.

¹. Department of Plastic and Reconstructive Surgery / Plastic Surgery² / General Surgery³, Liaquat National Hospital, Karachi.

Correspondence: Fahad Hanif Khan, Resident, Plastic Surgery department, Liaquat National Hospital, Karachi.
Contact No: 0333-3032360
Email: dr.fhkhan@hotmail.com

MATERIALS AND METHODS

This is a randomized control trial conducted at the department of Plastic and Reconstructive surgery, Liaquat National Hospital, Karachi over a period of 6 months from June – December, 2017. Patient of either sex, age, from 20 – 50 years with traumatic and post-surgical acute wounds (within a week) on upper or lower limbs only, requiring split thickness skin grafting were included in the study. The following patients were excluded from selection

1. Deep wounds with exposed bone, neuro-vascular structure or tendon
2. Wounds with positive bacterial culture and sensitivity prior to grafting.
3. Patient with co-morbidities.
4. Patient with impair wound healing (e.g. chemotherapy, corticosteroids, or local irradiation therapy).
5. Wounds involving joints (due to difficulty in VAC dressing application).

Informed and written consent was taken. The patients were randomly allocated in two groups (Group A and B) using lottery method. In Group A, 46 patients were applied Vacuum Assisted Closure (VAC) dressing 10 days prior to split thickness grafting. The VAC sponge was cut to match the contour of the wound and then secured to the surrounding skin using an adherent, occlusive dressing. The VAC dressing was placed at continuous -125 mm Hg pressure. VAC dressing was changed on every third day for ten days. In Group B, 46 patients were dressed daily with the routine 0.9% normal saline soaked gauze. The dressings in both groups were removed after 10 days. The length and width of the wound was measured with a ruler for the area of wound prior to grafting. Split thickness skin grafting was done using Watson knife, which was meshed using a Derma carrier of 1x1.5. The STSG was secured to the recipient site using circumferential staples, followed by placement of a non-adherent paraffin gauze dressing. During the postoperative period, attempts were made to keep the affected area immobilized by bed rest or a splint. The graft was checked at 5th post-operative day and the wound was evaluated by using a ruler for grafted area [Length (cm) × breadth (cm) = area (cm²)]. The percentage of grafted area was taken by dividing the grafted area by the total wound area multiplying by 100 [Grafted area percentage: grafted area cm² / wound area cm² × 100]. Assessment of graft take was done by a single consultant surgeon and only ≥ 95% of graft take was considered as “effective”. All data will be collected in pre designed proforma by principle investigator. To minimize bias all patients were managed by a senior investigator for grafting, who was unaware of the study group of the patients.

Statistical package for social sciences (SPSS) version 18 was used for data analysis. Chi-square test was used for significant co-relations with 95% confidence interval.

RESULTS

Ninety two patients with traumatic and post-surgical acute wounds requiring split thickness skin grafting were included in this study. Patients were randomly allocated into two groups. Forty six patients in group A were treated by vacuum assisted closure (VAS) and 46 were treated with normal saline. In both groups, 31 to 40 years of age patients were commonly. The average age of the patients was 37.14 ± 6.76 years (table I). Out of 92 patients, 40(43.5%) were male and 52(56.5%) were female, with 25 (54.3%) males in group A as compared to 15 (34.6%) in group B, while 21 (45.6%) females in group A versus 31 (67.3%) in group B. Regarding etiology of wound, trauma was observed in 33 (35.9%) cases and post surgical defect was observed in 59 (64.1%) patients (figure I). Fifty four (31 in group A vs 23 in group B) patients had wounds on upper limb as compared to 38 (15 vs 23 in group A and B, respectively) on lower limbs.

Table No.I: Characteristics of patients with respect to groups (n=92)

Variables	Group A (VAC Dressing) (n=46)	Group B (Normal Saline) (n=46)	Mean ± SD
Age (years)	35.85 ± 6.73	38.43 ± 6.62	37.14 ± 6.76
Size of Wound (cm)	19.33 ± 5.59	19.37 ± 4.45	19.35 ± 5.03
Duration of wound (days)	4.76 ± 1.33	4.57 ± 1.39	4.66 ± 1.43

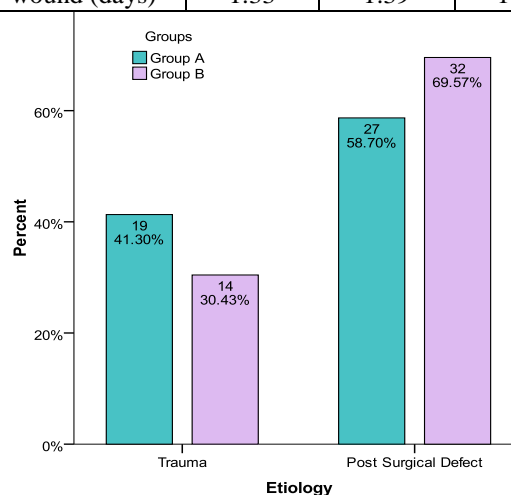


Figure No.I: Etiology of the patients with respect to groups (n= 92)

Table No.2: Effectiveness of group A versus group B (n= 92).

Graft take $\geq 95\%$	Group A (VAC Dressing) (n= 46)	Group B (Normal Saline) (n=46)	Total (n= 92)	P- Value*
Yes	37 (80.4%)	26 (56.5%)	63 (68.5%)	0.014
No	9 (19.6%)	20(43.5%)	29 (31.5%)	

*Chi-Square test

Effectiveness was defined as graft take $\geq 95\%$ of the surface area, which was significantly higher in group A than group B (80.4% vs. 56.5%; p-value: 0.014) as shown in table II. Effectiveness was significant for vacuum dressings in those cases whose duration of wound was 1-4 days ($p=0.036$), wounds after previous surgery (p-value: 0.039) and was irrespective to the size of wound (P-value: 0.02). No significant difference was observed between groups for lower and upper limbs (p-value: 0.80).

DISCUSSION

Vacuum-assisted closure (VAC) therapy is a new modality of managing open wounds which is taking its place as an effective and inexpensive treatment for acute and chronic wounds and is being used increasingly in all surgical specialties¹¹.

In this present study the mean age of the patients was 37.14 ± 6.76 years. Out of 92 patients, 40 (43.5%) were male and 52 (56.5%) were female. In a study by Saaiq et al¹ in 100 patients, 86 (86%) were males. The age ranged from 13-65 years, with a mean of 33.07 ± 13.60 years.

A number of adjuvant therapies such as use of skin substitutes, growth factors and hyperbaric oxygen have been employed to expedite wound healing. VAC therapy was found as a better alternative in this regard as it is more economical and safer¹². The present findings are in conformity with those of other published studies¹²⁻¹⁴. We observed graft take of $>95\%$ if vacuum assisted closure (VAC) dressing was used as a pretreatment for wounds requiring split thickness skin grafting versus routine normal saline dressing. The effectiveness was significantly high in group A than group B (80.4% vs. 56.5%; p-value: 0.014). Several published studies have successfully used VAC dressings for securing skin grafts postoperatively, especially in wounds with exudative, irregular, or mobile recipient beds and in difficult anatomic locations. It has been reported to stabilize the skin graft and conform it well to the shape of recipient bed, remove edema fluid, decrease bacterial counts, and provide a secured dressing. All these factors further improve the graft survival and reduce the need for repeat skin grafting¹⁵⁻¹⁷.

Effectiveness was significant between groups in those cases whose duration of wound was 1 to 4 days ($p=0.036$) and in post-surgical wounds ($p=0.039$). Other published studies have also shown fast healing with VAC therapy¹⁸⁻²⁰. A variety of factors have been described to account for the accelerated healing. VAC therapy decontaminates the wound and removes surface off exudates, which contain large amounts of proteases. Fluid removal helps with localized edema that otherwise cause an increase in interstitial pressure with consequent occlusion of microvasculature and lymphatics, decreased nutrient, and oxygen delivery⁽¹⁸⁾. Protein degradation enzyme is released with metabolic waste accumulation and increased bacterial colonization, which causes capillary damage and hypoxia. Vacuum therapy also provides a moist environment for granulation tissue formation, which allows for faster re-epithelialization of the wound surface. Angiogenesis is stimulated, which improves tissue oxygenation and tissue reconstruction^{21,22}. Micromechanical forces exerted on wound surface by low pressure suction are also important. This mechanism mimics the stretch-induced cell proliferation typically operative in tissue expansion phenomenon seen elsewhere in the body^{23, 24}. Split-thickness skin grafting is simple to perform and has a low morbidity. Owing to its low cost, VAC therapy can provide an economical alternative to the other available costly local wound management measures. Such economic implications of wound management are particularly important in the context of our poor patients. Cost effectiveness has also been reported in terms of shortened hospital stays, and decreased overall medical cost in the published literature^{25,26}.

CONCLUSION

Split-thickness skin grafting (STSG) provides a simple one-stage reconstructive option for skin and soft tissue defects. The use of VAC therapy is an effective and safe adjunct to conventional and established treatment modalities for the management of wound infection. VAC therapy should be employed in the pre-treatment of wounds planned to be reconstructed with STSG, given its significant advantages in the wound bed preparation compared with traditional normal saline gauze dressings.

Author's Contribution:

Concept & Design of Study:	Moiz Sadiq
Drafting:	Moiz Sadiq, Syed Sheeraz ur Rahman
Data Analysis:	Fahad Hanif Khan, Obaid-ur-Rahman
Revisiting Critically:	Moiz Sadiq, Syed Sheeraz ur Rahman
Final Approval of version:	Moiz Sadiq

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Saaiq M, Uddin H, Khan MI, Chaudhery SM. Vacuum-assisted closure therapy as a pretreatment for split thickness skin grafts. *J Coll Physician Surg Pak* 2010;20(10):675-79.
2. Memon AS, Shaikh NA, Samo KA, Awan A. Split thickness skin grafting for wounds in a general surgical setting: our experience. *Med Channel* 2007;13(1):15-17.
3. Thorne CH, Mustore TA, Grabb and Smith's plastic surgery. *Techniques and principle in plastic Surg* 2007;6:3-14.
4. Akhavani MA, Mckinnell T, Kang NV. Quilting of full thickness grafts in the hand. *J Plast Reconstr Aesthet Surg* 2010;63:1534-37.
5. Llanos S, Danilla S, Barraza C, Armijo E, Piñeros JL, Quintas M, et al. Effectiveness of Negative Pressure Closure in the Integration of Split Thickness Skin Grafts. A Randomized, Double-Masked, Controlled Trial. *Ann Surg* 2006;244(5): 700-05.
6. Shrestha BM, Nathan VC, Delbridge MS, Parker K, Throssell D, McKane WS, et al. Vacuum-assisted closure (VAC) therapy in the management of wound infection following renal transplantation. *Kathmandu Uni Med J* 2007;5(17):4-7
7. Rozen WM, Shahbaz S, Morsi A. An improved alternative to vacuum-assisted closure (VAC) as a negative pressure dressing in lower limb split skin grafting: a clinical trial. *J Plast Reconstr Aesthet Surg* 2008; 61(3): 334-7.
8. Körber A, Franckson T, Grabbe S, Dissemond J. Vacuum assisted closure device improves the take of mesh grafts in chronic leg ulcer patients. *Dermatol* 2008;216(3):250-6.
9. Hanasono MM, Skoracki RJ. Securing skin grafts to microvascular free flaps using the vacuum-assisted closure (VAC) device. *Ann Plast Surg* 2007;58(5):573-6
10. Nather A, Hong NY, Lin WK, et al. Effectiveness of bridge V.A.C. dressings in the treatment of diabetic foot ulcers. *Diabetic Foot & Ankle*. 2011;2:5893-96.
11. Argenta LC, Morykwas MJ, Marks MW. Vacuum-assisted closure: state of clinic art. *Plast Reconstr Surg* 2006;117(7 Suppl):127S-142S.
12. Wong LK, Nesbit RD, Turner LA, Sargent LA. Management of a circumferential lower extremity degloving injury with the use of vacuum-assisted closure. *South Med J* 2006;99:628-30.
13. Andrews BT, Smith RB, Goldstein DP, Funk GF. Management of complicated head and neck wounds with vacuum-assisted closure system. *Head Neck* 2006;28:974-81.
14. Armstrong DG, Lavery LA. Diabetic foot study consortium. Negative pressure wound therapy after partial diabetic foot amputation: a multicentre, randomised controlled trial. *Lancet* 2005;366: 1704-10.
15. Scherer LA, Shiver S, Chang M. The vacuum assisted closure device: a method of securing skin grafts and improving graft survival. *Arch Surg* 2002;137:930-3.
16. Hallberg H, Holmstrom H. Vaginal construction with skin grafts and vacuum-assisted closure. *Scand J Plast Reconstr Surg Hand Surg* 2003;37: 97-101.
17. Molnar JA, De Franzo AJ, Marks MW. Single-stage approach to skin grafting the exposed skull. *Plast Reconstr Surg* 2000;105:174-7.
18. Braakenburg A, Obdeijin MC, Feitz R, van Rooij IA, van Griethuysen AJ, Klinkenbijn JH, et al. The clinical efficacy and cost effectiveness of the vacuum-assisted closure technique in the management of acute and chronic wounds: a randomized controlled trial. *Plast Reconstr Surg* 2006;118:390-7.
19. Vuerstaek JD, Vainas T, Wuite J, Nelemans P, Neumann MH, Veraart JC. State-of-the-art treatment of chronic leg ulcers: a randomized controlled trial comparing vacuum-assisted closure (VAC) with modern wound dressings. *J Vasc Surg* 2006;44: 1029-37.
20. Timmers MS, Le Cessie S, Banwell P, Jukema GN. The effects of varying degrees of pressure delivered by negative-pressure wound therapy on skin perfusion. *Ann Plast Surg* 2005;55:665-71.
21. Morris GS, Brueilly KE, Hanzelka H. Negative pressure wound therapy achieved by vacuum-assisted closure: evaluating the assumptions. *Ostomy Wound Manage* 2007;53:52-7.
22. Demaria RG, Giovannini UM, Téot L, Frapier JM, Albat B. Topical negative pressure therapy. A very useful new method to treat severe infected vascular approaches in the groin. *J Cardiovasc Surg (Torino)* 2003;44:757-61.
23. Saxena V, Hwang CW, Huang S, Eichbaum Q, Ingber D, Orgill DP. Vacuum-assisted closure: micro-deformations of wounds and cell proliferation. *Plast Reconstr Surg* 2004;114: 1086-98.
24. De Filippo RE, Atala A. Stretch and growth: the molecular and physiologic influences of tissue expansion. *Plast Reconstr Surg* 2002;109:2450-62.
25. Trueman P. Health economics and topical negative pressure therapy. In: Calne S, editor. Position document. Denmark: European Wound Management Association 2007;5-9.
26. Jones SM, Banwell PE, Shakespeare PG. Advances in wound healing: topical negative pressure therapy. *Postgrad Med J* 2005;81:353-7.

Obstructive Sleep Apnea and Blood Pressure: A Cross Sectional Study in Our Local Population

Ambreen Qamar¹, Hafiz Syed Imran-ul-Haq², Rashid Ahmed³ and Afsheen Qamar⁴

ABSTRACT

Objective: To evaluate the association of obstructive sleep apnea with blood pressure in our local population.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Sleep Laboratory, Polysomnography Dept., Dow University Hospital, Karachi from December 2013 to June 2015.

Materials and Methods: Total 100 subjects were evaluated for study, in which 50 were OSA cases while 50 were control subjects. All subjects were went through informed consent, detailed history, physical examination and ESS score calculation. OSA subjects were examined by overnight polysomnography to confirm diagnosis of OSA and to divide them into groups according to severity of OSA. Systolic and Diastolic blood pressure were evaluated and analyzed by using SPSS version 20.

Results: Mean systolic blood pressure (mm Hg) was significantly higher in cases as compared to the controls (138.60 ± 14.07 vs 129.40 ± 14.93) ($p < 0.002$). Frequency of persons with high blood pressure was 74% in cases and 30% in controls. Frequency of persons with high blood pressure was also associated with severity of apnea as it was 30% in control subjects while it was 58.3%, 76.5% and 81.0% in mild apnea, moderate apnea and severe apnea groups respectively.

Conclusion: Study findings are suggesting that obstructive sleep apnea is associated with higher blood pressure; it is also associated with severity of OSA in our population. Our study is emphasizing the need of improving our understanding regarding the pathophysiology of OSA and its relation with hypertension.

Key Words: Obstructive sleep apnea, sleep, Blood pressure

Citation of articles: Qamar A, Haq HS, Ahmed R, Qamar A. Obstructive Sleep Apnea and Blood Pressure: A Cross Sectional Study in Our Local Population. Med Forum 2018;29(9):18-21.

INTRODUCTION

Proper sleep is necessary for a healthy and active life. Inadequate sleep causes daytime sleepiness which can be an antecedent to falls, declining quality of life, concentration failure, morning headaches, loss of energy, irritability and fatigue. Inadequate sleep is associated with multiple neurological and metabolic abnormalities which can not only effect quality of life but can also shorten life span^{1,2}.

Sleep related respiratory disorders (SRBDs) are a wide group of disorders. Some of them are related to habitual snoring while some are related to partial or complete pause in breathing and decrease oxygen saturation during sleep.

¹. Department of Physiology / Pharmacology², DIMC, DUHS, Karachi.

³. Department of Anatomy, BMC, Baqai Medical University, Karachi.

⁴. Department of Biochemistry, SMC, JSMU. Karachi.

Correspondence: Dr. Ambreen Qamar, Assistant Professor of Physiology, Dow University of Health Sciences, Karachi.

Contact No: 0300-0200277

Email: a_smcian@yahoo.com

Received: February, 2018;

Accepted: July, 2018

Out of all SRBDs, obstructive sleep apnea (OSA) is a condition which required early diagnosis and treatment as it is proven to be related with multiple neurological and metabolic disturbances in the body^{3,4}. OSA is a condition in which there are repeated events of complete or partial upper airway obstruction during sleep, that last for more than 10 seconds, associated with decrease oxygen saturation and excessive day time sleepiness (EDS). Severity of the disorder is characterized by the frequency of apneas and hypopnea episodes per hour of sleep which is termed as Apnea-Hypopnea Index (AHI). OSA is a relatively common sleep disorder which if left untreated leads to significant mental and physical problems⁵.

According to studies OSA is a cause of disruptive snoring, frequent arousals during sleep, excessive daytime sleepiness, impaired work performance, cognitive dysfunction, decreased mental alertness, attention deficit, memory problems, anxiety, displeasure or depression, lack of energy and tiredness, decrease in health related quality of life, gastro-esophageal reflux, obesity, diabetes, stroke and many cardio-vascular disorders^{6,7}.

Events of repetitive respiratory collapse in OSA impose substantial adverse effects on multiple organ systems. Over the past two decades, the pathophysiological

mechanism of OSA has been better understood, but exact contributory pathways are still not clearly described. Studies suggested the involvement of multifactorial mechanism in the association of OSA with metabolic disturbance and cardio-vascular risk in relation to OSA.

According to many studies conducted in multiple countries OSA patients show a strong association with systemic hypertension. Studies have suggested not a single pathway, but rather a combination of mechanisms that could lead to hypertension risk in OSA patients⁴.

Extensive data is available to understand the alteration in autonomic nervous system (ANS) that occur with the transition from wakefulness to sleep, and throughout sleep state dynamics. Blood pressure (B.P) and heart rate (H.R) decreases during deep NREM sleep than when awake due to elevated parasympathetic tone and sympathetic withdrawal. During transitioning phase from NREM sleep to REM sleep, BP and HR increase and become more unstable. In REM sleep there is an increase in sympathetic nervous system activity (SNA) above the levels found during wakefulness. Considering the close relationships between sleep regulatory mechanisms and ANS it is logical to expect that, any sleep disturbance can theoretically lead to alterations in sympathetic activity, and may thus disturb blood pressure regulatory system. Repetitive episodes of intermittent hypoxia (IH) and CO₂ retention can also augment SNA via stimulation of central and peripheral chemoreceptors^{3,8}. The prominent role of hypoxia in promoting an increase in BP in both animal model and human has been demonstrated. Elevated BP found to be associated with increased chemo reflex whereas baroreflex, which is protective for the vascular wall, decreases in OSA⁹.

MATERIALS AND METHODS

Total 100 subjects were evaluated for study, in which 50 were OSA cases while 50 were control subjects. All subjects were went through informed consent, detailed history, physical examination and Epworth sleep scale (ESS) score calculation to evaluate their day time sleepiness and chances of having OSA.

Suspected case subjects were initially scrutinized from sleep clinics. They were with multiple sleep related complains e.g. sleep disturbance, loud snoring, day time sleepiness, frequent arousal from sleep, morning headache etc. ESS score more than 9 indicates day time sleepiness. Suspected OSA subjects were examined by overnight polysomnography to confirm diagnosis of OSA and to divide them into groups according to severity of OSA based on their AHI. As mild (AHI = 5-15), moderate (AHI= 15-30) and (AHI <30)¹⁰. A Polysomnography (PSG) is a comprehensive multi-channel recording of the biophysiological changes that occur during sleep¹¹. Age, gender and BMI matched controls subjects were selected without any sleep related

complain and ESS score less than 9. Systolic and Diastolic blood pressure were evaluated and analyzed by using SPSS version 20. Subjects with BP \geq 130/85 mmHg or already on hypertensive medicines were considered with high blood pressure.

RESULTS

The research sample comprised of 100 individuals, 50 each with and without OSA, the latter served as controls. Mean age and BMI was not significantly different in both groups. The mean AHI for cases was 32.795 ± 22.70 while it was assumed as Zero for controls.

Mean systolic blood pressure (mm Hg) was significantly higher in cases as compared to the controls (138.60 ± 14.07 vs 129.40 ± 14.93) ($p < 0.002$). Although diastolic blood pressure was also higher in OSA group as compared to controls (85.84 ± 13.83 vs 80.90 ± 14.20) but the difference in diastolic blood pressure was not statistically significant ($p < 0.081$) in both groups. The data is shown in table 1.

Hypertension was found to be significantly ($p < 0.000$) more common in patients with OSA than in controls (table 2).

Table No.1: Comparison of mean blood pressure among subjects with and without Obstructive Sleep Apnea

Mean Blood pressure	Controls	Cases	p-value
Systolic Blood Pressure (mmHg)	129.40 (125.16-133.64)	138.60 (134.60-140.60)	0.002*
Diastolic Blood Pressure (mmHg)	80.90 (76.86-84.94)	85.84 (81.91-89.77)	0.081

*Statistically significant difference, p-values generated by t-test

Table No.2: Frequency Distribution of Normal and High blood pressure Subjects in Cases and Control (n=100)

Categories with normal and high B.P	Control n (%)	Case n (%)	P Value
Normal BP/No Anti-hypertensive medicine	35 (70%)	13 (26%)	.000*
High BP /Anti-hypertensive medicine	15 (30%)	37 (74%)	

*Statistically significant difference, p-values generated by t-test

The % of subjects who were not the diagnosed cases of hypertension and were not on antihypertensive medicine but with normal blood pressure was 26% (n=13) in cases whereas they were 70 % (n=35) in controls. Likewise the % of subjects with diagnosed hypertension or with high blood pressure was 74% (n=37) in cases and 30% (n=15) in controls. The data

documents that % population of OSA group with high blood pressure was almost double as compared to the controls.

Hypertension was also found to be associated with the severity of apnea; increase in the severity of apnea, increases % of population with high blood pressure. It was 30% in control subjects while it was 58.3%, 76.5% and 81.0% in mild apnea, moderate apnea and severe apnea groups respectively (Table:3) (Figure.1)

Table No.3: Number and percentage of subjects in mild, moderate and severe OSA groups with normal and high blood pressure

Categories with normal and high B.P	OSA CASES			Total In Case group
	Mild Apnea (AHI=5-15) n(%)	Moderate Apnea (AHI=15-30) n(%)	Severe Apnea (AHI >30) n(%)	
Normal B.P /No Antihypertensive Medicine	5 (41.7%)	4 (23.5%)	4 (19%)	13 (26%)
High BP /Anti-hypertensive Medicine	7 (58.3%)	13 (76.5%)	17 (81%)	37 (74%)
Total	12 (100%)	17 (100%)	21 (100%)	50 (100%)

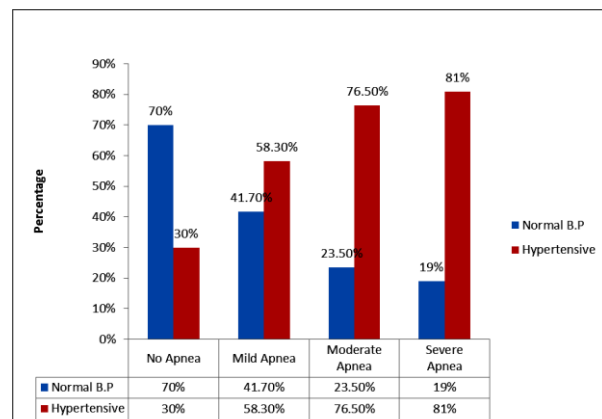


Figure No.1: Association of blood pressure with severity of apnea

DISCUSSION

Our study is in line with previous studies showed increase frequency of hypertension in OSA patients as compare to controls. We have included equal number of male and female participants in both groups. They were matched with age as well as with their BMI, so any chance of biasness in our results due to age, gender or BMI was eliminated.

According to studies Sleep heart health studies (SHHS) has described OSA as an important and self-sufficient causative factor for hypertension¹². In present study hypertension was documented with significantly higher frequency in OSA patients and revealed direct relationship between these two, independent of age and obesity. These findings are also support the previous

studies showing strong and direct association of OSA with systemic hypertension⁴. Some previous studies have shown the prevalence of hypertension to be almost twice in OSA group compared to controls (91.3% vs. 57.1%; $p=0.041$)¹³. In present study mean systolic blood pressure (mm Hg) was much higher in patients with OSA as compared to control (138.60 vs.129) with P value = 0.002. However mean diastolic blood pressure did not reflect statistically significant difference. In the present study significant positive correlation between hypertension and severity of apnea has been documented.

Wisconsin Sleep Cohort Study after four years observation has provided the most compelling data indicating the causative role of apnea in the pathogenesis of hypertension and indicates that an AHI of 15 and more heightened the possibility of having hypertension by 80%¹⁴.

A series of cross-sectional analyses were carried out demonstrating that an increased AHI was related to high chances of having hypertension; and this relationship remained prominent even after correcting for confounding variables like age and obesity. This assumption has been supported by observations from interventional studies, which showed that treatment with CPAP may decrease both systolic and diastolic blood pressures^{15,16}. All these findings support the suggestion that OSA is likely to be a risk factor for hypertension and subsequent cardio vascular morbidity. The present study on Pakistani population thus supports this suggestion. Evidences suggest that OSA could be a modifiable risk in reducing overall prevalence of hypertension in our Pakistani population. Better understanding of OSA and its relationship with hypertension could help to reduce the burden of this disease.

Studies considered OSA as an etiologic factor for the development of hypertension as well as for resistant hypertension. One third of hypertensive population is suffering from OSA⁴. The 'seventh report' issued by "Joint National Committee" has recognized OSA as a significant cause of hypertension¹⁷. Expert panels have recommended that OSA and its treatment should be a part of management of patients with resistant hypertension¹⁸. OSA-mediated sympathetic activation is known to promote the development of resistance hypertension.

The relationship of apnea and hypertension has been reviewed extensively and different factors resulting in hypertension in OSA patients been reported: increased sympathetic activity, systemic inflammation, renin-angiotensin-aldosterone system dysfunction, increased vascular resistance, oxidative stress, damage to endothelial function, metabolic dysregulation, atherosclerosis and vascular injury^{17,19}. So tonic elevation of sympathetic neural activity due to sleep fragmentation and intermittent hypoxia and disturbance in sleep related baroreceptor activity could be considered as most important factors.

Awareness and understanding of the etiologic mechanisms underlying hypertension in OSA would assist us in the development of therapies against this comorbidity. Enough and proper sleep is important to reduce chances of hypertension. Almost 1400 years ago, Muhammad (Peace Be Upon Him) explained the value of proper sleep for good health. The Prophet (PBUH) said to one of his companions (IbnAmr) who was praying the whole night "Offer prayers and also sleep at night, as your body has a right on you" (SB 1874)²⁰. Which indicate importance of proper sleep from Islamic point of view.

CONCLUSION

There is a need to recognize importance of proper sleep at night and any sleep disturbance should be considered for immediate and proper therapy to prevent comorbidities like hypertension. Our study is emphasizing the need of improving our understanding regarding the pathophysiology of OSA and its relation with hypertension.

Author's Contribution:

Concept & Design of Study: Ambreen Qamar
 Drafting: Hafiz Syed Imran-Ul-Haq
 Data Analysis: Rashid Ahmed, Afsheen Qamar
 Revisiting Critically: Ambreen Qamar, Hafiz Syed Imran-Ul-Haq
 Final Approval of version: Ambreen Qamar

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

- Edwards BA, O'Driscoll DM, Ali A, Jordan AS, Trinder J, Malhotra A. Aging and sleep: physiology and pathophysiology. *Semin Respir Crit Care Med* 2010;31(5):618-33.
- Luyster FS, Strollo PJ, Jr., Zee PC, Walsh JK. Sleep: a health imperative. *Sleep* 2012;35(6):727-34.
- Adegunsoye A, Ramachandran S. Etiopathogenetic mechanisms of pulmonary hypertension in sleep-related breathing disorders. *Pulm Med* 2012;2012:273591.
- Karasulu L, Dalar L, Sokucu S, Altin S. Heart rate variability analysis of single-channel electrocardiogram can help to differentiate high-risk patients with obstructive sleep apnea syndrome - a study on diagnostic accuracy. *Anadolu Kardiyol Derg* 2012;12(4):331-8.
- Zhang J, Veasey S. Making sense of oxidative stress in obstructive sleep apnea: mediator or distracter? *Front Neurol* 2012;3:179.
- Song MK, Ha JH, Ryu SH, Yu J, Park DH. The effect of aging and severity of sleep apnea on heart rate variability indices in obstructive sleep apnea syndrome. *Psychiatry Investig* 2012;9(1):65-72.
- Tan H-L, Kheirandish-Gozal L, Gozal D. The promise of translational and personalised approaches for paediatric obstructive sleep apnoea: an 'Omics' perspective. *Thorax* 2014;69:450-6.
- Somers VK, Dyken ME, Mark AL, Abboud FM. Sympathetic-nerve activity during sleep in normal subjects. *N Engl J Med* 1993;328(5):303-7.
- Levy P, Tamisier R, Minville C, Launois S, Pepin JL. Sleep apnoea syndrome in 2011: current concepts and future directions. *Eur Respir Rev* 2011;20(121):134-46.
- Agrawal S, Sharma SK, Sreenivas V, Lakshmy R. Prevalence of metabolic syndrome in a north Indian hospital-based population with obstructive sleep apnoea. *Indian J Med Res* 2011;134(5):639-44.
- Drager LF, Bortolotto LA, Lorenzi MC, Figueiredo AC, Krieger EM, Lorenzi-Filho G. Early signs of atherosclerosis in obstructive sleep apnea. *Am J Respir Crit Care Med* 2005;172(5):613-8.
- Nieto FJ, Young TB, Lind BK, Shahar E, Samet JM. Association of sleep-disordered breathing, sleep apnea, and hypertension in a large community based study. *JAMA* 2000;283(14):1829-36.
- Angelico F, del Ben M, Augelletti T, de Vita R, Roma R, Violi F, et al. Obstructive sleep apnoea syndrome and the metabolic syndrome in an internal medicine setting. *Eur J Intern Med* 2010;21(3):191-5.
- Peppard PE, Young T, Palta M, J S. Prospective study of the association between sleep-disordered breathing and hypertension. *N Engl J Med* 2000;342(19):1378-84.
- Wilcox I, Grunstein RR, JA H. Effect of nasal continuous positive airway pressure during sleep on 24-hour blood pressure in obstructive sleep apnea. *Sleep* 1993;16(6):539 - 44.
- Suzuki M, Otsuka K, Guilleminault C. Long-term nasal continuous positive airway pressure administration can normalize hypertension in obstructive sleep apnea patients. *Sleep* 1993;16(6):545-9.
- He QY, Feng J, Zhang XL, Liang ZA, Huang SG, Kang J, et al. Elevated nocturnal and morning blood pressure in patients with obstructive sleep apnea syndrome. *Chin Med J (Engl)* 2012;125(10):1740-6.
- Witkowski A, Prejbisz A, Florczak E, Kadziela J, Sliwinski P, Bielen P, et al. Effects of renal sympathetic denervation on blood pressure, sleep apnea course, and glycemic control in patients with resistant hypertension and sleep apnea. *Hypertension* 2011;58(4):559-65.
- Feng J, BY C. Prevalence and incidence of hypertension in obstructive sleep apnea patients and the relationship between obstructive sleep apnea and its confounders. *Chin Med J* 2009;122:1464-68.
- Bahammam AS. Sleep from an Islamic perspective. *Ann Thorac Med* 2011;6(4):187-92.

Anemia in Patients Suffering from Chronic Kidney Disease

Shamsuddin Shaikh¹, Syed Qaiser Husain Naqvi² and Jawaid Hussain Lighari³

ABSTRACT

Objective: To determine the frequency of anemia in patients suffering from chronic kidney disease.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Department of Medicine, Peoples University of Medical and Health Sciences, Nawabshah, Sindh from January to, December 2016.

Materials and Methods: A total of 200 chronic kidney disease patients were selected by non-probability convenience sampling according to inclusion criteria chronic kidney disease for more than six months and age more than 20 years and exclusion criteria patients of blood disorders like Leukemia, lymphoma, hemorrhagic disorders, pregnancy and patients on NSAIDs. Detailed history and clinical examination was carried out. Patients were staged according to their glomerular filtration rate who has not received any treatment of anemia. Questionnaire was filled covering current treatment, weight, laboratory investigations including blood complete picture, blood urea, serum creatinine, estimated GFR, urine analysis. Data was entered and analyzed by SPSS software 21.0 version. The continuous variables were analyzed by student's T-test. Categorical variables were analyzed by chi-square test considering 95% CI and 5% margin of error.

Results: Study results show Mean Standard Deviation (SD) of age as 45.5 ± 7.5 years. Male patients comprised of 120 (60%) and female 80(40%). Mean and SD of creatinine clearance was noted as 40.6 ± 20.5 ml/1.73 m². Maximum Chronic Kidney Disease of stage IV was present in 84 (42%). Stage V, III, II and I were noted in 50 (25%), 30 (15%), 24 (12%) and 12 (6%) respectively. Anemia was noted in 170 (85%) study subjects. Mean \pm SD of Hemoglobin Distribution according to Staging of Chronic kidney disease revealed 9.16 ± 2.06 mg/dl. Most common microcytic hypo-chromic anemia 122 (61%) Patients while normocytic normochromic and macrocytic hypo-chromic anemia was found in 40 (20%) and 8 (4%) of chronic kidney disease subjects respectively.

Conclusion: The research study results conclude that majority of patients of CKD were anemic. Most common type of anemia in CKD patients is microcytic and hypochromic anemia. It is necessary to manage these patients timely and appropriately as their survival chances can be increased.

Key Words: Anemia, Chronic kidney disease, Blood Urea, Serum creatinine levels.

Citation of articles: Shaikh S, Naqvi SQH, Lighari JH. Anemia in Patients Suffering from Chronic Kidney Disease. Med Forum 2018;29(9):22-26.

INTRODUCTION

According to World Health Organization anemia is defined as a hemoglobin (Hb) concentration <13.0 g/dl for adult males and post-menopausal women and Hb of <12.0 g/dl for women.¹

From the major organs of the body, kidneys play important role, which filter nearly 200 liters of blood coming to them through blood vessels in 24 hours. This permits excess ions, metabolic wastes and toxins to go in urine and essential substances are retained for body use.

Its function is as purification plant which purifies blood, so that body organs, systems and cells may get blood free of waste products which may alter cell function or damage them. Kidneys normalize blood chemistry of electrolyte, urea, creatinine, calcium and PH. Kidneys are unappreciated until they are diseased.²⁻⁴

Chronic kidney disease (CKD) is a pathological deterioration of renal functioning culminates into hypertension, anemia, osteoporosis, neuropathy and vascular disease. Glomerular filtration rate is the best estimates of renal functions, which is indirectly measured by creatinine clearance and urine analysis. Patient is easily tired has puffiness around eyes, poor appetite, disturbed sleep, oedema on ankle and feet, dry skin, less urine output. Aging, uncontrolled D.M and hypertension, connective tissue disorders, family history of CKD are conditions which predispose to CKD.⁵ Anemia inpatients of CKD is multifactorial like anorexia, dietary restrictions, decreased erythropoietin, blood loss and even myelosclerosis kidney dialysis outcome quality initiative guideline defines CDK stages as below:

¹. Department of Medicine / Pathology² / Community Medicine³, Peoples University of Medical and Health Sciences, Nawabshah.

Correspondence: Dr. Shamsuddin Shaikh, Professor of Medicine and Pro-Vice Chancellor, Peoples University of Medical and Health Sciences, Nawabshah.

Contact No: 0300-3205588

Email: shams.shaikh57@yahoo.com

Received: January, 2018;

Accepted: April, 2018

Stage I: GFR ≥ 90 ml/min/1.73m². Kidney damage. Normal or increased GFR.

Stage II: GFR 60-89 ml/min/1.73m². Kidney damage with reduced GFR.

Stage III: GFR 30-59 ml/min/1.73m². Kidney damage with moderately reduced GFR.

Stage IV: GFR 15-29 ml/min/1.73m². Kidney damage with severely reduced GFR.

Stage V: GFR <15 ml/min/1.73m². on dialysis. Complete Kidney damage.⁶

Anemia in CKD patient has multifactorial effect as erythropoietin deficiency, inflammatory mediators like cytokines, iron and vitamin deficiency, bone marrow dysfunction and retention of nitrogenous compounds⁷.

In 1836 the Richard Bright first described anemia in CKD patients during search of Bright's disease, he noticed pallor^{7,8}.

National Kidney foundation and Kidney dialysis outcome quality initiative guideline in 2006, defined Anemia in CKD as:

Adult male- hemoglobin level < 13.5 g/l

Adult female- hemoglobin level < 12.0 g/l^{6,7}

It is reported that majority of CKD patients with reduced renal function usually present with normocytic and normochromic anemia. If left untreated, the anemia of CKD results into tissue hypoxia,⁹ cardiomegaly, congestive cardiac failure, angina, ventricular hypertrophy and increased or decreased cardiac output. About 26 million USA populations are suffering from CKD and millions more are at risk^{10,11}.

Anemic patient of CKD complaint of sluggish mental activity, reduced cognitive function, reduced penile tumescence at night and impaired immunity and immune response¹². Anemia causes growth retardation and decreased brain growth and intellectual functions in childhood. Such disabilities reduce quality of life (QoL), impair rehabilitation of the CKD patients and survival is decreased¹³.

Based on the WHO criteria of anemia, approximately, 90% patients of chronic kidney disease (CKD) with glomerular filtration rate (GFR) 25 -30 ml/min are suffering from anemia and usually present with Hb <10 g/dl¹⁴.

Reported prevalence of anemia defined as Hb <12 g/dl in CKD is 42%, 33%, 48% and 82% in stage 2 to stage 5 patients respectively. While anemia defined at Hb <11 g/dl, the prevalence was calculated as 21%,17%, 31%,49% and 72% respectively for stages 1 to 5¹⁵.

Regarding morphological classification of anemia, various reports have been observed in CKD patients. Reported results are 80%, 15% and 5% of normochromic-normocytic, hypochromic-microcytic and macrocytic anemia respectively. Study conducted by Levin had reported a prevalence of only 25% of anemia in CKD patients¹⁶.

A cross sectional study conducted in USA reported a prevalence of 47.7% of anemia among more than five

thousand CKD patients¹⁷. A study conducted in Indonesia at Department of Internal Medicine Sanglah Hospital Denpasar, Bali, by Ketul Suega reported a prevalence of 84.5% of an anemia in CKD patients¹⁸. In Nigeria a study by Akinsola found anemia in 87% of CKD patients¹⁹ and by Chinwuba noted a prevalence of anemia in 77.5% patients ranging from 26.7% to 77.5% in different CKD stages²⁰.

MATERIALS AND METHODS

This present cross sectional study was conducted after the approval of ethical review committee at Department of Medicine PUMHS Nawabshah (SBA). Data was collected at Medical Ward PMCH Nawabshah Sindh from January to, December 2016. 200 patients suffering from chronic kidney disease were assessed for anemia. Sample was selected by non-probability convince sampling considering inclusion criteria chronic kidney disease for more than six months and age more than 20 years and exclusion criteria patients of Leukemia, lymphoma and pregnancy. Detailed history was taken and clinical examination was carried out. Patients were staged according to their current Glomerular filtration, rate who has not received treatment of Anemia. Questionnaire was filled covering current treatment, weight, laboratory investigation including Blood Complete picture, blood urea, serum creatinine, estimated GFR and urine analysis. Data was collected on pre-tested structured questionnaire based on variables described above. It took about a one year to complete the collection of data. All data was entered in SPSS 21 version. The continuous variables were analyzed by student's T-test. Categorical variables were analyzed by chi-square test considering 95% CI and 5% margin of error. Data was analyzed for Standard deviations, frequencies and percentages.

RESULTS

Study results show Mean Standard Deviation (SD) of age noted as 45.5 ± 7.5 years. Males comprised of 120 (60%) and female 80(40%). Mean and SD of creatinine clearance was noted as 40.6 ± 20.5 ml/1.73 m². Most Chronic Kidney Disease patients of stage IV was present in 84 (42%). Stage V, III, II and I were noted in 50 (25%), 30 (15%), 24 (12%) and 12 (6%) respectively. Anemia was noted in 170 (85%) study subjects. Mean \pm SD of Hemoglobin Distribution according to Staging of Chronic kidney disease revealed 9.16 ± 2.06 mg/dl. Most common Microcytic hypo-chromic anemia was found in 122 (61%) Patients while normocytic normochromic and macrocytic hypo-chromic anemia 40 (20%) and 8 (4%) was noted in chronic kidney subjects respectively.

Table No. 1: Age Distribution of Study Population (n=200)

Age in years	Number of Pt. with Percentage	Mean and SD	P-Value
20- 29.9	22 (11%)	45.5 ±7.5	0.0001
30-39.9	28 (14%)		
40-49.9	70 (35%)		
50-59.9	120 (30%)		
≥60	20 (10%)		
Total	200 (100%)		

Table No. 2: Hemoglobin Distribution according to Staging of CKD (n=200)

Creatinine clearance showing staging (GFR) of CKD	Mean and SD (mg/dl)
Stage II: GFR 60-90 m/min/1.73m ² .	10.15±2.85
Stage III: GFR 30-59 m/min/1.73m ² .	9.55±2.63
Stage IV: GFR 15-29 m/min/1.73m ² .	8.12±2.32
Stage V: GFR <15 m/min/1.73m ² .	7.50±2.10
Total	9.16±2.06

Table No. 3: Body Mass Index (BMI) of study population (n=200)

BMI	Number of Pt. and Percentage	P-Value	Mean and SD
≤25 kg/m ²	116 (58%)	0.0001	26.9±3.17
25-29.9 kg/m ²	74 (37%)		
≥30 kg/m ²	10 (5%)		
Total	200 (100%)		

Table No. 4: Creatinine Clearance showing Staging (GFR) of CKD (n=200)

Creatinine clearance showing staging (GFR) of CKD	Mean and SD
Stage II: GFR 60-89 m/min/1.73m ² .	75.65 ± 6.10
Stage III: GFR 30-59 m/min/1.73m ² .	45.10 ± 7.5
Stage IV: GFR 15-29 m/min/1.73m ² .	20.25 ± 4.0
Stage V: GFR <15 m/min/1.73m ² .	11.50 ± 1.50
Total	40.00± 20.5

Table No. 5: Serum Creatinine according to Staging of CKD (n=200)

Creatinine clearance showing staging (GFR) of CKD	Mean and SD
Stage II: GFR 60-89 m/min/1.73m ² .	6.15 ± 3.49
Stage III: GFR 30-59 m/min/1.73m ² .	7.02 ± 3.96
Stage IV: GFR 15-29 m/min/1.73m ² .	5.39 ± 3.86
Stage V: GFR <15 m/min/1.73m ² .	5.39 ± 2.74
Total	6.98 ± 3.87

Table No. 6: Chronic Kidney Disease Distribution according to Staging (n=200)

Stage	No of Pt. and Percentage
Stage I: GFR ≥ 90 m/min/1.73m ² .	12 (6%)
Stage II: GFR 60-89 m/min/1.73m ² .	24 (12%)
Stage III: GFR 30-59 m/min/1.73m ² .	30 (15%)
Stage IV: GFR 15-29 m/min/1.73m ² .	84 (42%)
Stage V: GFR <15 m/min/1.73m ² .	50 (25%)
Total	200 (100%)

Table No. 7: Type of Anemia in study population (n=170)

Anemia	Yes (%)	No (%)	P-Value
No Anemia (Normal Hb)	-	28(14%)	0.0001
Normocytic Normochromic Anemia	43(21.5)	1(0.5%)	
Microcytic Hypochromic Anemia	122(61%)	0(0%)	
Macrocytic Hyperchromic Anemia	7(3.5)	1(0.5%)	
Total	170(85%)	30(15%)	200

DISCUSSION

Anemia is well-defined in terms of low levels of hemoglobin (Hb). It is a major consequence of chronic kidney disease (CKD), correlated with significant morbidity. Anemia of renal failure begins comparatively early in the development of kidney disease. As the destruction of the kidney progresses, the degree of anemia increase. The present study results revealed Anemia in 170 (85.0%) in CKD subjects Mean ±SD of Hemoglobin level according to staging of Chronic kidney disease revealed 9.16 ± 2.06 mg/dl. Talwar et al reported same result from India, a study conducted with a sample of 27 chronic renal failure subjects. Anemia was found in 84% of CKD patients, of which 60% had microcytic anemia²¹.

Anemia in CKD is obvious when a patient's creatinine clearance (CC) is less than 30 ml/min/1.73m², GFR is below 50-40 ml/min, or serum creatinine is more than 3 mg/dl. If the GFR is less than 20 ml/min or the serum creatinine is more than 5, anemia is constantly present and mostly the Hb level is below 10 g/dl²².

There are different causes of microcytic hypochromic anemia, but the major one is iron deficiency mostly due to a decrease iron intake or an increase in iron loss or aluminum intoxication in CKD patients. Folate and B12 deficiency leads to Macrocytic anemia. Both kinds of anemia can occur in CKD patients.²³

The findings of present study found microcytic hypochromic anemia most common 61.0% anemia in CKD patients while Normocytic Normochromic and

macrocytic hyper chromic anemia were less common in chronic kidney subjects respectively, these results are very comparable to study conducted by Reza Afshar et al²⁴, he measured anemia in 87% of post-dialysis patients and 75% of pre-dialysis patients and microcytic hypochromic anemia in (61.06%) of CKD subjects even similar with other studies¹⁸. Current study showed 3.5% of CKD patients had had macrocytic hypo- chromic anemia which is usually due to folate and or cyanocobalamin deficiency. The findings are comparable to studies conducted Iran, Saudi Arabia and Nepal.^{18, 24,-26}

CONCLUSION

The research study results conclude that majority of patients of CKD were anemic. Most common type of anemia in CKD patients is microcytic and hypochromic anemia. It is necessary to manage these patients timely and appropriately as their survival chances and longevity of life can be increased.

Author's Contribution:

Concept & Design of Study: Shamsuddin Shaikh
 Drafting: Syed Qaiser Husain Naqvi
 Data Analysis: Jawaid Hussain Lighari
 Revisiting Critically: Shamsuddin Shaikh, Syed Qaiser Husain Naqvi
 Final Approval of version: Shamsuddin Shaikh

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

- Örün E, Yalcin SS, Aykut O, Orhan G, Morgil GK, Yurdakok K, et al. Breast milk lead and cadmium levels from suburban areas of Ankara. *Sci Total Environ* 2011;409(13):2467-72.
- Guyton AC, Hall JE Textbook of Medical Physiology. 11th ed. Elsevier Saunders. Philadelphia: Pennsylvania; 2012.p.996-9.
- Barret KE, Barman SM, Boitano S, Brooks H. Ganong's Review of Medical Physiology, 24th ed. M'c Graw Hill Medical Publishing: New York; 2012.p.428-37.
- Kumar JJ. Role of Computed Tomography in the Evaluation of Renal Masses. Dissertation. Rajiv Gandhi University of Health Sciences Bangalore Karnataka, India; 2012.
- National kidney Foundation. URL;www.goole.com/nkf/ accessed. 30 December 2016.
- George M. Estimated GFR in diagnosis and staging of chronic kidney disease in patients with type 2 diabetes mellitus. Dissertation. Rajiv Gandhi University of Health Sciences, karnaaka, Bangalore 2011.
- Juma A. Prevalence of anemia and its associated factors in patients with chronic kidney disease at Muhimbili. Dissertation. Muhimbili University of Health and Allied Sciences. October, 2012.
- Remuzzi G. Hematologic consequences of renal failure. Brenner BM, editors. The kidney. 5th ed. Philadelphia: WB Saunders Co;2016.p.2170-85.
- Iqaki N, Takashima M, Ohyama M, Oh S, Kida A, Yanase K, et al. the beneficial effect of effective control of anemia on hyperinsulinemia and hypoxemia in a hemodialysis patient with corrected transposition of the great arteries. *Clin Exp Nephrol* 2004;8(2):163-7.
- Gosmanova EO, Le NA. Cardiovascular Complications in CKD Patients: Role of Oxidative Stress. *Cardiol Res Pract* 2011; 2011: 156326.
- Taddei S, Nami R, Bruno RM, Quatrini I, Nuti R. Hypertension, left ventricular hypertrophy and chronic kidney disease. *Heart Fail Rev* 2011;16(6): 615-20.
- Kralova S, Leva L, Toman M Changes in lymphocyte function and subsets in dogs with naturally occurring chronic renal failure. *Can J Vet Res* 2010;74(2):124-9.
- Iseki K. Role of chronic kidney disease in cardiovascular disease: are we different from others? *Clin Exp Nephrol* 2011;15(4): 450-5.
- Kazmi WH, Kausz AT, Khan S, Abichandani R, Ruthazer R, Obrador GT et al. Anemia: an early complication of chronic renal insufficiency. *Am J kidney Dis* 2001;38(4):803-12.
- Shaheen F, Souqiyyeh MZ, Al-Attar BA, Karkar A, Al Jazairi AM, Badawi LS, et al. Prevalence of anemia in predialysis chronic disease patients. *Saudi J Kidney Dis Transpl* 2011;22:456-63.
- Afshar R, Sanavi S, Salimi J, Ahmadzadeh M. Hematological profile of chronic kidney disease (CKD) patients in Iran, in pre-dialysis stages and after initiation of hemodialysis. *Saudi J Kidney Dis Transpl* 2010;21:368-71.
- Chiyuan HSU, McCulloch CE, Curhan GC. Iron Status and Hemoglobin level in Chonic renal Insufficiency. *J Am Soc Nephrol* 2016;13:2783-2786.
- Suega K, Bakta M, Dharmayudha TG, Profile of Anemia in Chronic Renal Failure Patients: Comparison between Predialyzed and Dialyzed Patients at the Division of Nephrology, Department of internal Medicine, Sanglah Hospital, Denpasar, Bali, Indomesia. *Indonesia J Int Med* 2015;37.
- Akinsola A, Durosinmi MO, Akinla NO, The hematological profile of Nigerians with chronic renal failure. *Afri J Med Med Sci* 2015;29:13-6.
- Chinwuba I, Uchenna I, Ngozi I. High prevalence of anemia in predialysis patients in Enugu, Nigeria. *Nephrol Reviews* 2010;2:14.

21. Talwar VK, Gupta HL. Shashinaryan. Clinico-hematological profile in chronic renal failure. J Assoc Physicians Ind 2016; 50: 228-33.
22. Besarab A, Mc Crea JB. Anemia in ESRD. In: Nissenson MR, Fine RN, editors. Dialysis therapy 2nd ed. Philadelphia: Hanely Inc;2012.p.223-5.
23. Monograpgh. Signs and symptoms of uremia. In: Block RM Alfred HJ, Fan PY Stoff JS, editors. Rose and Block's clinical problems in nephrology. 1st ed. Little, Brown and Company: Boston; 2011.p.497-523.
24. Bhatta S, Aryal G, Kafle RK, Anemia in chronic kidney disease patient in predialysis and post dialysisstage. J Pathol Nepal 2016;1: 26-9.
25. Afshar R, Sanavi S, Salimi J. Hematological profile of chronic kidney disease patients in Iran, in pre-dialysis stages and after initiation of hemodialysis. Saudi J Kid Dis Transpl 2010; 21: 368-71.
26. Akinsola A, Durosinmi MD, Akinola NO. The hematological profile of Nigerians with chronic renal failure. Afr J Med Sci 2016;29:13-16.

Dental Caries Determinants in High School Students of Public Sector in District Sialkot

Rehana Kausar¹, Nadia Munir¹, Naveed Inayat² and Khalid Ismail³

ABSTRACT

Objective: To find out the determinants of dental caries in the high school children at public sector in district Sialkot.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Department of Dental Materials, Islam Dental College Sialkot, from June 2017 to December 2017.

Materials and Methods: In this study 382 high school children of 9 public sector girls (4) and boys (5) high schools in district Sialkot were included. Simple random sampling technique was applied. Study tool was a questionnaire. The data was analyzed using SPSS version 24.0.

Results: Almost 62.83% of children had dental problems in the past and about 52.9% missed school due to dental pain. Almost 87.4% of the children ate sweets several times a week. About 37.2% had never visited a dentist. A strong association ($p \leq 0.05\%$) was found between dental caries and high intake of sweets, chocolates, juices, fizzy drinks etc. and poor oral hygiene practice.

Conclusion: Students consuming moderate carbohydrates and sugars, were less susceptible to dental caries. The maintained oral hygiene was one of the possible reasons. We can say that moderate sugar intake with regular brushing, at least twice daily with fluoridated toothpaste is essential to minimize the chances of dental cavities.

Key Words: Prevalence, Dental Caries, Tooth Decay, District Sialkot

Citation of articles: Kausar R, Munir N, Inayat N, Ismail K. Dental Caries Determinants in High School students of Public Sector in District Sialkot. Med Forum 2018;29(9):27-31.

INTRODUCTION

Dental caries is a contagious illness that destroys the mineralized portion of the tooth. It is described as “an irreparable bacterial disease of the tooth, in which dead substance of the tooth is deprived of minerals and living portion of the tooth is impaired that results in the formation of empty space within tooth called cavitation”. For this to occur, an association of four factors is required: a vulnerable tooth surface, presence of certain bacteria in dental plaque, duration of exposure and a carbohydrates rich diet, mainly sugars. Caries is derived from a Latin word which means, ‘rotten’¹.

Dental caries is one of the most common childhood diseases, affecting a large population of the world. Dental caries is identified as one of the important problems among school children. It has shown that age range of 11–14 years is highest risk group². In the United States and Europe, about sixty to eighty percent patients of tooth decay have been reported in children³.

In the United Kingdom, in a national survey in 2003, 34% of 12 year olds and 49% of 15 year olds had detectable carious lesion⁴. Dental caries is a process that involves an imbalance of demineralization and remineralization activities in the dental surface due to intermittent acid attack⁵. Sugar intake in form of candy, honey, pastries and soft drink produces acid that destroy mineralized tooth structure⁶. It is known that poor oral hygiene is related to increased risk for caries development whereas accurate tooth brushing lowers the prevalence of dental caries⁷. Besides the main etiological factors, bacteria like streptococcus mutans and lactobacilli and salivary secretion and buffering capacity are also risk factors for dental caries⁸. It is now accepted that it is not amount but frequency of carbohydrate ingestion is important in the etiology of dental caries⁹.

Oral health is a public health issue that affects children and impairs their quality of life. This disease causes pain, discomfort and has a high morbidity potential. Furthermore, it puts a financial burden on public health services. WHO has revealed that almost 60-90% of the school going children have dental caries experience globally¹⁰. About 2.43 billion young people and almost 620 million children of the world are having dental caries in their teeth. Majority of cases of dental caries have been reported in Latin America, South Asia and Middle East¹¹. Every year, children loss almost fifty-one million school hours because of dental caries which is the second-most common adverse health state¹². Dental caries complications are cavernous sinus

¹. Department of Dental Materials / Prosthodontics², Islam Dental College Sialkot.

³. Department of Allied Health Sciences, University of Lahore.

Correspondence: Rehana Kausar, Senior Lecturer Islam Dental College, Sialkot.

Contact No: 0334-8603939

Email: reeha.aaa@live.com

Received: April, 2018;

Accepted: June, 2018

thrombosis or Ludwig angina which is characterized by infection of the soft tissues around the tooth and can be even life-threatening¹³. In Pakistan, prevalence of dental caries is 50-70% and it is due to the inadequate access to oral health care¹⁴.

Despite oral health promotion in the developed and developing countries, oral diseases are still considered a health issue worldwide. Caries prevention is one of the most important strategies in many countries. It is recommended, that for maintaining good oral health, tooth brushing with fluoridated toothpaste twice daily is best practice¹⁵. The levels of antioxidants change in response to an infection or inflammation or disease¹⁶. Salivary peroxidase controls oral bacteria which lead to dental caries. It has been shown that total protein and total antioxidant level of saliva were increased with caries activity¹⁷. No epidemiological studies done so far to evaluate the dental caries in high school children of district Sialkot so this study is conducted in public sector school children to find out the determinants of dental caries. Educating the people regarding the awareness of these determinants may result in reduction of this disease.

MATERIALS AND METHODS

This study was conducted at the Department of Dental Materials, Islam Dental College Sialkot. from June 2017 to December 2017. Sampling frame was made which included listing of all the public schools in district Sialkot. List was obtained from DDO /EDO Education. Schools were selected by convenient sampling method. Selected schools name are Government Boys M.C E/S High School, Government Girls High School HabibPura, Sialkot, Government. High School, AdalatGarah, Sialkot, Government Lady Anderson Girls High School, Sialkot, Government Higher Secondary School ,Sialkot City, Sialkot, Government Pilot Higher Secondary School, Sialkot, Government Girls High School Dharowal, Sialkot, Government Boys High School, Gunna, Sialkot, Government Boys High School, Badiana, Sialkot.

Informed consent was obtained from participants to fill up the questionnaire. In this study, 382 children at public sector high schools in district Sialkot were included. Simple random sampling technique utilized. One boys and one girls school was visited weekly from 9a.m.to 1 p.m. with aim of taking response of 76 students in a week. It took 5 weeks to get sample of 382 students. Inclusion criteria included students in public sector schools in district Sialkot, age range 12 – 16 years and belonging to district Sialkot. Exclusion criteria were residents other than the district Sialkot, private school students and non-cooperative students. Ethical approvals were obtained from the concerned authority and verbal permission was obtained from participants. The response of participants was recorded on questionnaire. The questionnaire was in English and

contained questions on variables of dental caries. Students of grade 6 and 7 needed guidance while grade 8 to 10 students filled the questionnaire conveniently. The data was entered and analyzed using SPSS version 24.0. Data is shown in tables and figures.

RESULTS

Table 1: Depicts that out of 382 participants, **67.74%** students of all schools were from class 8th whereas **65.11%** students were from class 6th the second highest. This includes all schools and both gender.

Table No.1: Screening results (n=382)

Have you suffered from any dental problem in the past					
		Yes	No	Total	Percentage who suffered Caries
Classes	6 th	56	30	86	65.11%
	7 th	63	44	107	58.88%
	8 th	63	30	93	67.74%
	9 th	41	28	69	59.42%
	10 th	17	10	27	62.96%
Total		240	142	382	62.83%

Table No.2: Association between Mother Education and Dental Caries.

Have you suffered from any dental problem in the past?		Yes	No		%age suffered
Mother Education	<Primary	1	1	2	50%
	Primary-SSC	79	45	124	63.71%
	HSSC-Graduate	146	88	234	62.39%
	Masters	14	8	22	47.40%
Total		240	142	382	62.83%

Chi square = 3.39, df = 3, P value = 0.01

Table No.3: Association between Monthly Income and Dental Caries.

Monthly Income versus dental Caries					%age of affected children
Have you suffered from any dental problem in the past?					
		Yes	No		
Monthly Income	15000-25000	39	15	54	72.22%
	25000-35000	144	97	241	59.75%
	35000-45000	43	24	67	64.18%
	>45000	14	6	20	70%
Total		240	142	382	62.83%

Chi square = 0.207, df = 3, P value = 0.006

Table 2: Association between Mother Education and Dental Problem (Caries). Well educated mothers' children will have regular dental checkup with good brushing habits. Mothers' education of **63.71%** students was high school. Lowest affected students were the

children of mothers who were qualified up to master's level, i.e. 47%.

Table 3: Association between Monthly Income and Dental Problem (Caries). About 72.22% students from all schools were from lowest socioeconomic status. Students from high socioeconomic level were eating unhealthy or Junk food which shows that lack of oral hygiene and selection of unhealthy foods contribute to dental caries.

Table 4: Association between Regular Tooth brushing and Dental Caries

Table 5: Association between Eating Chocolates and Dental Caries.

Table No.4: Association between Regular Tooth brushing and Dental Caries.

		Dental Caries found			%age of affected students.
		Yes	No		
Do you brush your teeth?	Yes	236	135	371	63.61%
	No	4	7	11	36.36%
Total		240	142	382	62.83%

Chi square = .065, df = 1, P value = 0.066

Table No.5: Association between Eating Chocolates and Dental Caries.

		Dental Caries Found.		Total	Percentage of affected students
		Yes	No		
Do you eat chocolates?	Yes	222	132	354	62.71%
	No	18	10	28	64.29%
Total		240	142	382	62.83%

Chi square = .028, df = 1, P value = .027

DISCUSSION

The study shows the assessment of risk factors for caries such as high frequency of cariogenic food intake, inadequate oral hygiene care, insufficient fluoride exposure, poor oral hygiene, inappropriate methods of tooth brushing and poverty. The approach to primary prevention should be based on common risk factors. The results of the study were similar to a cross-sectional study conducted by Umer MF, et al in four schools of Sargodha district¹⁸. The incidence of dental caries was found higher in children who did not brush their teeth or brushed occasionally. The study also showed that children never visited the dentist for treatment. The current study confirmed the association of dental caries and role of sugars. Sugars and other carbohydrates provide substrate for the actions of oral bacteria, which in turn lower plaque and salivary pH. The resultant action is tooth demineralization. Many factors in addition to sugars affect the caries process, including the form of food, the duration of exposure, nutrient composition, sequence of eating and oral hygiene. The current study has confirmed the direct relation between intake of dietary sugars and dental

caries during growing age. Since the introduction of fluoride, the incidence of caries worldwide has decreased, despite increases in sugars consumption. S Abdullah, et al studied determinants of dental caries to find out any possible association of caries with oral hygiene and food habits. In this study 543 patients with dental caries between 6-9 years were selected from dental OPD of Children's Hospital, PIMS, Islamabad. They concluded that substandard oral health and sucrose rich diet increases the likelihood of dental caries¹⁹.

Similarly across sectional study was carried out to calculate the caries frequency and risk factor in 12-15 years school children in Malir Town, Karachi. The prevalence of dental caries observed was 66.67%²⁰. The dental caries increased as the age increased from 12 to 15 year. The current study shows that excessive use of sugars as cakes, biscuits and chocolates triggers high teeth problems. Even the use of fruit juices and milk or tea with sugars is damaging for the teeth. Moreover, the analysis of the association speaks volumes regarding the findings of the research.

Similar results were shown by a cross-sectional study that was conducted in North West Ethiopia among 280 patients attending Debre Tabor General Hospital dental clinic. Prevalence of dental caries was found high. Socioeconomic status, literacy level, and poor oral hygiene were associated factors for dental caries²¹. Another similar study was conducted by Lonim Prasai Dixit and his team at Chepang School, Nepal. The study reported 31% school children aged 8-16-year old suffered oral pain. The brushing habit was reportedly low with only 24% of the children brushing twice daily²².

CONCLUSION

According to this study, the determinants of dental caries in high school children of district Sialkot were, lack of awareness about oral hygiene measures in parents, limited knowledge of tooth brushing techniques, fluoride toothpaste and flossing because of low socioeconomic status.

Frequently, high intake of carbohydrates and sugar containing food makes children prone to dental caries. Age range of 12 -16 year is important because of deep pits and fissures of permanent teeth, growth hormones in children causes more craving for sweets, change in eating habits in school and home and self-selection of food. Lack of frequent dental visits or visit only when there is severe pain due to poor socioeconomic status and lack of awareness were the other factors. Unavailability of fluoridated water in many areas of community makes dental tissues more prone to carious attack. Lastly, unavailability of preventive care strategies and fluoridation methods in many areas of district Sialkot increased the risk of carious attack in school children in public sector.

Recommendations

- Oral hygiene awareness for brushing teeth with fluoride-containing toothpaste in children.
- The health department and NGOs must play their role to boost the knowledge of population through electronic and print media about dental caries, its significant factors and safety measures.
- Awareness and counseling of parents regarding role of nutrition and dietary modifications to reduce caries risk in children.
- Non cariogenic foods for snacks should be used for munching
- Cariogenic food should be limited to mealtime and should be avoided between meals.
- Cariogenic foods should be immediately cleared from the child's mouth by tooth brushing or by consumption of protective foods.
- Sugar snacks that are slowly eaten should be restricted e.g. candy, cough drops, lollipops and suckers.
- Limiting the access to regular soda and powdered beverages among children.
- Increasing plain water, milk, and milk products consumption.
- Using xylitol-containing products to help in preventing dental caries especially while targeting high-risk populations.
- Further studies may be recommended to establish the prevalence of dental caries in Sialkot district as a whole including non-school going children.

Acknowledgment: The authors would like to acknowledge the assistance provided by kind cooperation of dr Madiha Muqaddas (house officer) for her wonderful job in data collection. She helped in dealing with the children and enabled data collection successful. To my friends and family who constantly reminded me what was at stake and to keep working towards the goal until the very end. And finally to the teachers and the pupils who were very co-operative during data collection, they took time out of their teaching and learning schedules and for this, I highly appreciate.

Author's Contribution:

Concept & Design of Study: Rehana Kausar
 Drafting: Nadia Munir
 Data Analysis: Naveed Inayat, Khalid Ismail
 Revisiting Critically: Rehana Kausar, Nadia Munir
 Final Approval of version: Rehana Kausar

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Usha C, Sathyanarayanan R. Dental caries-a complete changeover (Part I). *J Conservative Dent* 2009;12(2):46.
2. Rehman MM, Mahmood N, Rehman B. The relationship of caries with oral hygiene status and extra-oral risk factors. *J Ayub Med Coll Abbottabad* 2008;20(1):103-8.
3. Touger-Decker R, Van Loveren C. Sugars and dental caries. *Am J Clin Nutr* 2003;78(4):881S-92S.
4. Nbi KDSB. Dental caries experience and associated risk factors among 12-year-old primary school children in njiru district, nairobi county: School of Dental Sciences, College of Health Sciences, University of Nairobi; 2014.
5. Neel EAA, Aljabo A, Strange A, Ibrahim S, Coathup M, Young AM, et al. Demineralization–remineralization dynamics in teeth and bone. *Int J Nanomed* 2016;11:4743.
6. Keyes PH. Present and future measures for dental caries control. *J Am Dent Assoc* 1969;79(6):1395-404.
7. Haleem A, Khan A. Dental caries and oral hygiene status of 12 years old school children in Pakistan. *Pak J Med Res* 2001;40(4):138-42.
8. Gábris K, Nyárasdy I, Bánóczy J. Significance of assessing risk factors for caries in their prevention. *Orvosi hetilap* 2002;143(24):1467-73.
9. Gustafsson BE, Quensel CE, Lanke LS, Lundqvist C, Grahnen H, Bonow BE, et al. The effect of different levels of carbohydrate intake on caries activity in 436 individuals observed for five years. *Acta Odontologica Scandinavica* 1953;11(3-4):232-364.
10. Petersen PE, Bourgeois D, Ogawa H, Estupinan-Day S, Ndiaye C. The global burden of oral diseases and risks to oral health. *Bulletin of the World Health Organization* 2005;83:661-9.
11. Petersen PE. The World Oral Health Report 2003: continuous improvement of oral health in the 21st century—the approach of the WHO Global Oral Health Programme. *Community Dentistry and oral epidemiology*. 2003;31:3-24.
12. Jackson SL, Vann Jr WF, Kotch JB, Pahel BT, Lee JY. Impact of poor oral health on children's school attendance and performance. *Am J Pub Health* 2011;101(10):1900-6.
13. Shweta S. Dental abscess: A microbiological review. *Dental Res J* 2013;10(5):585.
14. Sahito N, Sahito MA, Fazlani KA. Prevalence of Dental Caries among School Children in Hyderabad Pakistan. *Int J Appl Sci Res and Review* 2015;2(1):034-8.

15. Chesters R, Huntington E, Burchell C, Stephen K. Effect of oral care habits on caries in adolescents. *Caries Res* 1992;26(4):299-304.
16. Hegde A, Rai K, Padmanabhan V. Total antioxidant capacity of saliva and its relation with early childhood caries and rampant caries. *J Clin Pediatr Dent* 2009;33(3):231-4.
17. Tulunoglu Ö, Demirtas S, Tulunoglu I. Total antioxidant levels of saliva in children related to caries, age, and gender. *Int J Paediatr Dent* 2006;16(3):186-91.
18. Umer MF, Farooq U, Shabbir A, Zofeen S, Mujtaba H, Tahir M. Prevalence and associated factors of dental caries, gingivitis, and calculus deposits in school children of sargodha district, pakistan. *J Ayub Med Coll Abbottabad* 2016;28(1):152-6.
19. Maxood A. Dental caries status in 6-9 years old children. *Pak Oral Dent J* 2008;28:107-12.
20. Ali Leghari M, Tanwir F, ALI H. Dental caries prevalence and risk factors among school children age 12-15 years in Malir, Karachi. *Pakistan Oral & Dental J* 2012;32(3).
21. Tafere Y, Chanie S, Dessie T, Gedamu H. Assessment of prevalence of dental caries and the associated factors among patients attending dental clinic in Debre Tabor general hospital: a hospital-based cross-sectional study. *BMC Oral Health* 2018;18(1):119.
22. Dixit LP, Shakya A, Shrestha M, Shrestha A. Dental caries prevalence, oral health knowledge and practice among indigenous Chepang school children of Nepal. *BMC Oral Health* 2013; 13(1):20.

Effect of Glycemic Control on Homocystine Levels in Type 2 Diabetes Mellitus - A Six Month Follow-up Study

Zulfania¹, Soheb Rehman² and Tahir Gaffar³

ABSTRACT

Objective: Review of the available reports is unable to determine with any certainty the association of glycemic control (HbA1c) and homocystine (Hcy) in diabetes. Therefore, the present study was carried out to ascertain the relation of glycemic control with Hcy levels.

Study Design: Cohort study

Place and Duration of Study: This study was conducted at the Endocrinology Unit of Hayatabad Medical Complex (HMC). A laboratory analysis was done in the laboratory of Rehman Medical Institute (RMI), Peshawar from April 2015 to October 2015.

Materials and Methods: This cohort study was conducted on 125 patients who were known type 2 diabetics visiting Endocrinology unit of HMC. A detailed medical history and clinical examination was carried out to exclude co morbidities. At all three visits i.e baseline, first and second follow up HbA1c and Hcy were recorded. Statistical analysis of the data was done by SPSS version 20 using Pearson correlation test to correlate HbA1c levels with Hcy levels.

Results: The mean age of 125 study subjects was 51 ± 8.37 years, out of these 68% were females and 32% were males. The mean HbA1c levels reduced from baseline ($9.64 \pm 2.25\%$) to ($8.56 \pm 1.99\%$) till second follow up. Mean Hcy levels did not dropped from baseline (10.04 ± 4.31) to second follow up (11.46 ± 3.95), rather increased. There was no correlation of Hcy with HbA1c in baseline data ($r = -0.052$, $p = 0.576$), first follow up ($r = -0.023$, $p = 0.836$) and second follow up (0.098 , $p = 0.521$). No correlation was also evident in change of Hcy and HbA1c levels noticed from baseline till second follow up.

Conclusion: The study concluded that there is no correlation of Hcy and HbA1c in baseline as well as follow up data.

Key Words: HbA1c, glycemic control, , Hcy, Type 2 diabetes mellitus

Citation of articles: Zulfania, Rehman S, Gaffar T. Effect of Glycemic Control on Homocystine Levels in Type 2 Diabetes Mellitus - A Six Month Follow-up Study. Med Forum 2018;29(9):32-35.

INTRODUCTION

Diabetes mellitus is a metabolic disorder characterized by increased blood glucose levels which may result from defective insulin secretion, its action or both. Due to long term hyperglycemia, this disease causes damage and dysfunction of organs like heart, kidneys, eyes, blood vessels and nerves¹.

WHO survey conducted in 1995 showed that Pakistan was at number 8th position in top ten countries with high diabetic prevalence, with about 4.3 million people suffering from diabetes mellitus. This survey also anticipated that in year 2025, Pakistan will be on the 4th position with 14.5 million people having diabetes².

¹. Department of Physiology / Biochemistry², Rehman Medical College, Peshawar.

³. Department of Endocrinology, Lady Reading Hospital, Peshawar.

Correspondence: Dr. Zulfania, Assistant Professor of Physiology, Rehman Medical College, Peshawar.

Contact No: 0332-9297758

Email: Zulfania.khan@rmi.edu.pk

Received: February, 2018;

Accepted: June, 2018

A Pakistani survey conducted in 2012 showed the prevalence of diabetes as 7.7% in rural and 10.6% in urban areas³. An international study reported that about 7 million people were suffering from diabetes in Pakistan in year 2016⁴.

Homocysteine (Hcy), formed during methionine demethylation in all cells of body, is a sulfur-containing, small, non-protein-forming amino acid. Extra amount of intracellular Hcy is exported to the circulation. In circulation approximately 1% remains in free form and the remainder binds to albumin or forms disulfide dimers, principally with cysteine⁵. An elevated Hcy level is considered as a risk factor for atherosclerosis, cerebrovascular disease, and peripheral vascular disease. The causes of hyper-homocysteinemia include genetic enzymes deficiencies, deficiency of vitamins (folic acid, B₁₂, B₆), certain medications, and impaired renal function⁶.

A study suggested that Hcy influences endothelial function by enhancing a prothrombotic environment causing platelet activation and endothelial leukocyte interactions⁷. In addition, Hcy enhances inflammatory responses that are recognized for their role in atherosclerotic disease⁸. Early prediction of

cardiovascular events by elevated plasma Hcy is reported by different authors. Studies done in Nigerian-Africans showed a moderate rise in plasma Hcy in cases of established cardiovascular disease⁹.

Studies of Hcy in type 2 diabetics have shown variable and uncertain results; some of them have revealed a positive association of Hcy levels with glycemic control¹⁰ but Hoogeveen et al in their study found no correlation between the two¹¹. Therefore, the present study was carried out to ascertain the relation of glycemic control with Hcy.

MATERIALS AND METHODS

This cohort study was conducted in Endocrinology Unit of Hayatabad Medical complex (HMC). Laboratory analyses of the collected samples were done in the laboratories of Rehman Medical Institute (RMI), Peshawar from April 2015 to October 2015. Type 2 diabetics with age 45-65 years admitted in Endocrinology Unit of HMC were included in this study. All subjects who had type 1 diabetes mellitus, any acute infection or chronic inflammatory disease like infection of upper or lower respiratory tract, urogenital tract, GIT were also not included. Moreover patients with anemia or taking NSAIDS, lipid lowering drugs or are pregnant or breast feeding were excluded.

Data Collection: A detailed medical history and physical examination was conducted on the subjects. All data were recorded on pre-designed Performa (Annex A). A fasting blood sample was taken by venipuncture and was kept in ice packs until transferred to Rehman medical institute laboratory where it was centrifuged and stored at -80°C. Levels of Hcy was measured by micro particle enzyme immunoassay and HbA1c by immunoassay by using (Abbott) laboratory kits according to the protocol.

Data Analysis: Data about age, gender, BMI, fasting blood glucose, HbA1c and Hcy was entered into SPSS on daily basis. Data was analyzed to measure the frequency proportions, percentages, ratios, means and standard deviations. Pearson's correlation coefficient was used to determine the correlation between Hcy and HbA1c.

RESULTS

In this study, 125 type 2 diabetics were examined and followed up for 6 months. The initial blood samples were analyzed to measure HbA1c and Hcy. Then samples were taken again taken after three and six month's duration of the initial samples. Due to loss of data in follow up only about 70% of the calculated sample size (110 patients) could be used for final analysis.

In Table No. 1, HbA1c0 indicates baseline glycosylated hemoglobin level, HbA1c1 indicates first follow up and HbA1c2 indicates glycosylated hemoglobin levels of second follow up in percentage (%). Table 3.2 shows

mean baseline glycemic control (HbA1c0) was 9.64 ± 2.25 %. The mean glycaemic control at 1st follow up (HbA1c1) decreased to 8.83 ± 2.01 %. The mean glycaemic control in 2nd follow up (HbA1c2) further reduced to 8.56 ± 1.99 %. The change of HbA1c level in baseline and first follow up, and that between baseline and second follow up was significant. While the HbA1c change during first and second follow up was not significant.

Table No.2 shows mean baseline homocysteine levels (Hcy0) was 10.04 ± 4.31 $\mu\text{mol/l}$. The mean Hcy level in first follow up (Hcy1) was 10.84 ± 4.18 $\mu\text{mol/l}$. The mean Hcy level in second follow up (Hcy2) was 11.46 ± 3.95 $\mu\text{mol/l}$. The change of Hcy level in baseline and first follow up was insignificant, however change of Hcy levels between first and second follow up and baseline and second follow up was significant.

Figure 1 shows no correlation of HbA1c0 and Hcy0 (with $r = -0.052$ P-Value = 0.576). Figure 2 shows no correlation of HbA1c1 and Hcy1 (with $r = -0.023$ P-Value = 0.836). Figure 3 shows no correlation of HbA1c2 and Hcy2 in 2nd follow up (with $r = 0.098$ and $p = 0.521$).

Table No.1: Baseline, 1st follow up and 2nd follow up HbA1c levels

Sr.#	Variables	Mean (%)	Standard Deviation	95%CI	p value
1	HbA1c0	9.64	2.25	-1.491 to -0.132	0.020
	HbA1c1	8.83	2.01		
2	HbA1c1	8.83	2.01	-0.362 to 0.910	0.396
	HbA1c2	8.56	1.99		
3	HbA1c2	8.56	1.99	0.409 to 1.762	0.002
	HbA1c0	9.64	2.25		

Table No.2: Baseline, 1st and 2nd follow up Hcy

Sr. #	Variables	Mean (mg/l)	Standard Deviation	95%CI	p value
1	Hcy0	10.04	4.31	-1.153 to 1.551	0.772
	Hcy1	10.84	4.18		
2	Hcy1	10.84	4.18	-2.909 to -0.322	0.015
	Hcy2	11.46	3.95		
3	Hcy2	11.46	3.95	-2.733 to -0.100	0.035
	Hcy0	10.04	4.31		

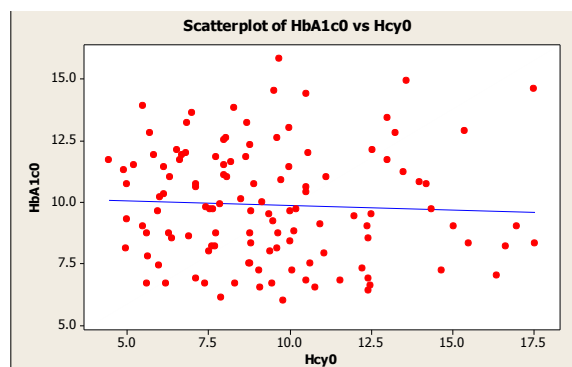


Figure No.1: Correlation of HbA1c0 and Hcy0 in baselinedata ($r = -0.052$, P-Value = 0.576).

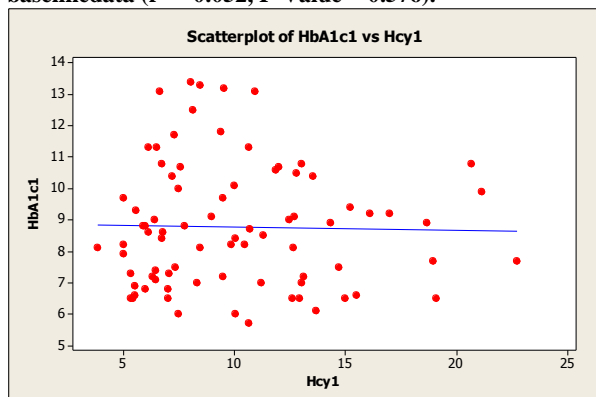


Figure No.2: Correlation of HbA1c1 and Hcy1 in first follow updata ($r = -0.023$, P-Value = 0.836).

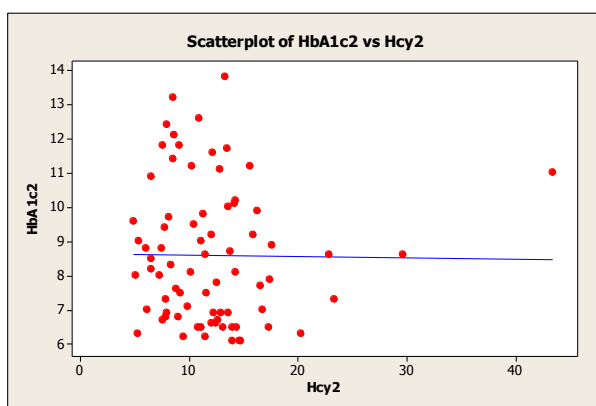


Figure No.3: Correlation of HbA1c2 and Hcy2 in 2nd follow up($r = 0.098$, P-Value = 0.521)

DISCUSSION

In the present study the mean HbA1c levels dropped from 9.64% to 8.56% significantly till the 2nd follow up. Similar drop in HbA1c level was reported in studies in which type 2 diabetics were followed up for four months or more months^{13,14}.

In the current study the mean Hcy level observed in baseline sample increased in first and second follows up. Similar rise in Hcy levels was observed in a study in which lipid profile and cardiovascular risk markers were checked in type 2 diabetics¹⁵. The possible reason for this mild rise in Hcy levels might be that dose of anti-diabetic medications were adjusted to control HbA1c levels in subsequent follow ups as most of the patients were receiving metformin as monotherapy or in combination with insulin and other hypoglycemic drugs, it could have led to decreased vitamin B12 level in their bodies resulting in slight rise of Hcy levels. Passaro et.al. reported a fall in Hcy levels in type 2 diabetics when followed for 3 years¹⁶ but most of the subjects were on anti-diabetic medications other than metformin in their study. The Hcy level of $9.66 \pm 3.23 \mu\text{mol/l}$ in type 2 diabetics without cardiovascular complications was reported by Tarkun et.al. is in agreement with the result of present¹⁷. As

Hcy levels remain in normal range in patients without cardiovascular and renal complications that's why the present study with participants without diabetic complications reported normal Hcy levels.

The present study revealed no correlation of Hcy and HbA1c in baseline data, first follow up and second follow up. Similarly there was no correlation of the change of Hcy and HbA1c levels in all three phases. These findings endorse the report of other studies including a study conducted in Iran in which healthy controls were compared with type 2 diabetics having either good or poor glycemic control. They observed that although Hcy levels were higher in diabetics but not significantly different among various groups. They concluded that glycemic control does not influence Hcy levels and no correlation exists between the two variables¹⁸. Other researchers like Hoogeveen et al. also found no association of glycemic control and Hcy¹⁹. A study in which Aghamohammadi et al. studied the correlation of Hcy and HbA1c in 70 type 2 diabetic males reported no statistically significant association between the two variables²⁰. This study also had the same conclusion that just keeping glycemic control is not sufficient for maintaining lower Hcy levels but other measures such as use of vitamin B12 and folic acid is also necessary for diabetics. The effect of improved glycemic control and insulin sensitivity on Hcy levels was investigated by Pouwels et al. and they also confirmed that HbA1c levels have no influence on Hcy²¹. A study conducted on Kenyan type 2 diabetics without any cardiovascular disease also showed no effect of HbA1c levels on Hcy²².

On the other hand significant correlation of Hcy with HbA1c was noticed by Passaro et al. who did 3 years follow up of type 2 diabetics. These researchers noticed that a significant positive correlation exists between glycemic control and Hcy¹⁶. These findings might be because of longer follow up duration of the study necessary to achieve the glycemic control required to influence Hcy levels and its correlation. A very weak positive and statistically insignificant correlation of HbA1c and Hcy was reported in a study of type 2 diabetics who didn't have any cardiovascular disease¹⁷. A study done to assess the nutritional status and Hcy levels of elderly type 2 diabetics, reported a very weak association of HbA1c and Hcy²³. Therefore, it can be inferred that the correlation of Hcy with HbA1c is not certain from researcher's point of view and further studies of larger sample size and longer duration must be conducted to ascertain the association between the two variables.

The limitations of this study was a small sample size ($n=125$) and loss of 39% of the baseline data in the follow up which accounted for 30% of sample size ($n=110$). Only 70% data was available for final analysis which is a common impediment of conducting prospective studies in uneducated and poor population coming to public sector hospitals for consultation.

CONCLUSION

The association of Hcy and HbA1c could not be ascertained by the present study, but it may be mentioned that longer period of glycemic control may be required to influence the Hcy level to extent that a significant correlation is established.

Author's Contribution:

Concept & Design of Study: Zulfania
 Drafting: Zulfania, Soheb Rehman
 Data Analysis: Tahir Gaffar
 Revisiting Critically: Soheb Rehman
 Final Approval of version: Zulfania

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. American Diabetes Association. Diagnosis and classification of diabetes Mellitus. Diabetes Care 2013;36(Suppl 1):S67-74.
2. World Health Report. World health Organization (WHO).1211;Geneva 27, Switzerland, 2003.
3. Ramachandran A, Snehalatha C, Shetty A, Nanditha A. Trends in prevalence of diabetes in Asian countries. World J Diabetes 2012;3(6):110.
4. Sandu M-M, Protasiewicz DC, Firanesco AG. Data regarding the prevalence and incidence of diabetes mellitus and prediabetes. Romanian J Diabetes Nutr Metabol Dis 2016;23(1):95-103.
5. FruchartJC, Nierman MC, Stroes ES, Kastelein JJ, Duriez P. New risk factors for atherosclerosis and patient risk assessment. Circulation 2004;109(suppl):III-15– III-19.
6. Cheng Z, Yang X, Wang H. Hyperhomocysteinemia and Endothelial Dysfunction. Curr Hypertens Rev 2009;5(2):158–65.
7. Pasterkamp G, Algra A, Grobbee DE, Banga JD, van der Graaf Y. Homocysteine and the stage of atherosclerotic disease: A study in patients suffering from clinically silent and clinically manifest atherosclerotic disease. Eur J Clin Invest 2002;32:309–15.
8. Poddar R, Sivasubramanian N, Dibello PM, Robinson K, Jacobson D. Homocysteine induces expression and secretion of monocyte chemo attractant protein-1 and interleukin-8 in human aortic endothelial cells: Implication for vascular disease. Circulation 2001;103:2717–23.
9. Ebesunun MO, Agbedana EO, Taylor GOL, Oladapo OO. Plasma lipoprotein (a), homocysteine and other cardiovascular disease(CVD) risk factors in Nigerians with established CVD. Appl Physiol Nutr Metab 2008;33:282–9.
10. Shaikh MK, Devrajani BR, Shaikh A, Shah SZA, Shaikh S, Singh D. Plasma Homocysteine Level in Patients with Diabetes mellitus. World Applied Sciences J 2012;16(9):1269-73.
11. Hoogeveen EK, Kostense PJ, Beks PJ, et al. Hyperhomocysteinemia Increases Risk of death Especially in type 2 Diabetes. Circulation 2000; 101: 1506-10.
12. Huang T, Asimi S, Lou D, Li D. Plasma phospholipid polyunsaturated fatty acids and homocysteine in Chinese type 2 diabetes patients. Asia Pac J Clin Nutr 2012;21(3):394-9.
13. Khatana SAM, Taveira TH, Choudhary G, Eaton CB. Change in Hemoglobin A1c and C-Reactive Protein Levels in Patients With Diabetes Mellitus. J Cardiometabolic Syndrome 2009;4(2):76-80.
14. Siaw MYL, Chew DEK, Dalan R, Abdul Shakoor SAKK, Othman N, Choo CH, et al. Evaluating the Effect of Ramadan Fasting on Muslim Patients with Diabetes in relation to Use of Medication and Lifestyle Patterns: A Prospective Study. Int J Endocrinol 2014.
15. Group TS. Lipid and Inflammatory Cardiovascular Risk Worsens Over 3 Years in Youth With Type 2 Diabetes The today clinical trial. Diabetes Care 2013;36(6):1758-64.
16. Passaro A, Calzoni F, Volpato S, Nora ED, Pareschi PL, Zamboni PF, et al. Effect of metabolic control on homocysteine levels in type 2 diabetic patients: a 3 year follow up. J Int Med 2003;254(3):264-71.
17. Tarkun I, Arslan BC, Canturk Z, Tarkun P, Kozdag G, Topsever P. Homocysteine concentrations in type 2 diabetes mellitus patients without cardiovascular disease: relationship to metabolic parameters and diabetic complications. Turkish J Endocrinol Metabolism 2003;1:11-7.
18. Heydari-Zarnagh H, Nejat Shookohi A, Nourozi A. Effect of Glycemic Control on Homocysteine Levels in Type 2 Diabetic Patients without Cardiovascular Disease. Zahedan J Res Med Sci 2014;16(1):23-7.
19. Hoogeveen EK, Kostense PJ, Jakobs C, Dekker JM, Nijpels G, Heine RJ, et al. Hyperhomocysteinemia increases risk of death, especially in type 2 diabetes 5-year follow-up of the Hoorn Study. Circulation 2000;101(13):1506-11.
20. Aghamohammadi V, Pourghassem Gargari B, Aliasgharzadeh A. Evaluation of the level of plasma homocysteine in patients with type 2 diabetes mellitus under metformin treatment and its correlation with serum total antioxidant capacity, malondialdehyde, creatinine, insulin resistance and glycemic control. ZUMS J 2011;19(76):1-10.
21. Pouwels M-JJ, den Heijer M, Blom HJ, Tack CJ, Hermus AR. Improved insulin sensitivity and metabolic control in type 2 diabetes does not influence plasma homocysteine. Diabetes Care 2003;26(5):1637-9.
22. Otieno CF, Vaghela V, Ogola EN, Amayo EO. Patterns of homocysteine in Kenyans with type 2 diabetes without overt cardiovascular disease at Kenyatta National Hospital, Nairobi. East African Med J 2006;82(12).
23. Chen SF, Cui CL, Wu P, Xie NZ. Relationship of serum homocysteine level with nutritional status and HbA1c level in elderly inpatients. Int J Clin Exp Med 2013;6(9):779-84.

Mortality Associated with Isolated Pathogens in Neonatal Sepsis at Izzat Ali Shah Hospital, Wah Cantt

Shahzad Haider¹, Sajid Nazir¹, Khushboo Sehar¹ and Munazza Saleem²

ABSTRACT

Objective: To analyse the mortality associated with isolated pathogens in neonatal sepsis in neonatal intensive care unit (NICU) at Izzat Ali Shah Hospital (IASH)

Study Design: A retrospective cohort study.

Place and Duration of Study: The study was conducted in NICU of IASH, Wah Cantt from 1st September 2016 to 31st December 2017.

Material and Methods: We analysed medical records of all the neonates admitted at Neonatal unit, IASH during study period. Records of patients with isolated pathogens on blood culture were included in study cohort. Outcome variable was mortality associated with isolated pathogens. Data including the gender, gestational age, place and mode of delivery, weight at birth and blood culture results were recorded against the outcome in the form of discharged home, died and transferred to other hospitals. Data was analysed by using SPSS version 19.

Results: Case records of 49 neonates were enrolled in the study, Overall mortality rate was 26%. Klebsiella (n=14) was the highest number of isolated pathogen followed by Acinetobacter and E-Coli. Mortality was highest with Methicillin resistant staphylococcus aureus (60%) followed by E-Coli (44.4%), Acinetobacter (23%) and Klebsiella (21%). Analysis of study cohort showed that 27 were males (55%) and 22 were females (45%) with mortality rate of 22% (15) and 31.8% (18) respectively. In study cohort 11 babies (22.4%) had gestational age <32 weeks with mortality rate of 45.5% (5) while in full term babies mortality reduced to 17.9%. Mortality in home delivered babies was 38.5%. Baby with vaginal delivery were 24 (42%) with 25% mortality. Among 25 neonates who were born by Caesarean section mortality rate was 28%. Two (66%) out of 3 neonates of less than 1000 gm died while 5 (25%) out of 22 babies of more than 2500 gm died during the admission.

Conclusion: The study concluded that mortality rate was higher in extreme preterm and very low birth weight babies with neonatal sepsis. Klebsiella has become the most common pathogen causing neonatal sepsis followed by Acinetobacter and E Coli. Highest mortality rate was observed with MRSA.

Key Words: Pathogens, Blood culture, Neonatal Sepsis

Citation of articles: Haider S, Nazir S, Sehar K, Saleem M. Mortality associated with Isolated Pathogens in Neonatal Sepsis at Izzat Ali Shah Hospital, Wah Cantt. Med Forum 2018;29(9):36-39.

INTRODUCTION

Sepsis is the major cause of neonatal morbidity and mortality. It contributes to nearly 40% of deaths under 5 year of age¹. Neonatal sepsis if left untreated causes long term neuro disability. In underdeveloped countries, almost 1 million deaths every year are attributed to neonatal sepsis, meningitis and encephalitis².

Neonatal sepsis is defined as a clinical syndrome in an infant of life 28 days or younger, manifested by systemic signs of infection and isolation of bacterial pathogen from the blood stream.³

Diagnosis of neonatal sepsis is always a challenge for the neonatologists. Neonatal sepsis is suspected in a neonate with variety of presentations. NICE guideline has illustrated all the probable risk factors and clinical indicators for early onset neonatal sepsis⁴. The guideline describes the necessary investigations to be performed and treatment required in cases of neonatal sepsis.

The spectrum of implicated pathogens varies from region to region and also changes over time at the same place^{5,6}. The pattern of organisms varies from nursery to nursery. It also depends, how strict is the infection control in maternity and nursery⁷. The causative organisms are usually Gram positive and Gram negative bacteria and Candida.

The aim of the study is to identify the causative organisms of neonatal sepsis in NICU, IASH and also see its impact on neonatal mortality. It is very important to know the organisms causing neonatal sepsis in any NICU and their sensitivity patterns for treatment of neonatal sepsis. In Pakistan, previous studies showed Gram negative organisms up to 47% followed by gram positive organism (38%) and candida (23%) in both

¹. Department of Paediatrics, Izzat Ali Shah Hospital, Wah Medical College, Wah Cantt.

². Department of Paediatrics, Wah Medical College, Wah Cantt.

Correspondence: Dr Shahzad Haider, Consultant Paediatrician, Izzat Ali Shah Hospital, Lalarukh, Wah Cantt.
Contact No: 0333-5247886
Email: shahzadhaider5@gmail.com

early and late onset sepsis^{8,9}. However there is no study available which quantify the pathogens in terms of mortality.

MATERIALS AND METHODS

This retrospective cohort study was conducted at neonatal unit in Izzat Ali Shah Hospital (IASH). This is level 2 neonatal unit with some facilities of level 3. Unit received admissions from its own maternity unit and from outside as well. Primary outcome was to see the relation of mortality with identified organisms and secondary outcome was to analyse the relation of other variables with mortality.

All neonate who were admitted in the unit from 1st September 2016 to 31st December 2017 and suspected to have neonatal sepsis at any stage proven with their blood culture results were included in the study. Suspicion of neonatal sepsis was based on clinical history, examination and laboratory data. Data of all the neonates were collected from case records. Total of 127 blood culture reports were identified and 49 showed isolated pathogens, so blood cultures with no growth were excluded from the study. Data included gender, gestational age, place and mode of delivery, weight at birth and blood culture result. Outcome in the form of discharged home, died and transferred to another hospital was recorded in the pre designed proforma. Neonates with incomplete data and other complex co morbid conditions were excluded from the study.

Neonate is defined as baby up to 28 days of life. Gestational age was divided under 3 categories of <32 weeks, 33 to 36 weeks and >37 weeks. Place of delivery was in IASH, other hospital or at home. Mode of delivery was vaginal, caesarean or others. Weight in grams was divided in four categories (<1000, 1000 to 1500, 1500 to 2000 and >2500). All blood cultures were sent under aseptic condition in BD BACTEC culture media to the renowned laboratory. The blood cultures results were recorded on the proforma. All data was analysed on SPSS version 19.

Chi-square test of association determined no significant association/relationship between the outcome and all the other variables.

RESULTS

Case records of 49 out of 127 neonates were enrolled in the study, so blood culture yield was 39%,

Highest number of isolated pathogen was Klebsiella (n=14) followed by Acinetobacter and E-Coli. Highest mortality rate was observed with MRSA (60%) followed by E-Coli (44%), Acinetobacter (23%) and Klebsiella (21%).

Pseudomonas, Xanthomonas maltophilia, Coagulase negative Staphylococcus aureus (CONS) and Candida were among the less common organism isolated.

Analysis of study cohort showed that 27 were males (55%) and 22 were females (45%). Nineteen (70.4%) of

male babies went home while 6 (22%) died. In females, 15 (68%) went home while 7 (31.8%) died (Table). Overall mortality rate was 26%.

Out of 11 neonates who were <32 weeks gestational age, 6 (54%) were sent home and 5 (45%) died. Six (60%) out of 10 babies of gestation age 33 to 36 weeks were discharged and 3 (30%) died. Twenty two (78.6%) neonates of gestational age >37 weeks discharged home while 5 (17.9%) babies died.

Twenty eight neonates were born in IASH with death rate of 25%. Mortality rate was higher for the babies born at home (37.5%).

Twenty four neonates were born by vaginal delivery and 18 (75%) of them got better while 6 (25%) died during the admission. Among 25 neonates who were born by Caesarean section 16 (64%) were discharged home and 7 (28%) died.

Only 2 babies were transferred to other hospital and both showed growth of Klebsiella.

Table No.1: Demographic factors and pathogens affecting neonatal mortality

	n	Home	Died	Transferred to other hospital
Gender: Male	27	19(70.4%)	6(22.2%)	2(7.4%)
female	22	15(68.2%)	7(31.8%)	0(0.0%)
Gestational age:				
<32 weeks	11	6(54.5%)	5(45.5%)	0(0.0%)
33-36 weeks	10	6(60.0%)	3(30.0%)	1(10.0%)
>37 weeks	28	22(78.6%)	5(17.9%)	1(3.6%)
Place of delivery: IASH	28	19(67.9%)	7(25.0%)	2(7.1%)
Other Hospital	13	10(76.9%)	3(23.1%)	0(0.0%)
Home	08	5(62.5%)	3(37.5%)	0(0.0%)
Mode of delivery: Vaginal	24	18(75.0%)	6(25.0%)	0(0.0%)
Caesarean section	25	16(64.0%)	7(28.0%)	2(8.0%)
Weight at birth: <1000	3	2(66.7%)	1(33.3%)	0(0.0%)
1001-1500	3	1(33.3%)	2(66.7%)	0(0.0%)
1501-2500	23	17(73.9%)	5(21.7%)	1(4.3%)
>2500	20	14(70.0%)	5(25.0%)	1(5.0%)
Blood culture:				
Acinetobacter	13	10(76.9%)	3(23.1%)	0(0.0%)
E Coli	09	5(55.6%)	4(44.4%)	0(0.0%)
Klebsiella	14	9(64.3%)	3(21.4%)	2(14.3%)
MRSA	05	2(40.0%)	3(60.0%)	0(0.0%)
Pseudomonas Auroginosa	03	3(100.0%)	0(0.0%)	0(0.0%)
Xanthomonas Maltophilia	01	1(100.0%)	0(0.0%)	0(0.0%)
Staphylococcus aureus	03	3(100.0%)	0(0.0%)	0(0.0%)
Candida	01	1(100.0%)	0(0.0%)	0(0.0%)

DISCUSSION

Neonatal sepsis is the most common problem in neonatal units. Blood culture is the gold standard in diagnosing the neonatal sepsis though it often shows growth of CONS which could be contaminated organism. Mortality is high in neonatal sepsis in under developed countries due to multiple factors. Perinatal infection and lack of strict hygienic measures during perinatal care and in NICU are the major factors

causing neonatal sepsis. In spite of availability of good antenatal care in some hospitals, overall perinatal infection rate is high in Pakistan. Neonatal sepsis is among the most common reason causing neonatal death. This study showed mortality of 26% which is better than other studies in similar settings in Egypt (45%)¹⁰, Tanzania (39%)¹¹ and Cameroon (34.7%)¹². This study found the highest mortality rate associated with babies who were born at home. As there is high risk of acquiring perinatal infections during delivery, by the time these babies arrive in neonatal unit, they are terminally unwell.

Our study does not show significant relation of mortality with mode of delivery. Similar findings are observed in others studies^{13,14}, even in very low birth weight infants¹⁵. Study in Brazil found negative association of neonatal mortality with Caesarean section¹⁶.

Mortality associated with very low birth weight (VLBW) was as high as 60% in cases with suspected neonatal sepsis. Similar findings were observed in study in Cameroon with mortality rate being higher with weight on <2500 gm and gestation less than 37 weeks¹⁷. Horbar et al found the mortality associated with VLBW babies up to 39% which gradually improved over period of time¹⁸.

Blood culture showed growth in 49 (38%) neonates which is comparable to other studies in Bangladesh (34.88%)¹⁹, Uganda (37%)²⁰ and Nigeria (45.9%)²¹. In neonatal sepsis, pathogen may not be isolated due to multiple factors. Neonate may already have received doses of antibiotics, the amount of blood required in culture bottle may be insufficient or there may be viruses (cytomegalovirus, rubella etc) or parasite (Toxoplasma) involved in causing sepsis. In our study gram negative organism especially Klebsiella, Acinetobacter and E Coli being the commonest organism which is in contrast to other local and international studies where staphylococcus epidermidis (40%) was mostly isolated^{9, 22,23}. Neonates usually acquire gram negative organisms during perinatal period. These can also be transferred as nosocomial infection if strict hygiene is not maintained in making intravenous fluids in the neonatal unit.

Mortality was most associated with MRSA followed by E Coli. Though MRSA was identified in only 5 patients, so its significance is questionable. Nosocomial infections are getting more prevalent and neonatal units have to follow strict infection control policy to prevent cross infection^{24,25}.

This study did not look at the resistance pattern of different isolates which has major impact on the neonatal mortality. With the increase in use of antibiotics, neonatal units are facing lot of multidrug resistance pattern in isolated pathogens. It is becoming difficult to treat them with usual antibiotics. Further

studies are required to see the resistance pattern of these organisms.

CONCLUSION

Neonatal sepsis in one of the commonest cause of mortality in under developed countries. Mortality is higher in extreme preterm and very low birth weight neonates. In our study its mortality rate is slightly higher in babies born vaginally. Blood culture yield is 39% in cases of suspected neonatal sepsis. Klebsiella, Acinetobacter and E Coli are the most common organisms isolated. Mortality was highest with MRSA followed by E Coli.

Author's Contribution:

Concept & Design of Study:	Shahzad Haider, Sajid Nazir
Drafting:	Shahzad Haider
Data Analysis:	Shahzad Haider
Revisiting Critically:	Munazza Saleem
Final Approval of version:	Shahzad Haider, Sajid Nazir

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. UNICEF, WHO, The World Bank and the United Nations, Levels and Trends in Child Mortality, UNICEF: New York, USA, 2011.
2. Black RE, Cousens S, Johnson HL et al. Global, regional and national causes of child mortality in 2008: a systemic analysis. Lancet 2010; 375(9730): 1969-87
3. Edwards MS and Baker C J "Sepsis in the newborn", in Krugman's Infectious Diseases of Children. In: Gershon AA, Hotez PJ, Katz SL, editors, Mosby. Philadelphia: PA USA; 2004.
4. National Institute for Health and Care Excellence. Neonatal infection (early onset): antibiotics for prevention and treatment 2012. (NICE Guideline CG149). Available at: <https://www.nice.org.uk/guidance/CG149>.
5. Shrestha S, Adhikari N, Rai BK, Shreepaili A. Antibiotic resistance pattern of bacterial isolates in neonatal care unit. JNMA J Nepal Med Assoc 2010;50(180):277-81.
6. Ghotaslou R1, Ghorashi Z, Nahaei MR. Klebsiella pneumoniae in neonatal sepsis: a 3-year-study in the pediatric hospital of Tabriz, Iran. Jpn J Infect Dis 2007;60(2-3):126-8.
7. Klein JO and Remington JS. Current concepts of infection of the fetus and newborn infant, in Infectious Diseases of the Fetus and Newborn. WB Saunders: Philadelphia: Pa USA; 2000.p.1-24.
8. Zaidi AK, Thaver D, Ali SA, et al. Pathogens associated with sepsis in newborns and young

- infants in developing countries. *Pediatr Infect Dis J* 2009;2(1 Suppl): S10–S18.
9. Haque KN, Waheed KAI, Waqar T. Rational Use of Antibiotics for Neonates in Pakistan. *Pak Pediatr J* 2013; 37(1): 5-15
 10. Moore KL, Kainer MA, Badrawi N, et al. Neonatal sepsis in Egypt associated with bacterial contamination of glucose-containing intravenous fluids. *Pediatr Infect Dis J* 2005;24(7):590–594.
 11. Kayange N, Kamugisha E, Mwizamholya DL, et al. Predictors of positive blood culture and deaths among neonates with suspected neonatal sepsis in a tertiary hospital, Mwanza-Tanzania. *BMC Pediatr* 2010;10(39).
 12. Chiabi A, Djoupomb M, Mah E, et al. The clinical and bacteriological spectrum of neonatal sepsis in a tertiary hospital in Yaounde, Cameroon. *Iranian J Pediatr* 2011;21(4):441–448.
 13. Zhu JJ, Bao YY, Zhang GL et al. No relationship between mode of delivery and neonatal mortality and neurodevelopment in very low birth weight infants aged two years. *World J Pediatr* 2014; 10(3):227-31.
 14. Walsh CA, Robson M and McAuliffe FM. Mode of delivery at term and adverse neonatal outcomes. *Obstet Gynecol* 2013;121(1):122-8.
 15. Malek-Mellouli M, Ben Amara F, Gallouz N et al. Does the mode of delivery affect neonatal morbidity and mortality in very low-birth-weight infants? *Tunis Med* 2013;91(3):183-7.
 16. Machado Júnior LC, Sevrin CE et al. Association between mode of delivery and neonatal deaths and complications in term pregnancy: a cohort study in Brazil. *Minerva Pediatr* 2014;66(2):111-22.
 17. Mah Mungyeh E, Chiabi A, Tchokoteu Pouasse FL, et al. Neonatal mortality in a referral hospital in Cameroon over a seven year period: trends, associated factors and causes. *Afr Health Sci* 2014; 14(3):517-25.
 18. Horbar JD, Carpenter JH, Badger GJ. Mortality and neonatal morbidity among infants 501 to 1500 grams from 2000 to 2009. *Pediatr* 2012;129(6):1019-26.
 19. Ahmed S, Chowdhury MA, Hoque M, et al. Clinical and bacteriological profile of neonatal septicaemia in a tertiary level pediatric hospital in Bangladesh. *Ind Pediatr* 2002;39(11):1034–1039.
 20. Mugalu J, Nakakeeto MK, Kiguli S, et al. Aetiology, risk factors and immediate outcome of bacteriologically confirmed neonatal septicaemia in Mulago hospital, Uganda. *African Health Sci* 2006;6(2):120– 126.
 21. Meremikwu MM, Nwachukwu CE, Asuquo AE, et al. Bacterial isolates from blood cultures of children with suspected septicaemia in Calabar, Nigeria. *BMC Infect Dis* 2005;5(110).
 22. Li Z, Xiao Z, Zhong Q, et al. 116 cases of neonatal early-onset or late-onset sepsis: a single centre retrospective analysis on pathogenic bacteria species distribution and antimicrobial susceptibility. *Int J Clin Exper Med* 2013;6(8): 693–699.
 23. Mohammadi P, Kalantar E, Bahmani N, et al. Neonatal bacteremia isolates and their antibiotic resistance pattern in neonatal intensive care unit (NICU) at Beasat Hospital, Sanandaj, Iran. *Acta Med Iran* 2014;52(5):337-40.
 24. Dramowski A, Madide A and Bekker A. Neonatal nosocomial bloodstream infections at a referral hospital in a middle-income country: burden, pathogens, antimicrobial resistance and mortality. *Paediatr Int Child Health* 2015; 35(3):265-72.
 25. Verstraete E, Boelens J, De Coen K, et al. Healthcare-associated bloodstream infections in a neonatal intensive care unit over a 20-year period (1992-2011): trends in incidence, pathogens, and mortality. *Infect Control Hosp Epidemiol* 2014;35(5):511-8.

Depression in Patients with Rheumatoid Arthritis

Depression with Rheumatoid Arthritis

Syed Shayan Ali¹, Munir Hussain², Babar Bashir³ and Jawwad us Salam³

ABSTRACT

Objective: To determine the frequency of depression in patients of rheumatoid arthritis presenting at tertiary care hospital, Karachi.

Study Design: Hospital based / cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Medicine of Dow University and Jinnah Postgraduate Medical Center Karachi from 1st January 2017 to 30th June 2017.

Materials and Methods: The required sample size came out to be 260 rheumatoid patients. Prevalence 42%, margin of error 6% and confidence level 'C.I'=95%. This sample size was calculated using the open epi software.

Inclusion Criteria: Diagnosed patient of Rheumatoid Arthritis of more than 2 years duration on treatment who met the diagnostic criteria, of either gender, between 30 to 60 years of age.

Exclusion Criteria: Patients with symptoms of mania, bipolar affective disorder or post-traumatic stress disorder or other systemic illness.

Results: Out of 260 patients minimum age of the patient was 30 while maximum age of the patient was 60 years. Among 260 patients, 115 (44.2%) were found to have depression. Age distribution shows that out of 260 patients, 53 (20.4%) were in the age range of 30-40 years of ages, 120 (46.25) were between 41-50 years of ages and 87 (33.5%) were in between 51-60 years of ages.

Conclusion: A close liaison between rheumatologist and mental health professionals could prove beneficial for these patients.

Key Words: Depression, Patients, Rheumatoid Arthritis

Citation of articles: Ali SS, Hussain M, Bashir B, Salam J. Depression in Patients with Rheumatoid Arthritis. Med Forum 2018;29(9):40-43.

INTRODUCTION

Rheumatoid arthritis is a multisystem disabling autoimmune disease that affects between 0.5% and 1.0% of the adult population worldwide.^{1,2} It is the most common form of polyarticular inflammatory arthritis characterized by persistent synovial inflammation, bony erosions and progressive articular destruction leading to varying degrees of physical disability. In South Pakistan, the prevalence of rheumatoid arthritis is said to be 0.9/1000 and 1.98/1000 in poor and affluent districts respectively, whereas in North Pakistan, the prevalence of major rheumatic disorders is quoted as 148/1000.³⁻⁴

Depression is currently the fourth leading cause of Global Burden of Diseases (GBD) and by the year 2020, it is projected to become the second leading cause of disability. People suffering from long-term medical conditions are twice as likely to suffer from major depression within the next year as compared to subjects without chronic disorders.

Depression occurs in 13-20% of patients suffering from Rheumatoid Arthritis (RA) and is two to three times more common in patients with RA than in the general population. Depression increases the burden of RA for the patient and society, leading to more physical symptoms and is less likely to be reassured by a doctor, which may lead to poor compliance with medications.

Psychiatric syndromes have significant implications for patients with rheumatoid arthritis: individuals with both arthritis and depression report increased functional disability and increased levels of arthritis-related pain, compared to individuals with arthritis alone. Psychological and social factors are important causes of disability in patients suffering from musculoskeletal pain problems. In a community-based study conducted in Europe, Ohayon et al. showed that there was a high burden of depression, as a comorbid of pain and recommend that all patients with chronic painful physical conditions, should be evaluated systematically for depression.

MATERIALS AND METHODS

Consenting cases of Rheumatoid Arthritis diagnosed as defined in operational definition, meeting inclusion and exclusion criteria were enrolled in the study from the outpatient department of Dow University of Health Sciences and Jinnah Postgraduate Medical Centre Karachi. Permission from the institutional ethical review committee was taken prior to conduction of

¹. Department of Medicine / Neurology², DUHS, Karachi.

³. Department of Medicine, Shaheed Mohtarma Benazir Bhutto Medical College, Karachi.

Correspondence: Dr. Syed Shayan Ali, Assistant Professor of Medicine, DUHS, Karachi.

Contact No: 0343-2306459

Email: syedshayanali83@gmail.com

Received: March, 2018;

Accepted: May, 2018

study. Informed consent was obtained from all the patients for assigning them to sample and using their data in research. Demographic information of age of onset of Rheumatoid Arthritis, duration, frequency and course of disease was taken from the patient and confirmed by attendant. Beck Depression Inventory Questionnaire was used to diagnose depression. The researcher himself interviewed the patient in a conducive environment assuring him/her of confidentiality. Subject scoring more than 9 was termed as having depression. The findings of variables as mentioned above were entered in the Proforma.

Date Analysis Procedure: Data was analyzed on SPSS Version 16. Demographic data has been presented as simple descriptive statistics giving mean and standard deviation for age and duration of disease. Qualitative variables like gender, marital status, educational status and socioeconomic status & depression have been presented as frequency and percentages. Effect modifiers were controlled through stratification of age, gender, marital status, educational status and socioeconomic status to the effect of these on depression. Chi square test was applied, $P \leq 0.05$ was taken as significant.

RESULTS

A total of 260 diagnosed patients of rheumatoid arthritis who met the inclusion and exclusion criteria were included in this study. Out of 260 patients minimum age of the patient was 30 while maximum age of the patient was 60 years.

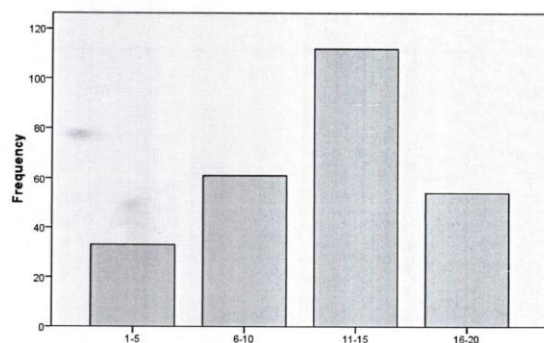


Figure No.1: Duration of disease distribution

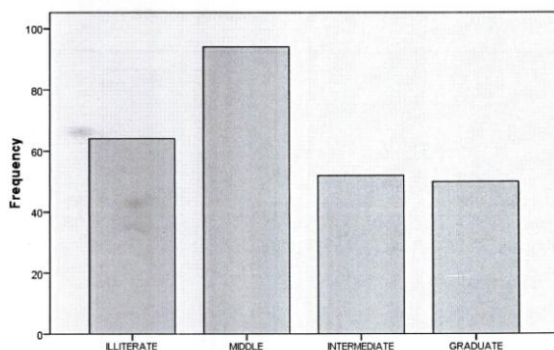


Figure No.1: Educational status distribution

Among 260 patients, 115 (44.2%) were found to have depression. Age distribution shows that out of 260 patients, 53 (20.4%) were in the age range of 30-40 years of ages, 120 (46.25) were between 41-50 years of ages and 87 (33.5%) were in between 51-60 years of ages. Most of the patients have disease for more than 10 years as shown in figure 1.

Table No.1: Descriptive statistics of age and duration of disease

Variable	Means ±SD	Standard Deviation	Min- Max
Age (years)	45.41	±6.89	30-60
Duration of disease (years)	12.96	±4.63	3-20

Table No.2: Depression distribution

Age (years)	Depression		Total
	Yes	No	
30-40	49 (92.5%)	04 (7.5%)	50 (100%)
41-50	29 (24.2%)	91 (75.8%)	120 (100%)
51-60	37 (42.5%)	50 (57.5%)	87 (100%)
Total	115 (44.2%)	145 (55.8%)	260 (100%)
P-value	0.00		

Table No.3: Depression according to gender

Gender	Depression		Total
	Yes	No	
Male	16 (40%)	24 (60%)	40 (100%)
Female	99 (45%)	121 (55%)	220 (100%)
Total	115 (44.2%)	145 (55.8%)	260 (100%)
P-value	0.55		

Table No.4: Depression according to educational status

Educational Status	Depression		Total
	Yes	No	
Illiterate	26 (40.6%)	38 (59.4%)	64 (100%)
Middle	38 (40.4%)	56 (59.6%)	94 (100%)
Intermediate	27 (51.9%)	25 (48.1%)	52 (100%)
Graduate	24 (48%)	26 (52%)	50 (100%)
Total	115 (44.2%)	145 (55.8%)	260 (100%)
P-Value	0.48		

Educational status distribution shows that out of 260 patients, 64 (24.6%) were illiterate, as shown in Figure 2. Depression is common in the age group 30-40 years as shown Table-2, and is more common in females as shown Table-3.

Stratification for educational status and socio-economic groups with respect to depression is shown in table-4 and 5 respectively.

Table No.5: Depression according to socio economical status

Economical Status	Depression		Total
	Yes	No	
Lower Class (less than Rs.10,000)	72 (51.8%)	67 (48.2%)	139 (100%)
Middle Class (Rs.10,000 Rs.20,000)	22 (28.2%)	56 (71.8%)	78 (100%)
Upper Class (More than Rs.20,000)	21 (48.8%)	22 (51.2%)	43 (100%)
Total	115 (44.2%)	145 (55.8%)	260 (100%)
P-Value	0.00		

DISCUSSION

Rheumatoid Arthritis is a chronic autoimmune disease and affects approximately 1% of the population^{1,2}. The connection between depression and the illness experience of patients with RA has attracted considerable attention from researchers and clinicians. RA is not an uncommon disease in Pakistan^{3,4}. Patients suffering from rheumatological disorders are said to experience depression and anxiety more than the general population.^{5,6,7} Studies report that 13-20% of the patients with rheumatoid arthritis suffer from depression. Data from Japan reveal that 39% of rheumatoid arthritis patients are depressed Similarly, data from Spain indicates 33.5% of rheumatoid arthritis patients have co-morbid depressive illness. Previous studies in Pakistan have indicated that about 57% and 42% of the patients with rheumatoid arthritis were suffering from depression.⁹ The present figures are certainly much higher than the international figures of 13-20%.

The present findings do not suggest that diagnosis is related to the depression or anxiety. Studies with larger sample size may be able to identify this difference among different rheumatological disorders. Previous studies have identified different variables in patients with rheumatological disorders that might be associated with depression⁸. The prevalence of depression in patients with other chronic illnesses is also variable, probably for the same reason. However, it is higher than the general population. Factors that might be responsible are physical pain, degree of physical disability, duration of the disease, gender, level of social stress and social support available.

In the present study, depression was found to be more common in females, which can be explained by the added responsibilities ascribed to woman in our society and also due to over representation of depressed females as compared to males. Depression was found to be more common in middle age group as compared to younger patients, as these are carrier making years; disruption in that process may be contributing to the frustration, pessimism and depression. In our study another factor found to be associated with depression is marital status as, more in un married, divorced or separated. It can be explained by society attitudes towards divorced and separated persons. In our study another factor found to be associated with depression is educational status as, more illiterate were found to be more depressed as compared to patients who had higher education. It can be explained by low self esteem, intellect and ability to deal with difficulties is lower in the less educated group as compared to the group with higher level of education. Depression was more common in patients with poor socioeconomic status due to financial constraints, making life generally more difficult regardless of the chronic disease.

Waheed et al. study population consisted mainly of middle aged (mean age 41) females (80.2%). The most common diagnosis was rheumatoid arthritis (57%), followed by systemic lupus erythmatosis (17%) and systemic sclerosis (9%). Permanent joint deformity was present in 33.3% patients and 36.9% patients were suffering from active disease with pain and inflammation. The frequency of anxiety and depression was 65.8%. Educational qualification, permanent joint deformity, active inflammation and time elapsed since diagnosis had significant association with anxiety and depression. Marital Status, gender, economic activity and monthly family income had no effect on the frequency of anxiety and depression.

In another study there were 108 patients mostly females (90%), mean age 44.7 + 11 years, majority (72%) were married and 51% were uneducated. Almost 80% of the patients had rheumatoid arthritis. Two-third of the patients had persistent symptoms. According to the HADS scoring 56% of the patients had more than the cut off score for depression. Regarding the clinical diagnosis, 42% of the patients were found to be depressed. Considering the factors which might be associated with depression or anxiety; only gender was found to be significantly associated with depression ($p=0.03$)^{10,11}.

The chronicity and clinical fluctuations of disease as well as the ever-present possibility of patient's suffering pain are the possible causes of psychiatric disorders in RA^{12,13}. Physical handicaps that develop in the course of the disease lead to dissatisfaction in the family life and work status of patients, who become socially isolated due to insufficiency to fulfill their aspirations. Additionally, patients become hospital-bound due to their insufficient functional outcomes and unable to sustain themselves, and economic strains and lack of social support lead to depression.

Depression is said to be independent risk factor for work disability in patient with inflammatory rheumatic disorders. A 10% reduction in ability to perform valued activities is followed by a seven-fold increase in depression over the subsequent year. However, depression also precedes increases in disability^{14,15}. Other studies do indicate that reduction in disability has been shown to follow improvement in depression in medical patients, but these findings are not clear in patients of rheumatoid arthritis¹⁶.

Impact of other disease factors like pain, disability, other clinical factors like grip strength need to be evaluated in the presently studied sample. Similarly, psychological factors, like social support, social stresses, life events, reactions of patient's family to his illness and other stresses which have been indicated in other studies need to be evaluated in future studies to see, if they are as significant in our population or some other factors might be responsible for this high psychiatric morbidity in patients with rheumatological disorders. Identifying such factors is likely to result in better management of these patients. The present study may be the source of baseline data for the future researcher to know association of various demographic and clinical variables of rheumatoid arthritis with depression which will be helpful for successful treatment of rheumatoid arthritis.

CONCLUSION

Frequency of depression is high in patients being treated for chronic rheumatological disorders however other etiologies of depression may coexist and have to be carefully excluded. Systematic evaluation of all patients for mood disorders and psychological distress in the rheumatology clinics is highly recommended. Since depressed patients can suffer from longer disability periods, lower quality of life and more inpatient visits, early detection and treatment of depression is very important. A close liaison between rheumatologist and mental health professionals could prove beneficial for these patients.

Author's Contribution:

Concept & Design of Study: Syed Shayan Ali
 Drafting: Munir Hussain
 Data Analysis: Babar Bashir, Jawwad us Salam
 Revisiting Critically: Syed Shayan Ali, Munir Hussain
 Final Approval of version: Syed Shayan Ali

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Kvein TK. Epidemiology and burden of illness of rheumatoid arthritis. *Pharmacoeconomics* 2004;22 (2 Suppl):1-12.
2. Lawrence RC, Helmick CG, Arnett FC, Deyo RA, Felson DT, Giannini EH, et al. Estimates of the prevalence of arthritis and selected musculoskeletal disorders in the United States. *Arthritis Rheum* 1998;41:778-99.
3. Hameed K, Gibson T, Kadir M, Sultana S, Fatima Z, Syed A, et al. The prevalence of rheumatoid arthritis in affluent and poor urban communities of Pakistan. *Br J Rheumatol* 1995;34:252-6.
4. Farooqi A, Gibson T. Prevalence of the major rheumatic disorders in the adult population of north Pakistan. *Br J Rheumatol* 1998;37:491-5.
5. World Health Organization: Mental health new understanding new hope. World health report. Geneva: WHO; 2001.
6. Dickens C, Creed F. Depression burden in patients with rheumatoid arthritis. *Rheumatol* 2001; 40:1327-30.
7. DiMatteo MR, Lepper HS, Croghan TW. Depression is a risk factor for non-compliance with medical treatment: meta-analysis of the effects of the anxiety and depression on patient adherence. *Arch Int Med* 2000;160:2101-7.
8. Ohayon MM, Schatzberg AF. Using chronic pain to predict depressive morbidity in the general population. *Arch of Gen Psychiatr* 2003;60:39-47.
9. Azad N, Gondal M, Abbas N. Frequency of Depression and Anxiety in Patients Attending a Rheumatology Clinic. *J Coll Physicians Surg Pak* 2008;18(9):569-73.
10. Covic T, Cumming SR, Pallant JF. Depression and anxiety in patients with rheumatoid arthritis: prevalence rates based on a comparison of the Depression, Anxiety and Stress Scale (DASS) and the hospital, Anxiety and Depression Scale (HADS). *BMC Psychiatr* 2012;12:6.
11. Gettings L. Psychological well being in rheumatoid arthritis: a review of the literature. *Musculoskeletal Care* 2010;8:99-106.
12. Dickens C, McGowan L, Clark-Carter D, Creed F. Depression in rheumatoid arthritis: a systematic review of the literature with meta-analysis. *Psychosom Med* 2002;64:52.
13. Covic T, Tyson G, Spencer D, Howe G. Depression in rheumatoid arthritis patients: demographic, clinical, and psychological predictors. *J Psychosom Res* 2006;60:469-476.
14. Wolfe F, Michaud K. Predicting depression in rheumatoid arthritis: The signal importance of pain extent and fatigue, and comorbidity. *Arthritis Care Res* 2009;61:667-673.
15. Sheehy C, Murphy E, Barry M. Depression in rheumatoid arthritis--underscoring the problem. *Rheumatol* 2006;45:1325.
16. Zautra A, Parrish B, Van Puymbroeck C, Tennen H, Davis M, Reich J, et al. Depression history, stress, and pain in rheumatoid arthritis patients. *J Behav Med* 2007;30:187-197.

Prevalence of Complications of Tuberculous Meningitis in Patients Presenting to Paediatric Department

Muhammad Qasim Khan¹, Kiramat Ullah Wazir¹, Sajjad Ali² and Muhammad Fazil¹

ABSTRACT

Objective: To determine the prevalence of complications in patients presenting with tuberculous meningitis.

Study Design: Descriptive / case series study.

Place and Duration of Study: This study was conducted at the Pediatrics Unit, Mardan Medical Complex, Mardan from 22 February 2015 to 21 February 2017.

Materials and Methods: A total of 50 diagnosed cases of tuberculous meningitis were enrolled. Common presenting clinical features and Complications of TBM were recorded and analyzed.

Results: Out of 50 patients 32 (64 %) were male and 18 (36%) were females. Mean age was 07.35 ± 3.0208 S.D years. Presenting features included fever, vomiting, meningism, neurological deficits, altered level of consciousness and failure to thrive. Only 33 (66%) had available records on immunization and they all had received BCG vaccination. Common complications of TBM included Neurological sequelae 26 (52%), Hyponatraemia 25 (50%), Hydrocephalus 24 (48%) Epileptic seizure 24 (48%) Stroke 16 (32%) Cranial nerve palsies 13 (26%), Diabetes insipidus 04 (08%) Tuberculoma 03 (06%) Myeloradiculopathy 02 (04%), Hypothalamic syndrome 01 (02%) and Mortality 06 (12%),

Conclusion: Tubercular meningitis is associated with significant neurological and systemic complications. Early diagnosis, timely recognition of complications and institution of antituberculous treatment strategies may reduce mortality and morbidity

Key Words: Tuberculosis meningitis, complications. Central nervous system tuberculosis,

Citation of articles: Khan MQ Wazir KU, Ali S, Fazil M. Prevalence of Complications of Tuberculous Meningitis in Patients Presenting to Paediatric Department. Med Forum 2018;29(9):44-48.

INTRODUCTION

Tuberculosis (TB) is an important cause of morbidity and mortality worldwide.¹ The World Health Organization (WHO) estimated the prevalence of tuberculosis to be 442 per 100,000 population and incidence to be 234 per 100,000 population. Estimated mortality rate was 46 per 100,000 population.² Tuberculous meningitis (TBM) accounts for approximately 1% of all forms of tuberculosis and 5.1% of extrapulmonary tuberculosis.^{3,4}

Tuberculous meningitis (TBM) is the most severe complication of tuberculosis and frequently occurs in childhood.⁵ TBM is the most severe form of tuberculosis, with high rates of disability and death.⁶ It carries a risk of fatal outcome or severe neurological deficit, especially when the diagnosis and treatment are

delayed.⁷ TBM is a chronic serious illness with varied presentation and relatively high mortality and morbidity.⁹ It is commonly considered a disease of developing nations, the burden of disease in developed nations is increasing. Young children, in particular, are the most susceptible to tuberculous meningitis (TBM).^{8,9}

A study showed common characteristics i.e. young age (<5 years), nonspecific symptoms existing for >1 week, stage II or III tuberculous meningitis, loss of consciousness, poor weight gain or weight loss, , meningeal irritation, motor deficit, raised intracranial pressure, cranial nerve palsies and brainstem dysfunction. Common features of tuberculous meningitis on CT scan of the brain were hydrocephalus, basal meningeal enhancement, infarctions, and periventricular lucency.⁵

The objective and rationale behind doing this study was to determine the frequency of complications of TBM in patients presenting with illness duration of > 4 weeks, hydrocephalus, cranial nerve palsy, Glasgow coma score of < 7, and hemiplegia. This study gave us insight to the local trend of complications of TBM in the pediatric population and on the basis of results of this study, recommendations were suggested regarding regular screening and in time management of all patients with TBM as these complications act as

¹. Department of Paediatrics / Pulmonology², MTI, Mardan Medical Complex, Mardan.

Correspondence: Dr. Muhammad Qasim Khan, Assistant Professor of Paediatrics, MTI, Mardan Medical Complex, Mardan.

Contact No: 0333-9205167

Email: qasimkhan.dr.02@gmail.com

markers of poor outcome in patients with TBM and this study was also open more research questions regarding complications associated with disease.

MATERIALS AND METHODS

This descriptive case series was conducted in the Paediatrics Unit, Mardan Medical Complex, Mardan; a tertiary care hospital and was completed in One year period. A total of 50 patients were selected for the study with convenient (non-probability) sampling technique following the inclusion criteria; all patients with diagnosed tuberculous meningitis (diagnosed on clinical examination and were confirm on CT Scan) presenting with illness duration of > 4 weeks, hydrocephalus, cranial nerve palsy, Glasgow coma score of < 7 and hemiplegia, of both sexes, aged from 01 to 12 years. Already diagnosed cases of tuberculous meningitis, cases having bacterial, viral meningitis and cerebral malaria, cases having co-morbid conditions like acute respiratory infections, urinary tract infections, and enteric fever, which require antibiotic therapy were excluded from the study.

Data Collection Procedure: After getting approval from the hospital ethical committee to conduct the study, data was collected of all those patients with tuberculous meningitis (diagnosed on clinical examination and were confirm on CT Scan) presenting with illness duration of > 4 weeks, hydrocephalus, cranial nerve palsy, Glasgow coma score of < 7 and hemiplegia, to the Out-patient department (OPD) or Emergency department were admitted in Paediatrics Unit, of Mardan Medical Complex, Mardan. Patients who were fulfilling the inclusion criteria were included in the study. An informed written consent was taken from parents or relatives of the patients for further evaluation. After inclusion in the study, the patients were evaluated by clinical examination and laboratory tests including cerebrospinal fluid (CSF) analysis findings, tuberculin skin test; and other clinical specimens positive for acid-fast bacilli and computed tomography (CT) scan brain. Radiological evaluation was included CT scan compatible with TBM; and chest radiography compatible with primary tuberculosis. Complications of TBM in patients presenting with illness duration of > 4 weeks, hydrocephalus, cranial nerve palsy, Glasgow coma score of < 7 and hemiplegia were recorded and then these were noted down into the proforma of the study.

All the qualitative variables like illness duration of > 4 weeks, hydrocephalus, cranial nerve palsy, Glasgow coma score of < 7, hemiplegia and death were analyzed for percentages and frequencies. Mean \pm standard deviation was calculated for quantitative variables like age. For gender, male to female ratio was calculated. The results were presented through tables, graphs and charts. All the data was stored and analyzed by statistical program SPSS version 12 for windows.

RESULTS

A total of 50 children with TBM admitted to Pasediatrics Unit, Mardan Medical Complex, Mardan during the study period. The mean age was 07.3500 ± 3.02083 (S.D) years, ranging from 01 to 12 years. The male to female ratio was 1.77:1 (Table 1).

Table No. 1: Various demographic features of cases (n=50)

Variables	Frequency	Percentage
Age:		
01 - 05 years	09	18%
06 - 10 years	26	52%
11 - 12 years	15	30%
Sex:		
Male	32	64%
Female	18	36%

Table No. 2: Various features at presentation (n=50)

Presentation	Frequency	%age
History of Fever	50	100%
Temperature above 37.50 °C	44	88%
Altered level of consciousness	19	38%
Convulsions	38	76%
Irritability	39	78%
Poor feeding	37	74%
TB contact	25	50%
Headache	49	98%
Vomiting	39	78%
Cough	41	82%
Difficulty in breathing	15	30%
Failure to thrive	44	88%
Meningism	37	74%
Bulging fontanelle	28	56%
Neurological deficits	38	76%
TBM stage 1	31	62%
TBM stage 2	14	28%
TBM stage 3	05	10%
History of BCG immunization done	33	66%

Common features included vomiting, neurological deficits, meningism, altered level of consciousness fever, and failure to thrive. Although 45 (90%) had a history of fever, and 05 (10%) had a normal temperature at admission. Of the 50, 19 (38%) with data on level of consciousness, only 31 (62%) had a record on the Glasgow coma scale. Out of these 50, 31 (62%) had TBM stage 1, 13 (26%) had TBM stage 2 and 06 (12%) had TBM stage 3.

According to the patient's attendants, only 33 (66%) had received BCG vaccination as they had records of immunization (Table 2).

The CSF protein concentration was done in 50 (100%) children. CSF glucose below 3.0 mmol/l was in 46 (92%) patients. To make a diagnosis of tuberculosis,

other tests including sputum smear and culture, chest X-rays, Mantoux test, CT and MRI are detailed in table 3.

Complications of TBM i.e. neurological sequelae, hyponatraemia, hydrocephalus, stroke, cranial nerve palsies, epileptic seizures, diabetes insipidus, tuberculoma, myeloradiculopathy, and hypothalamic syndrome are mentioned in table 4.

Table No. 3: Cerebrospinal fluid findings and other TB investigations (n=50)

Cerebrospinal fluid findings	Frequency	%age
CSF TB culture positive	14	28%
AAFBs negative	50	100%
Raised proteins concentration >0.4g/l	46	92%
Increased cell count >5cells/mm ³	45	90%
Lymphocyte predominance	46	83%
Neutrophil predominance	11	22%
Other TB Investigation		
Mantoux test reactive	31	62%
Chest X-ray suggestive of TB.	35	70%
TB sputum culture positive.	09	18%
TB sputum smear negative	50	100%
CT/MRI results		
Basal meningeal enhancement	28	56%
Hydrocephalus	24	48%
Cerebral infarcts	19	38%
Cerebral oedema	17	35%
Normal	13	16%

Table No. 4: Complications of TBM (n=50)

Complications	Frequency	%age
Neurological sequelae	26	52%
Hyponatraemia	25	50%
Hydrocephalus	24	48%
Epileptic seizure	24	48%
Stroke	16	32%
Cranial nerve palsies	13	26%
Mortality	06	12%
Diabetes insipidus	04	08%
Tuberculoma	03	06%
Myeloradiculopathy	02	04%
Hypothalamic syndrome	01	02%

DISCUSSION

Tuberculous meningitis (TBM) is usually a progressive disorder and the diagnosis is difficult especially in regions with poor resources.¹⁰

TBM risk is greatest for infants and children under 2 years of age, probably due to the immaturity of the immune system.¹¹ The disease can occur at any age but is uncommon in children younger than 6 months and rare in those who are younger than 3 months of age. The peak incidence in a study was found during adolescence in the age group of 11 to 16 years (43%),

followed by 31.8% cases in the age group of 6-10 years. Youngest was 3 months old. Higher incidence was observed by Malla et al¹² in the similar age group 10-16 years (70%). Similarly in our study peak incidence was found in 06-10 years with mean age of 07.35 ± 3.02 (S.D.) which could be due to reason that we have selected children from 01 year to 12 years old.

The results of another study showed that majority (67%) of children were less than 5 years old.¹³ In a study from India, out of 44 patients with TBM it has been observed that 45% were male and 55% were female with a male to female ratio of 0.8:1.¹⁴ In another study, 56% of patients were males.¹³ Results of our study also showed that majority (67%) children were males, with a male to female ratio of 0.177:0.1. This may be due to reasons that the socio-cultural customs and rules of the region are against the female children, which are neglected in every aspect even if they are very sick they are not brought to male doctors for treatment.

In a study fever was present in 100% of patients followed by altered sensorium, present in 54.5%. Vomiting in 50%, headache in 45.4%, seizures 40.9% cases. Cough present in only 27.2% patients. Abdominal pain (11.3%), altered bowel habits (2.2%), loose motion (2.2%). Other neurological deficit found was loss of speech in 6.8%, right sided weakness 4.5%, diplopia 2.2%, blurred vision 2.2%.¹⁴ Similarly in our study common features like vomiting, meningism, fever, neurological deficits, failure to thrive and altered levels of consciousness were present with more or less percentages were present in patients having TBM.

In a study,¹⁴ in 93% patients consciousness was altered at presentation, out of which 40.9% were drowsy at presentation, 36.3% patients were unconscious at presentation, 15.9% were irritable. Signs of meningeal irritation were present in 79.5%. Cranial nerve involved in the referenced study was optic (4.5%), ophthalmic (9%), abducens (31.8%), facial (13.6%), glossopharyngeal and vagus nerve (2.2%). Abducens nerve involvement was most common. Fundus was normal in 45.4% patients, Edema was found in 29.5%, atrophy in only 2.2%. Motor involvement in form of hemiplegia was found in only 2 patients. No case with quadriplegia was found. Tender lymphadenopathy was present in 2 patients. Same or more or less percentages of signs were also present in our patients at presentation.

In a study¹⁵ TBM was present in only 15% cases. Results of our study showed that CSF TB culture was positive in 29% cases, AAFBs was negative in 100% patients, while raised proteins concentration of >0.4g/l was found in 91% patients of TBM. Other tests for the diagnosis of tuberculosis i.e. chest X-rays, sputum smear and culture, Mantoux test, MRI and CT scan were done to confirm the TBM as early as possible.

There are three main factors in delay of diagnosis and treatment of TBM. First, poverty is a barrier to

accessing health care in resources scarce countries. Secondly, TBM presents in a distracted method and it is uncommon to verify the diagnosis microbiologically even in high resource settings.¹³ Improving laboratory training and infrastructure, and improving access to WHO endorsed technologies such as the GeneXpert, would potentially reduce this delay but will not alter the fact that clinical specimens from children are limited both by their volume and their paucibacillary nature.¹⁶ An adequate volume of CSF significantly affects the likelihood of confirming the diagnosis and appropriate sampling for TB at other sites should be performed. Moreover, while TB diagnostic tests remain poorly sensitive, increasing the capacity to recognize and keep out other central nervous system pathogens, is key in giving clinicians the confidence to initiate a timely treatment and which reduce unnecessary prescription of lengthy TB regimens.¹⁷

Tuberculous meningitis in children carries significant morbidity and mortality.¹³ The mortality ranges from 13% to 69% even in developed countries.¹⁸⁻²¹ In the aforesaid study, the better outcome may be because all 37 patients had the records of date of starting anti-TB treatment (ATT) and had started treatment within 3 days of admission. Early initiation of treatment has been recognized as the main predictive factor which predicts disease lethality and sequelae.²⁰ The another study²² showed that overall mortality was 28% in cases of TBM. In our study mortality rate was 11%, which is within the range as mentioned in the literature.

Seizure is one of the clinical feature or complication of meningitis. In the first few days of bacterial meningitis, seizures occur in about 25% cases.²³

Common and important causes of mortality and long-term morbidity were neurological and systemic complications of tuberculous meningitis. Hydrocephalus is a common complication of TBM; prevalence has been reported in more than 75% of cases in literature review.²⁴

Hyponatremia occurs in 35-65% of patients with tuberculous meningitis and is an independent predictor of death or severe disability.²⁵ There are many factors which are responsible for the complications of TBM like delay presentation to specialist hospitals of city, our illiterate and uneducated peoples first contact hakeems, quacks, non-qualified, and spiritual healers and peers. Poverty is another factor which hinders for seeking medical treatment in this poor part of the country. There are no facilities of diagnosis of TBM in many districts and agency headquarters hospitals in the province of KPK. Which enhances the burden of the TBM in this poor resources province of the country.

CONCLUSION

Earlier investigations and diagnosis of TBM and treatment may be able to prevent these complications. If

left untreated, TBM can be life threaten. The proper BCG vaccination can help to prevent TBM in young children living in places where this disease is more common.

Author's Contribution:

Concept & Design of Study:	Muhammad Qasim Khan
Drafting:	Kiramat Ullah Wazir
Data Analysis:	Sajjad Ali, Muhammad Fazil
Revisiting Critically:	Muhammad Qasim Khan, Kiramat Ullah Wazir
Final Approval of version:	Muhammad Qasim Khan

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Khurshid R, Shore N, Saleem M, Naz M, Zameer N. Diagnostic significance of adenosine deaminase in pleural tuberculosis. *Pak J Physiol* 2007;3:1-3.
2. World Health Organization (WHO), Global Tuberculosis Report. 2013, WHO, Geneva, Switzerland; 2013.
3. Phipers M, Harris T, Power C. CNS tuberculosis: a longitudinal analysis of epidemiological and clinical features. *Intern J Tubercul Lung Dis* 2006; 10:99-103.
4. Center for Diseases Control (CDC). Reported Tuberculosis in the United States, 2013, CDC, Atlanta, GA, USA, 2014.
5. van Well GT, Paes BF, Terwee CB, Springer P, Roord JJ, Donald PR, et al. Twenty years of pediatric tuberculous meningitis: a retrospective cohort study in the western cape of South Africa. *Pediatr* 2009;123:e1-8.
6. Thwaites GE, van Toorn R, Schoeman J. Tuberculous meningitis: more questions, still too few answers. *Lancet Neurol* 2013;12:999-1010.
7. Khan DA, Rahman A, Khan FA, Najmal-ul-Hassan. Comparison of serum procalcitonin and C-reactive protein in diagnosis of bacterial meningitis. *Pak Armed Forces Med J* 2009;59: 159-64.
8. van den Bos F, Terken M, Ypma L, Kimpen JLL, Nel ED, Schaaf HS, et al. Tuberculous meningitis and miliary tuberculosis in young children. *Trop Med Int Health* 2004;9:309-13.
9. Yaramis A, Bükte Y, Katar S, Özbek MN. Chest computerized tomography scan findings in 74 children with tuberculous meningitis in southeastern Turkey. *Turkish J Pediatr* 2007; 49:365-9.
10. Moghtaderi A, Alavi-Naini R, Rashki S. Cranial nerve palsy as a factor to differentiate tuberculous meningitis from acute bacterial meningitis. *Acta Medica Iranica* 2013;51:113-8.

11. Marais BJ, Gie RP, Schaaf HS, Hesselning AC, Obihara CC, Starke JJ, et al. The natural history of childhood intra-thoracic tuberculosis: a critical review of literature from the pre-chemotherapy era. *Int J Tuberc Lung Dis* 2004;8:392-402.
12. Malla K, Rao KS, Malla T, Vedamony J, Ghimire P. Role of cerebrospinal fluid adenosine deaminase level in early diagnosis of various etiologies of meningitis in children. *Nepal J Med Sci* 2012;1: 97-102.
13. Bang ND, Caws M, Truc TT, Duong TN, Dung NH, Ha DTM, et al. Clinical presentations, diagnosis, mortality and prognostic markers of tuberculous meningitis in Vietnamese children: a prospective descriptive study. *BMC Infect Dis* 2016;16:573.
14. Goyal G, Arya AK. Clinical and laboratory profile of children with tubercular meningitis admitted in tertiary care centre of Kumaun region, Uttarakhand, India. *Int J Contemp Pediatr* 2017;4:116-22.
15. Marais S, Thwaites G, Marais JB, Török ME, Misra UK, Prasad K, et al. Tuberculous meningitis: a uniform case definition for use in clinical research. *Lancet Infect Dis* 2010;10:803-12.
16. Nhu NT, Heemskerk D, Thu do DA, Chau TT, Mai NT, Nghia HD, et al. Evaluation of GeneXpert MTB/RIF for diagnosis of tuberculous meningitis. *J Clin Microbiol* 2014;52:226-33.
17. Thwaites GE, Chau TT, Farrar JJ. Improving the bacteriological diagnosis of tuberculous meningitis. *J Clin Microbiol* 2004;42:378-9.
18. GERMS-South Africa Surveillance Report, South Africa. Bacterial and fungal meningitis amongst children <5years, South Africa 2007.
19. Farinha NJ, Razali KA, Holzel H, Morgan G, Novelli VM. Tuberculosis of the central nervous system in children: a 20-year survey. *J Infect* 2000;41:61-8.
20. Anne-Sophie Christensen H, Åse Andersen B, Isik Johansen S, et al. Tuberculous meningitis in Denmark: a review of 50 cases. *BMC Infect Dis* 2011;11:47.
21. Padayatchi N, Bamber S, Bobat R. Multidrug-resistant tuberculous meningitis in children in Durban, South Africa. *Pediatr Infect Dis J* 2006; 25: 147-50.
22. Inamdar P, Masavkar S, Shanbag P. Hyponatremia in children with tuberculous meningitis: A hospital-based cohort study. *J Pediatr Neurosci* 2016;11:182-7.
23. Moghtaderi A, Alavi-Naini R, Rashki S. cranial nerve palsy as a factor to differentiate tuberculous meningitis from acute bacterial meningitis. *Acta Medica Iranica* 2013;51:113-8.
24. Marx GE, Chan ED. Tuberculous meningitis: diagnosis and treatment overview. *Tuberc Res Treat* 2011;1-9.
25. Gujjar AR. Sodium dysregulation and infections of central nervous system. *Ann Indian Acad Neurol* 2003;6:253-8.

Comparison of Awareness and Knowledge of Oral Cancer Among Medical and Dental Undergraduate Students in Bacha Khan Medical College, Mardan

Muhammad Naeem¹, Shakeel Anwar² and Munib Muhammad³

ABSTRACT

Objective: The aim of the study was to compare the awareness and knowledge of oral cancer among medical and dental undergraduate students in Bacha Khan Medical College, Mardan.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Community and Preventive Dentistry, Dental Section, Bacha Khan Medical college, Mardan from January 2017 to December 2017.

Materials and Methods: The cross-sectional survey was performed among final year dental and medical students, house officers of BDS and MBBS. The pre-structured questionnaire about ways of improving prevention, early detection and referral of oral cancer patients was circulated among 120 participants. These questions were paying attention on familiarity of the main risk factors and treatment options of oral cancer. The analysis of collected data were done using SPSS version 20.0. Descriptive statistics were calculated. Pearson Chi- square (χ^2) test was applied to compare the responses of oral cancer among the four categories of participants. P-value less 0.05 was considered.

Results: The mean age of the sample was 24.208 ± 1.083 years. In final year group (both BDS and MBBS) females were than males while the results were opposite for house offices groups. Less than half of the participants (46.67%) were routinely examined oral mucosa. Majorities of the participants reported that they had insufficient knowledge. The final year BDS student were statistically more aware than final year MBBS students about oral cancer ($P < 0.005$) except changes within the mouth would they associate with oral cancer, cancer consultation, and an opportunity to examine patients with oral lesions. Similarly, house officers of dentistry were aware than medical about oral cancer ($P < 0.05$).

Conclusion: This study stress for the need to improve the curriculum and clinical training in oral cancer of dental and medical institutes of our country.

Key Words: Oral cancer, knowledge, undergraduate, medical students, dental students

Citation of articles: Naeem M, Anwar S, Muhammad M. Comparison of Awareness and Knowledge of Oral Cancer Among Medical and Dental Undergraduate Students in Bacha Khan Medical College, Mardan. Med Forum 2018;29(9):49-53.

INTRODUCTION

Squamous cell carcinoma of the head and neck is the 6th commonest neoplasm in men and records for around 5% of every single malignant tumor in developing countries.¹ Incidence rates are substantially higher in developing areas like Southeast Asia, where they represent up to 50 % of all malignant tumors.²

¹. Department of Community and Preventive Dentistry, Dental Section, Bacha Khan Medical College Mardan KPK.

². Department of Community and Preventive Dentistry, Khyber College of Dentistry Peshawar KPK.

³. Department of Community Medicine, Saidu Medical College Swat KPK.

Correspondence: Dr. Muhammad Naeem, Assistant Professor Community and Preventive Dentistry, Dental Section, Bacha Khan Medical College Mardan, KPK.

Contact No: 03025919540

Email: dr.naeemneelavi@gmail.com

Oral squamous cell carcinoma has diverse clinical features and several forms of presentation. After surgical resection of the tumors the quality of life of the affected patients is very poor due to functional and esthetic reasons.³ If the oral cancer is early diagnosed the patients will have good prognosis. Dental practitioners are the first to see patients having oral cancer so awareness of these clinicians have a prime role to detect early and will improve the prognosis of this malignancy.⁴

Numerous patients who have gotten the effective treatment for oral malignancy may need to confront some functional and esthetic mutilation that has trouble in mastication, deglutination, phonation and disfigurement. The treatment of oral squamous cell carcinoma can affect the quality of life badly.⁵ The recognition of oral malignancy at a initial period of the onset is the best methods for enhancing survival and reduces the morbidity, distortion and even the related social insurance costs.⁶ Most of the cases of oral cancer

patients are asymptomatic, so lack of awareness of knowledge leads to non-presentation to treatment.⁴

Kujan et al.² performed a research on Saudi Arabian undergraduate dental students. Questions were asked pertaining to understanding, risk factors, and views on prevention and practices of oral cancer. Eighty-one percent of respondents were aware about oral carcinoma and 87% of respondents reported that they were competent in systematic oral examination to found the suspicion of oral malignancy. Fascinatingly, 57 % of participants had observed the use of diagnostics tools of oral cancer. Another study on Indian population reported that the knowledge of oral cancer was good. Females were aware than males. The participant's awareness about risk factors of oral cancer was not satisfactory.⁷

Lack of adequate knowledge in training pose hindrance to recognized these lesions and consequently leads to delay in diagnosis. Prognosis is far better if diagnosis is done early.⁸ Knowledge regarding the oral cancer among the dental students of undergraduate has been well accepted, but there is scarcity of knowledge among undergraduate medical and dental students in Mardan. To our knowledge no study has been traced in Pakistan to compare the knowledge of medical and dental students about oral cancer.

MATERIALS AND METHODS

The cross-sectional survey was performed between January 2017 to December 2017 among final year dental and medical students, house officers of BDS and MBBS of Bacha Khan Medical college, Mardan. Total participants were 120 each group consist of 30. The pre-structured questionnaire was circulated among the final year's students and house officers of BDS and MBBS. Pamphlet containing information about the aim of the study was also given. All the participants were ensured about the confidentialities of their data to ensure the return of questionnaire. Response rate was 100%.

Main aim of the questionnaire was to gain information from these participants about ways of improving prevention, early detection and referral of oral cancer patients. Section 1 consists of questions about to participant demographics and designation. Section 2 contained 10 questions which were both open and close ended. These questions were paying attention on familiarity of the main risk factors and treatment options of oral cancer.

The analysis of collected data were done using SPSS version 20.0. Frequencies and percentages were calculated for all qualitative variables like gender, questions regarding oral cancer. Mean and standard deviation were computed for numerical variable like age. Pearson Chi-square (χ^2) test was applied to compare the responses of oral cancer among the four categories of participants. P-value less than 0.05 was considered significant.

RESULTS

The mean age of the sample was 24.208 ± 1.083 years. The age range was from 22 to 26 years. The males were 53(44.2%) and females were 67(55.8%). In each group (final years and House officer of MBBS and BDS) 30 participants were selected. In final year group(both BDS and MBBS) female were than males while the results were opposite for house offices groups. (Fig 1) Less than half of the participants(46.67%) were routinely examined oral mucosa. Of total, 62.5% the participants reported that they screen the high risk patients for oral cancer. The mostly common reported risk factors for oral cancer were smoking(42.5%) and chronic irritation (39.17%). Seven eight (78%) participants reported that they advised the patients who had risk factor for oral cancer to quit these. Majorities medical and dental students (71.67%) reported that they opportunity for oral lesions examination. More than half of the participants (54.17%) were well inform about appearance of oral cancer and 39.17% were poorly informed. Most of the participants associated oral cancer with white lesions(52.5%) and color change(27.5%).Majorities of the participants reported that they will consult the oral cancer patients to dentists. The most common specialists to which the referral should be done was maxillofacialsurgeon (n=61, 50.83%) and Oncologist (n=44, 36.67%). Majorities of the participants reported that they had insufficient knowledge. (Table 1)

The final year BDS student were statistically more aware than final year MBBS students about oral cancer ($P < 0.005$) except changes within the mouth would they associate with oral cancer, cancer consultation, and an opportunity to examine patients with oral lesions. (Table 2) Similarly, dental house officers were more aware than medical house officers about oral cancer ($P < 0.05$). The details are given in the table 3.

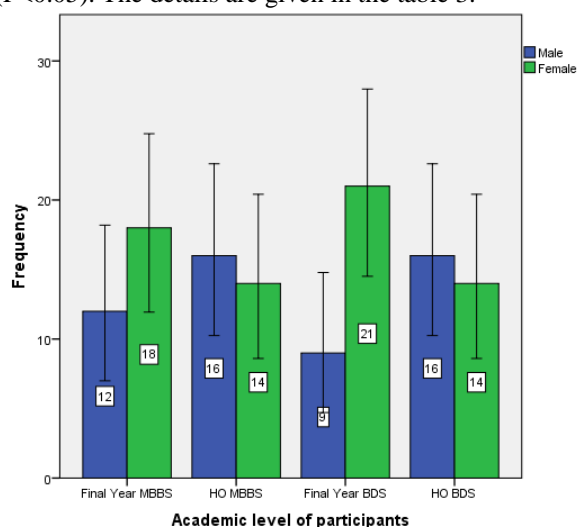


Figure No.1: Qualification level of the participants

Table 1: Awareness and knowledge about oral cancer all participants

Awareness of participants about oral cancer		Count	%
Do you examine patient's oral mucosa routinely?	Yes	56	46.67
	No	64	53.33
Do you screen the oral mucosa if the patients are in high risk categories?	Yes	75	62.5
	No	45	37.5
What do you consider high risk factor for oral cancer?	Snuff Dipping	22	18.33
	Smoking	51	42.5
	chronic irritation	47	39.17
Do you advise patients about risk factor for oral cancer?	Yes	78	65
	No	42	35
Have you an opportunity to examine patients with oral lesions?	Yes	86	71.67
	No	34	28.33
How much you know the clinical appearance of oral cancer?	Very well	8	6.667
	Well inform	65	54.17
	Poorly	47	39.17
What changes within the mouth would you associate with oral cancer?	White lesion	63	52.5
	Red Lesion	17	14.17
	Color change	33	27.5
	Pigmentation	7	5.833
Where should patients with oral cancer consult?	Dentist	101	84.17
	Medical doctor	19	15.83
Where would you refer a patient if suspect an oral malignancy?	Plastic Surgeon	0	0
	ENT surgeon	15	12.5
	Maxillofacial surgeon	61	50.83
	General Practitioner	0	0
	Oncologist	44	36.67
Do you feel that you have sufficient knowledge concerning of prevention and detection of oral cancer?	Yes	50	41.67
	No	70	58.33

Table No.2: Comparison of awareness about oral cancer among final BDS and MBBS students

Awareness of participants about oral cancer		Final Year MBBS	Final Year BDS	p-value
		Count	Count	
Do you examine patient's oral mucosa routinely?	Yes	0	27	0.000
	No	30	3	
Do you screen the oral mucosa if the patients are in high riskcategories?	Yes	9	22	0.001
	No	21	8	
what do you consider high risk factor for oral cancer?	Snuff Dipping	4	0	0.011
	Smoking	21	16	
	chronic irritation	5	14	
Do you advise patients about risk factor for oral cancer?	Yes	26	15	0.002
	No	4	15	
Have you an opportunity to examine patients with oral lesions?	Yes	17	24	0.052
	No	13	6	
How much you know the clinical appearance of oral cancer?	Very well	4	0	0.000
	Well inform	12	30	
	Poorly	14	0	
What changes within the mouth would you associate with oral cancer?	White lesion	16	15	0.203
	Red Lesion	0	0	
	Color change	14	12	
	Pigmentation	0	3	
Where should patients with oral cancer consult?	Dentist	26	27	0.688
	Medical doctor	4	3	
Where would you refer a patient if suspect an oral malignancy?	Plastic Surgeon	0	0	0.000
	ENT surgeon	8	0	
	Maxillofacial surgeon	8	23	
	General Practitioner	0	0	
	Oncologist	14	7	
Do you feel that you have sufficient knowledge concerning of prevention and detection of oral cancer?	Yes	4	23	0.000
	No	26	7	
	No	26	11	

Table No.3: Comparison of awareness about oral cancer among BDS and MBBS House officer

Awareness of participants about oral cancer		HO MBBS Count	HO BDS Count	p-value
Do you examine patient's oral mucosa routinely?	Yes	3	26	0.000
	No	27	4	
Do you screen the oral mucosa if the patients are in high risk categories?	Yes	14	30	0.000
	No	16	0	
what do you consider high risk factor for oral cancer?	Snuff Dipping	11	7	0.005
	Smoking	11	3	
	chronic irritation	8	20	
Do you advise patients about risk factor for oral cancer?	Yes	15	22	0.06
	No	15	8	
Have you an opportunity to examine patients with oral lesions?	Yes	15	30	0.000
	No	15	0	
How much you know the clinical appearance of oral cancer?	Very well	4	0	0.000
	Well inform	0	23	
	Poorly	26	7	
What changes within the mouth would you associate with oral cancer?	White lesion	12	20	0.004
	Red Lesion	7	10	
	Color change	7	0	
	Pigmentation	4	0	
Where should patients with oral cancer consult?	Dentist	18	30	0.000
	Medical doctor	12	0	
Where would you refer a patient if suspect an oral malignancy?	Plastic Surgeon	0	0	0.016
	ENT surgeon	7	0	
	Maxillofacial surgeon	12	18	
	General Practitioner	0	0	
	Oncologist	11	12	
Do you feel that you have sufficient knowledge concerning of prevention and detection of oral cancer?	Yes	4	19	0.000
	No	26	11	

DISCUSSION

Dentists commonly diagnosed oral cancer. In addition, early diagnosis reduces the morbidity and mortality of this disease.⁹ However, to make feasible the early diagnosis dentists must appreciate cancer of orofacial region as a public health issue. The prime responsibility of the dental institute to make certain the formation of a generalist with solid technical, scientific, humanistic, and ethical knowledge, to promote health, emphasize the philosophy of prevention of oral diseases.¹⁰ Although post-graduation are essential in any field, graduation is necessary and the students must have the relevant basic information to prevent and diagnose early the oral cancer.¹¹ Hence, this study sought to assess oral cancer awareness among the dental and medical students of Bach Khan Medical college, Mardan. A questionnaire previously published by Makhdoom et al.¹² was used in this survey type study. The response rate of the current study was excellent (100%). Since the response rates of different groups were same, it was possible to compare the results. This study has some limitations such as applying students' perception to assess students' knowledge regarding oral

cancer risk factors and appearances. The number of questions was kept to a minimum to encourage the responses and appeared to work well when previously employed.

The findings of the current study showed that there was on the whole shortage in oral cancer awareness and knowledge among the undergraduate medical and dental students. These results of undergraduate dental students were in consistent to students in the United Kingdom, Canada¹³ and in Peshawar Pakistan.¹²

In the current study most of the participant related oral cancer to smoking and chronic irritation. This is may be due to the fact the smoking and chronic irritations due to snuff dipping and mal-designed removable denture are common in our territory. Similar results were reported by previous studies conducted in Peshawar¹² and Lahore, Pakistan¹⁴.

Less than half of the medical and dental undergraduate routinely examined the oral mucosa routinely for oral cancer. That's may a reason that most oral carcinoma patients appears in late stages of oral cancer and have poor prognosis. These results are in consistent with previous literature.^{12, 14}

Most of the participants associate oral cancer with white lesions and color in oral mucosa. This shows good knowledge among practitioner regarding the clinical appearance of oral cancer, because oral cancer is in many cases preceded by leukoplakia and erythroplakia. Similar findings were reported by Uti et al¹⁵ and Clovis et al.¹⁶

The main focused of this was to compare the knowledge regarding oral cancer among medical and dental undergraduate students. The current results showed that dental students were more aware as compared to medical students. Carter et al.¹⁷ conducted a study on oral cancer awareness of undergraduate medical and dental students at the University of Dundee. Their results supported the current study.

CONCLUSION

This study stressed for the need to improve the curriculum and clinical training in oral cancer of dental and medical institutes of our country. Importance of early diagnosis of oral cancer should be given and included in the curriculum by the Higher Education Commission (HEC) as well as PMDC to make sure that medical and dental students are provided with sound knowledge about this malady.

Author's Contribution:

Concept & Design of Study: Muhammad Naeem
 Drafting: Shakeel Anwar
 Data Analysis: Munib Muhammad
 Revisiting Critically: Muhammad Naeem,
 Shakeel Anwar
 Final Approval of version: Muhammad Naeem

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Rebecca S, Deepa N, Ahmedin J. Cancer statistics, 2012. *Ca Cancer J Clin* 2012;62(1): 10-29.
2. Kujan O, Alzoghaibi I, Azzeghaiby S, Altamimi MA, Tarakji B, Hanouneh S, et al. Knowledge and attitudes of Saudi dental undergraduates on oral cancer. *J Cancer Educ* 2014;29(4):735-8.
3. Gómez I, Warnakulasuriya S, Varela Centelles P, López Jornet P, Suárez Cunqueiro M, Diz Dios P, et al. Is early diagnosis of oral cancer a feasible objective? Who is to blame for diagnostic delay? *Oral Diseases* 2010;16(4):333-42.
4. Formosa J, Jenner R, Nguyen-Thi MD, Stephens C, Wilson C, Ariyawardana A. Awareness and Knowledge of Oral Cancer and Potentially Malignant Oral Disorders among Dental Patients in Far North Queensland, Australia. *Asian Pacific J Cancer Prev* 2015;16(10):4429-34.
5. Chandu A, Smith AC, Rogers SN. Health-related quality of life in oral cancer: a review. *J Oral Maxillofac Surg* 2006;64(3):495-502.
6. Rogers SN, Brown JS, Woolgar JA, Lowe D, Magennis P, Shaw RJ, et al. Survival following primary surgery for oral cancer. *Oral Oncol* 2009;45(3):201-11.
7. FOtedar V, FOtedar S, Gupta M, Manchanda K, SharMa M. Oral Cancer Knowledge, Attitudes and Practices: A Survey of Undergraduate Medical Students in Himachal Pradesh, India. *J Clin Diagn Res* 2015;9(8):XC05-XC8.
8. Ogden GR, Mahboobi N. Oral cancer awareness among undergraduate dental students in Iran. *J Cancer Educ* 2011;26(2):380-5.
9. Farah C, McCullough M. Oral cancer awareness for the general practitioner: new approaches to patient care. *Aust Dent J* 2008;53(1):2-10.
10. Soares TRC, Carvalho MEdA, Pinto LSS, Falcão CA, Matos FTC, Santos TC. Oral cancer knowledge and awareness among dental students. *Braz J Oral Sci* 2014;13(1):28-33.
11. Dib L, Souza R, Tortamano N. Evaluation of the knowledge about oral cancer among undergraduate dental students of different units at University Paulista. *Rev Inst Cienc Saude* 2005;23:287-95.
12. Makhdoom S, Late A. Assessing oral cancer knowledge among dental students, house officers as well as faculty members of Khyber College of Dentistry, Peshawar, Pakistan. *J Khyb Coll Dent* 2012;2(2):58-61.
13. Forrest JL, Horowitz AM, Shmueli Y. Dental hygienists' knowledge, opinions, and practices related to oral and pharyngeal cancer risk assessment. *J Dent Hyg* 2001;75(4):271-81.
14. Kazmi F, Chaudhary MA, Mumtaz M, Bhatti MUD, Khawaja N. Oral cancer knowledge and awareness amongst undergraduate dental students of Lahore-Pakistan. *Pak Oral Dent J* 2011;31(1):64-7.
15. Uti OG, Fashina A. Oral cancer education in dental schools: knowledge and experience of Nigerian undergraduate students. *J Dent Educ* 2006;70(6):676-80.
16. Clovis JB, Horowitz AM, Poel DH. Oral and pharyngeal cancer: knowledge and opinions of dentists in British Columbia and Nova Scotia. *J Can Dent Assoc* 2002; 68: 415-20.
17. Carter LM, Ogden GR. Oral cancer awareness of undergraduate medical and dental students. *BMC Med Educ* 2007;7(1):44-50.

Evaluation of Stroke in Diabetic and Non-Diabetic Patients

Syed Qaiser Husain Naqvi¹, Shamsuddin Shaikh² and Jawaid Hussain Lighari³

ABSTRACT

Objective: To determine the frequency and mortality rate of stroke and its types in diabetic and non-diabetic patients of rural Sindh.

Study Design: Descriptive / Observational study

Place and Duration of Study: This study was conducted at the medical ward and out patient's department, Peoples University of Medical and Health Sciences, Nawabshah from January 2016 to December 2016.

Materials and Methods: This descriptive observational study was conducted on 74 cases of stroke. The patients were collected from medical ward and out patient's department of Peoples Medical College Hospital as well as private clinics, 74 patients of acute stroke fulfilling the inclusion/exclusion criteria were included in the study. The clinical and demographic data obtained was collected on a proforma and results were tabulated.

Results: 74 cases of stroke including 48 (64.9%) males were evaluated. Diabetes was diagnosed in 43 (58.1%) cases, among these 74 cases 53 (71.6%) cases having ischemic stroke and 21 (28.4%) having hemorrhagic stroke. Majority of diabetic patients were male and having ischemic stroke. 06 (8.1%) non-diabetic cases died, majority of them were male with ischemic stroke, and 14 (18.9%) diabetic cases died among them majority were male having hemorrhagic stroke. As a whole 54 cases survive and the survival rate was more in patients of ischemic stroke.

Conclusion: The ischemic strokes are more prevalent than hemorrhagic strokes especially in diabetic patients. The mortality rate was worse in cases of diabetes especially in hemorrhagic strokes. There is a need of early diagnosis and treatment of diabetes to avoid stroke and to improve prognosis in stroke.

Key Words: Mortality, Ischemic stroke, hemorrhagic stroke, Diabetes.

Citation of articles: Naqvi SQH, Shaikh S, Lighari JH. Evaluation of Stroke in Diabetic and Non-Diabetic Patients. Med Forum 2018;29(9):54-57.

INTRODUCTION

Over the last three decades the global stroke mortality rate has decreased but the incidence of stroke is continuously increasing^{1,2}. Stroke is the leading cause of permanent disability and second common cause of death world wide³. The stroke is a sudden loss of functions of brain, it may be ischemic or hemorrhagic⁴. In stroke the functions of brain are lost in the affected area because of that, there is partial/complete disability in one/more limbs with or without speech or visual disturbances. The ischemic strokes are caused by the vascular interruption in the brain, while hemorrhagic stroke are due to rupture of a blood vessel or an abnormal vascular structure⁵. Majority of cases comes in the category of ischemic stroke⁶. Diabetes mellitus is a frequent comorbidity and a major risk factor for stroke.

The diabetic patients had 1.5 to 3 times increased risk of developing stroke in comparison to other population^{7,8,9}. World Health Organization has estimated that there is 170% increase (from 84 to 228 million) in the cases of diabetes in developing countries that is the 75% diabetic population of the world¹⁰. It was estimated in 2008 that Pakistan is harboring a burden of over 5 million diabetic patients that will be increased to 14.5 million by the year 2025¹¹. The prevalence of diabetes in Pakistan is 11.77%, which is 11.20% in males and 9.19% in females. The prevalence of diabetes in urban areas of Pakistan is 14.81% and 10.34% in rural areas¹².

More than 415 million diabetic are there worldwide poses an increased risk of cardiovascular abnormalities including stroke, other comorbid conditions of stroke like hypertension, dyslipidemia, and obesity also has a greater prevalence in diabetes, which further increases the risk of stroke in these patients¹³. The increase in the prevalence of diabetes each year making it an independent risk factor for stroke as with increasing age the prevalence of diabetes increases leading to an increase risk of stroke¹⁴. Diabetes has an increased susceptibility to develop atherosclerosis and producing a major role in the vascular pathology that results in ischemic stroke¹⁵. The mortality is also reported high in cases of strokes with diabetes, as the stroke is more prevalent in diabetics especially in women¹⁶.

¹. Department of Pathology / Medicine² / Community Medicine³, Peoples University of Medical and Health Sciences, Nawabshah.

Correspondence: Dr. Shamsuddin Shaikh, Professor of Medicine and Pro-Vice Chancellor, Peoples University of Medical and Health Sciences, Nawabshah.

Contact No: 03003205588

Email: qaisernaqvipk@yahoo.com

The current study was conducted to determine the frequency of stroke and its types in diabetic and non-diabetic patients of rural Sindh.

MATERIALS AND METHODS

This descriptive observational study was conducted on 74 cases of stroke during January 2016 to December 2016. The patients were collected from medical ward and out patient's department of Peoples Medical College Hospital as well as private clinic. All patients of acute stroke of any gender confirmed by CT scan (computed tomography) / MRI (magnetic resonance Imaging) of brain, aged between 40-70 years were included in the study. Patients with secondary stroke, history of head trauma, having space occupying lesion, patients receiving anticoagulant or steroid therapy, and patients having co-morbidity like hyper coagulative disorders, venous thrombosis, vasculitis etc, were excluded from the study. All the base line investigations were performed and blood sugar level

was assessed also with HbA1C level for diagnosis of Diabetes. CT scan or/and MRI of brain was performed in all cases for confirmation of types of stroke whether ischemic or hemorrhagic. The clinical and demographic data obtained was collected on a proforma and results were tabulated.

RESULTS

In this study we evaluate 74 cases of stroke including 48 (64.9%) males. Diabetes was diagnosed in 43 (58.1%) cases. Among these 53 (71.6%) cases having ischemic stroke and 21 (28.4%) having hemorrhagic stroke (table-1). Majority of diabetic patients were male and having ischemic stroke (table-2). 06 (8.1%) non-diabetic cases died majority of them were male with ischemic stroke, and 14 (18.9%) diabetic cases died among them majority were male having hemorrhagic stroke (table-3). As a whole 54 cases survive and the survival rate was more in male patients of ischemic stroke (table-4).

Table No.1: Number and Age of Diabetic and Non-Diabetic cases of stroke (n=74)

Study Population	No. of cases (%)	Age	Diabetic	Non-Diabetic	Ischemic Stroke	Hemorrhagic Stroke
Male	48 (64.9)	53.46±9.76	26(54.2)	22 (45.8)	32 (66.7)	16 (33.3)
Female	26 (35.1)	48.72±11.73	17(65.4)	09 (34.6)	21 (80.8)	05 (19.2)
Total	74 (100)	51.62±10.64	43(58.1)	31(41.9)	53 (71.6)	21 (28.4)

Table No.3: Distribution of Diabetic and Non-Diabetic Cases with Type of Stroke

Study Population	Diabetic Cases			Non-Diabetic Cases		
	Number of Cases	Ischemic Stroke	Hemorrhagic Stroke	Number of Cases	Ischemic Stroke	Hemorrhagic Stroke
Total	43 (100)	34(79.1)	09 (20.1)	31 (100)	19 (61.3)	12 (38.7)
Male	26 (60.5)	20 (77)	06 (23)	22 (71)	12 (54.5)	10 (45.5)
Female	17 (39.5)	14(82.4)	03 (17.6)	09 (29)	07 (77.8)	02 (22.2)
Survive	29	28	01	25	14	11
Death	14	06	08	06	05	01

Table No.3: Outcome in Terms of Mortality (n=74)

Diabetes Status	Total Number of Cases	Type of Stroke	No of Cases	Male	Female
Diabetic	14 (18.9%)	Ischemic	06	02	04
		Hemorrhagic	08	06	02
Non-Diabetic	06 (8.1%)	Ischemic	05	04	01
		Hemorrhagic	01	00	01
Total	20 (27%)		20	12	08

Table No.4: Outcome in Terms of Survival (n=74)

Diabetes Status	Total Number of Cases	Type of Stroke	No of Cases	Male	Female
Diabetic	29 (39.2%)	Ischemic	28	18	10
		Hemorrhagic	01	00	01
Non-Diabetic	25 (33.8%)	Ischemic	14	08	06
		Hemorrhagic	11	10	01
Total	54 (73%)		54	36	18

DISCUSSION

Prevalence of Diabetes Mellitus is increasing so are its complications mainly vascular thus cerebrovascular

accidents. We found 58% diabetic cases, most of the patients were not aware of their illness about diabetes, and were diagnosed during investigations, similar results were also observed by other researchers in

which majority (>50%) of stroke cases were having diabetes¹⁷. We noticed that diabetes was more prevalent in female patients in which 17 (65.4%) cases were diabetic as compare to males in which diabetes was diagnosed in 26 (54.3%) cases, these results confirms the values of other studies who found that diabetes is more common in female patients of stroke, as the diabetes increases the risk of stroke due to increased atherogenic risk within intra and extracranial arteries and due to tendency of hyperglycemia^{18,19}.

Majority of cases (71.6%) in current study were diagnosed as ischemic stroke, this finding was in consistent with other national and international data^{20,21}, from these cases of ischemic stroke majority (64.2%) of cases were proven diabetic, confirming the results of other studies who detect that the ischemic strokes are more frequent in diabetic patients^{14,16}.

In our study the outcome of stroke in terms of mortality in study population was 27%, the reported range of stroke mortality is 11-30%^{17,22-24}. We observed 18.9% death in diabetic patients with stroke as compare to 8.1% death in non-diabetic cases, this correlates with other studies²⁵ confirming that diabetes has negative impact on stroke outcome.

CONCLUSION

The ischemic strokes are more prevalent than hemorrhagic strokes especially in diabetic patients. The mortality rate was worse in cases of diabetes especially in hemorrhagic strokes. There is a need of early diagnosis and treatment of diabetes to avoid stroke and to improve prognosis in stroke.

Author's Contribution:

Concept & Design of Study:	Shamsuddin Shaikh
Drafting:	Syed Qaiser Husain Naqvi
Data Analysis:	Jawaid Hussain Lighari
Revisiting Critically:	Shamsuddin Shaikh, Syed Qaiser Husain Naqvi
Final Approval of version:	Shamsuddin Shaikh

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

- Krishnamurthi RV, Feigin VL, Forouzanfar MH, Mensah GA, Connor M, Bennett DA, et al. Global and regional burden of first-ever ischaemic and haemorrhagic stroke during 1990-2010: findings from the Global Burden of Disease Study 2010. *Lancet Glob Health* 2013;1:e259-e281.
- Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, et al. Heart Disease and Stroke Statistics-2016 Update: A Report From the American Heart Association. *Circulation* 2016;133:e38-360.
- Sander D, Sander K, Poppert H. Stroke in type 2 diabetes. *Br J Diabetes Vasc Dis* 2008;6:222-29.
- Sims NR, Muyderman H. Mitochondria, oxidative metabolism and cell death in stroke. *Biochim et Biophys Acta* 2009;1802(1):80-91.
- Donnan GA, Fisher M, Macleod M, Davis SM. Stroke. *Lancet* 2008;371(9624):1612-23.
- Sommer CJ. Ischemic stroke: experimental models and reality. *Acta Neuropathologica* 2017;133(2):245-61.
- American Diabetes Association. Standards of Medical Care in Diabetes-2015 Abridged for Primary Care Providers. *Clin Diabetes* 2015;33(2):97-111.
- American Diabetes Association. Standards of Medical Care in Diabetes-2014. *Diabetes Care* 2014;37(Supplement 1):S14-S80.
- Tun NN, Arunagirinathan G, Munshi SK, Pappachan JM. Diabetes mellitus and stroke: A clinical update. *World J Diabetes* 2017;8(6):235-48.
- Colosia AD, Palencia R, Khan S. Prevalence of hypertension and obesity in patients with type 2 diabetes mellitus in observational studies: a systematic literature review. *Diabetes, Metab Syndr Obes* 2013;6:327-38.
- Akhtar S, Khan Z, Rafiq M, Khan A. Prevalence of Type II diabetes in District Dir Lower in Pakistan. *Pak J Med Sci* 2016;32(3):622-5.
- Meo SA, Zia I, Bukhari IA, Shoukat AA. Type 2 diabetes mellitus in Pakistan: Current prevalence and future forecast. *J Pak Med Assoc* 2016;66(12):1637-1642.
- Dutton GR, Lewis CE. The Look AHEAD Trial: Implications for Lifestyle Intervention in Type 2 Diabetes Mellitus. *Prog Cardiovasc Dis* 2015;58:69-75.
- Chen R, Ovbiagele B, Feng W. Diabetes and Stroke: Epidemiology, Pathophysiology, Pharmaceuticals and Outcomes. *Am J Med Sci* 2016;351(4):380-6.
- Rask-Madsen C, King GL. Vascular complications of diabetes: mechanisms of injury and protective factors. *Cell Metab* 2013;17(1):20-33.
- Muñoz-Rivas N, Méndez-Bailón M, Hernández-Barrera V, de Miguel-Yanes J M, Jiménez-García R, Esteban-Hernández J, et al. Time Trends in Ischemic Stroke among Type 2 Diabetic and Non-Diabetic Patients: Analysis of the Spanish National Hospital Discharge Data (2003-2012). *Karamichos D, ed. PLoS ONE* 2015;10(12):e0145535.
- Qureshi MA, Jamshaid TD, Siddiqui AM. Stroke - a study of clinical patterns and risk factors. *Ann King Edward Med Coll* 2003;9:98-100.

18. Béjot Y, Giroud M. Stroke in diabetic patients. *Diabetes Metab* 2010;36Suppl 3:S84-7.
19. Kissela BM, Khoury J, Kleindorfer D, Woo D, Schneider A, Alwell K, et al. Epidemiology of ischemic stroke in patients with diabetes: the greater Cincinnati/Northern Kentucky Stroke Study. *Diabetes Care* 2005;28(2):355-9.
20. Ojaghihaghighi S, Vahdati SS, Mikaeilpour A, Ramouz A. Comparison of neurological clinical manifestation in patients with hemorrhagic and ischemic stroke. *World J Emerg Med* 2017;8(1):34-38.
21. Hsieh FI, Chiou HY. Stroke: Morbidity, Risk Factors, and Care in Taiwan. *J Stroke*. 2014;16(2): 59-64.
22. Vohra EA, Ahmed WU, Ali M. Aetiology and prognostic factors of patients admitted for stroke. *J Pak Med Assoc* 2000; 50: 234-36.
23. Alam I, Haider I, Wahab F, Khan W, Taqweem MA, Nowsherwan. Risk factors stratification in 100 patients of acute Stroke. *J Postgrad Med Inst* 2004;18:583-91.
24. Ahmed R, Shakir AH, Moizuddin SS, Haleem A, Ali S, Durani K, et al. Predictors of in hospital mortality for intracerebral hemorrhage: A hospital based study in Pakistani adults. *J Stroke Cerebrovasc Dis* 2001;10:122-27.
25. Yeap BB, McCaul KA, Flicker L, Hankey GJ, Almeida OP, Golledge J, et al. Diabetes, myocardial infarction and stroke are distinct and duration - dependent predictors of subsequent cardiovascular events and all-cause mortality in older men. *J Clin Endocrinol Metab* 2015; 100(3):1038-47.

Disastrous Effects of Fracture Treatment by Traditional Bone Setters

Zahoor Illahi Soomro¹, Allah Nawaz Abbasi¹, Karam Ali Shah² and Kishore
Kumar Khatri²

ABSTRACT

Objective: The objective of this study is to evaluate the complications seen in patients previously treated by traditional bone setters (TBS).

Study Design: Prospective descriptive study

Place and Duration of Study: This study was conducted at the Department of Orthopedic Surgery Peoples University of Medical & Health Sciences, Nawabshah from January 2017 to December 2017.

Materials and Methods: Total number of 50 cases of either sex initially treated by traditional bone setters reported at this hospital in emergency and OPD were included in this study. All the data was collected on a performa designed for the study.

Results: Total number of 50 patients were included in this study only 6(12%) patients got good results in the form of fracture union in satisfactory position and functional range of movements of involved joints, while remaining 44(88%) patients were suffering from complications. 15(30%) of patients out of 44 patients had mal-union, 7(14%) of patients had non-union, 4(8%) developed gangrene, 6(12%) patients reported compartment syndrome, 4(8%) patients had cellulitis, 3(6%) patients had infection, 2(4%) patients developed Volkmann's ischemic contracture and remaining number of patients developed stiffness of different joints.

Conclusion: To avoid such complications of traditional bone setters, it is important that their patronization should be discouraged.

Key Words: Traditional bonesetters, fracture, complications.

Citation of articles: Soomro ZI, Abbasi AN, Shah KA, Khatri KK. Disastrous Effects of Fracture Treatment by Traditional Bone Setters. Med Forum 2018;29(9):58-61.

INTRODUCTION

Orthopedic surgeons deal with deformity, diseases of bones and joints, and injuries to the musculoskeletal system. Because these are among the commonest things to affect humankind, there must always have been orthopedic surgeons of one kind or another, even in the most primitive communities. Wherever there was a witch doctor or medicine man dealing with illness and disease, as general practitioners and physicians do now, somewhere there would have been a bonesetter treating fractures and straightening limbs.

In some countries, the work of the bonesetter was willingly carried out by physicians, and Hippocrates himself is credited with the development of a technique for reducing dislocated shoulders which stood the test of time until general anesthesia made it easy to overcome muscle spasm.¹

¹. Department of Orthopaedic Surgery, PUMHS, Nawabshah.

². Department of Orthopaedic Surgery, PUMHSW, Nawabshah.

Correspondence: Zahoor Illahi Soomro, Assistant Professor of Orthopaedic Surgery, PUMHS, Nawabshah.

Contact No: 0301-3814247

Email: zisoomro786@yahoo.com

Received: March, 2018;

Accepted: July, 2018

Physicians were not always as enlightened as Hippocrates. The bonesetter, who earned his living by his ability to manipulate broken limbs, was often regarded with disfavor by the established medical profession, and this was certainly true in Britain. When the medical act of 1858 restricted the use of the title Doctor to those who had passed certain recognized examinations, bonesetter were excluded and become unregistered practitioners; whoever, this did not stop them practicing, and their success remained a source of continual irritation to the medical profession.²

The medical profession might have been denied access to the 'black arts' of the bonesetter altogether if it had not been for Even Thomas, renowned as the last of the great Welsh bonesetter, who decided to put all five of his sons through medical school. One of these sons was the legendary Hugh Owen Thomas (1834-91), who trained in Edinburgh but qualified with the London MRCS in 1857. It is ironic that when Hugh Owen Thomas joined his father's practice in Liverpool, they found themselves unable to work together and quickly parted.³

As orthopedic surgery became established, it attracted much the same attention from factions within the medical profession as the profession had shown the bonesetters of the nineteenth century. In 1918, 12 surgeons founded the British Orthopedics Association. Also in 1918, the Royal College of Surgeons in England

found time in a busy schedule to view with mistrust and disapprobation the movement in progress to remove the treatment of conditions, always properly regarded as the main portion of the General Surgeons work, from his hands and places it in those of orthopedic specialist. The general surgeons were right to be worried; they are now almost outnumbered by orthopedic surgeons and the gap is closing fast.⁴

In many parts of developing world, large proportion of fracture continue to be treated by Traditional Bone Setters (TBS) who are readily available and often have a good local reputation.^{1,2} TBS's service is an old practice of joint manipulation and treating fractures dates back to ancient times and roots in most countries of the world.^{3,4} Modern orthopedic surgery has changed the treatment protocol and made traditional bonesetter (TBS) Services forbid in developed countries. Traditional Bone Setter (TBS) have been operating in rural and urban areas of Pakistan for centuries and most of the rural population prefer setting treating their fractures from a bonesetter to going to a hospital. In our setup, traditional bonesetters are widely popular and often the only address for treatment of bone related injuries. Traditional bonesetter are also know to offer cheaper services and allegedly faster treatment options. Traditional bonesetter usually claimed that the some fracture which doctors charge thousands of rupees and conduct operations to set, they can set which via decades old technique^{5,6}. The most common methods of treatment by traditional bonesetter is to immobilize the fractured limb by application of tight splints and bandages. Majority of traditional bonesetters were trained by transferred knowledge from father to son and they usually use the easily available materials for fractured limb immobilization in the form of mud, bamboo sticks, rough wooden sticks, wooden bars, animal hairs or other contaminated herbs.⁷⁻¹⁰ The Traditional Bonesetters (TBS) treat their patients without reading the x-rays, even they don't know the basic anatomy and physiology of limbs, therefore they don't care about prevention and control of infection, which will be usually resulted into limb and life threatening complications.^{7,11,12}

Most commonly reported complications include limb deformities due to mal-union & non-union, acute compartment syndrome, Volkmann's ischemic contracture, tetanus, osteomyelitis, gangrene, amputation and death.^{3,8,10,13,14} The purpose of this study is to share our experience on the pattern of complications of treatment of musculoskeletal injuries by traditional bone setters at public sector hospital.

MATERIALS AND METHODS

This descriptive study was conducted at the Department of Orthopedic Surgery, Peoples University of Medical and Health Sciences, Nawabshah from January 2017 to December 2017. Total numbers of 50 cases of either

sex initially treated by the traditional bonesetters reported at this hospital in emergency and out patients department were included in this study. All the information about the patients bio-data, injury pattern and extremity involved and complications were obtained by a predesigned proforma.

RESULTS

Out of 50 cases there were 34 (68%) males and 16(32%) females. The male:female ratio was 3:1 (Fig.No.1).

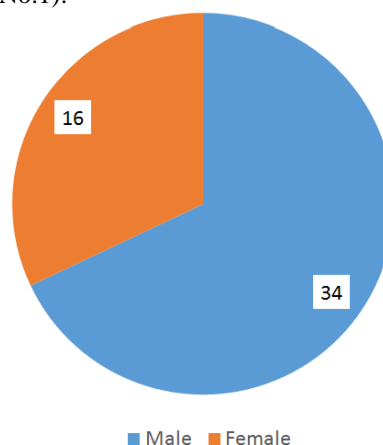


Figure No.1: Sex Distribution of patients

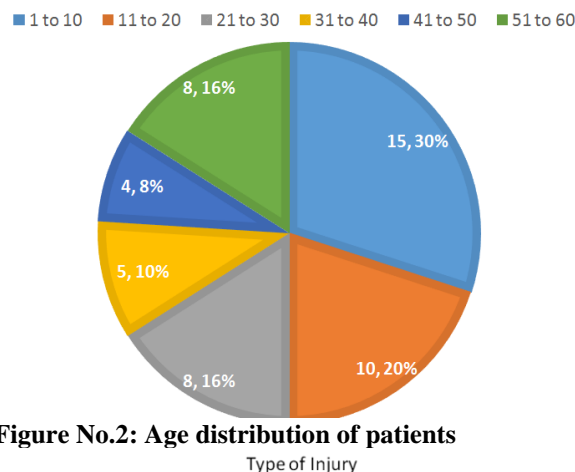


Figure No.2: Age distribution of patients

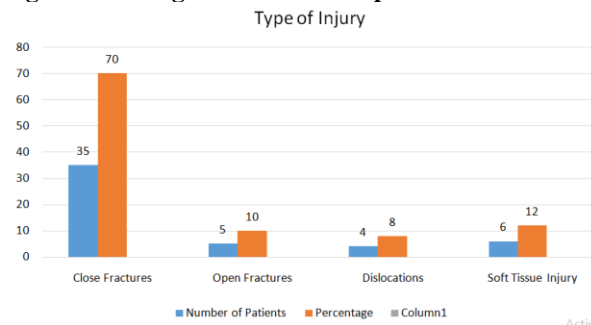


Figure No.3: Inquiry pattern

The minimum age of the patient was one year and the maximum age of the patient was 60 years. The common age group of the patients was first and second decade in this study. (Fig.No.2).

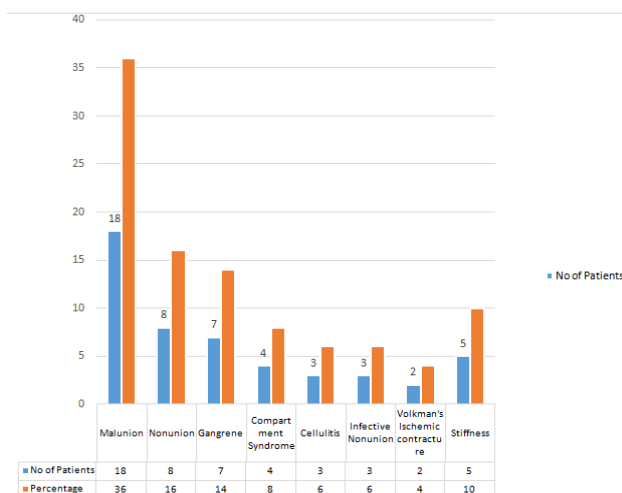


Figure No.4: Complications

Table No.1: Extremity involved (n=50)

Extremity involved	Number of patients	%age of patients
Upper limb bones & joints		
Diaphyseal fracture of humerus	05	10%
Supracondylar Fracture of humerus	10	20%
Fracture of Radius/Ulna Shafts	10	20%
Dislocation of Elbow Joint	02	4%
Fracture of Lateral condyle of humerus	01	2%
Fracture of Clavicle	02	4%
Lower limb bones & joints		
Diaphyseal fractures of Femur	08	16%
Diaphyseal fracture of Tibia	10	20%
Fracture and dislocation around Ankle joint	02	4%

Among 50 patients there were 35 close fractures, 5 open fractures, 4 dislocations and 6 were soft tissues injuries. (Fig.No.3)

Most of the patients had long bone fractures. In upper limb most frequently fractured bones were humerus and radius & ulna. Shaft of humerus fracture in 5 patients, radius & ulna shaft fracture in 10 patients, elbow dislocation in 2 patients, supracondylar humerus fracture in 10 patients, clavicle fracture in 2 patients and lateral condyle fracture of humerus in 1 patient. In lower limb femur fracture in 8 patients, tibia fracture in 10 patients and ankle fractures in 2 patients were recorded (Table 1).

The traditional bone setters treated their patients for varying period of time ranging from 3 days to 9 months, but average duration of treatment in this study was 3 months.

Complications including mal-union in 18 patients, non-union in 8 patients, gangrene in 7 patients, compartment syndrome in 4 patients, cellulitis in 3 patients, osteomyelitis in 3 patients, contracture in 2 patients and stiffness of joints in 5 patients. (Fig.No.4).

DISCUSSION

The goal of musculoskeletal injuries management by orthopedic surgeons is good anatomic approximation, satisfactory union of fracture and to achieve functional range of motion of injured limbs as close as possible to normal. In our setup traditional bone setting is well recognized and age long practice, they treat musculoskeletal injuries inadequately which results into various complications. This study has been compared with other studies regarding gender, age of the patients, injury pattern, extremity involved and complications. The results obtained in this study are comparable to those mentioned in the local and interventional literature.^{4,6-8,10,15-17}

Our study showed that 68% of the male patients were managed by Traditional Bonesetter, while study by Imran K et al showed 73.3% of male patients.⁸ The frequency of various Traditional Bonesetter complications had been found in our study. There were 36% of patients developed mal-union, 16% of patients developed non-union, 7% of patients developed gangrene, 6% of patients suffered from osteomyelitis, 4% of patients developed contracture and 10% of patients developed joint stiffness. In study done by Imran K et al revealed 51.7% of patients with mal-union, 31.7% of patients with non-union, 6.7% of patients with contracture and 6.7% of patients with gangrene needing amputation and 3.3% of patients with infections.⁸ In 2001, Ola Olorun DA studied 36 patients that had been treated by Traditional Bonesetter. In his study complication rate was 83% and the most common were mal-union and non-union.¹⁸ Another study done by FaheemAM et al on the complications of Traditional Bonesetter in which he observed 43% of patients with mal-union and non-union.¹⁵

Another study conducted by Aniekan UE et al stated in his study, the most frequent complications were non-union (36.47%) and mal-union (24.71%) and both were associated with shortening in 31.76%.¹⁹

Loa Thani stated in his study of 43% of patients developed mal-union, 15% of patients developed non-union, 17% of patients developed gangrene and 15% of patients developed stiffness.⁶ Study done by Khan I et al showed 38% of patients with Mal-union, 26% of patients with non-union, 20% of patients with gangrene and 7% of patients with joint stiffness.¹⁰

Frequencies of complications are almost same in our series as compared with other studies.

CONCLUSION

From the above discussion, it is clear that the practice of traditional bone setters is a major source of orthopedic complications with resulting morbidities and same time mortalities. Awareness programs should be arranged in which people has to be informed about treatment deficiencies and complications of traditional bone setters. To avoid such complications, it is important that their patronization should be discouraged.

Author's Contribution:

Concept & Design of Study: Zahoor Illahi Soomro
 Drafting: Allah Nawaz Abbasi
 Data Analysis: Karam Ali Shah, Kishore Kumar Khatri
 Revisiting Critically: Zahoor Illahi Soomro, Allah Nawaz Abbasi
 Final Approval of version: Zahoor Illahi Soomro

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Omagbemi DO, Adiki TO, Elachi CI, Bafor A. Complications of traditional bone setter (TBS) treatment of musculoskeletal injuries: experience in a private setting in Warri, South Nigeria. *The Pan Afri Med J* 2018;30:189.
2. Agarwal A, Agarwal R. the practice and tradition of bonesetting. *Education for Health* 2010;23(1): 1-8.
3. Dada AA, Yinusa W, Giwa SO. Review of Practice of Traditional Bone Setting in Nigeria. *Afr Health Sci* 2011;11(2):262-65.
4. Panigrahi TK, Mishra DN, Padhy N. Fracture management by Traditional Bonesetter: A hospital based observational study. *JMSCR* 2017; 5(10): 29177-182.
5. Aries MJH, Joosten H, Wegdam HHJ, Vander Geest S. Fractures treatment by bonesetters in central Ghana: Patients explain their choices and experiences. *Top Med Int Health* 2007;12(4): 564-74.
6. Thanni LOA. Factors influencing patronage of traditional bone setters. *West Afr J Med* 2000; 19(3):220.24.
7. Onyemaechi NO, Lasebikan OA, Elachi IC, Popoola SO, Oluwadiya KS. Patronage of traditional bone setters in Makurdi, north-central Nigeria. *Patient prefer Adherence* 2015;9:275-9.
8. Khan I, Inam M, Saeed M, Afridi F, Arif M, Hakim A, et al. Complications of Fracture Treatment by Traditional Bonesetters. *J Pakistan Orthopaedic Association* 2016; 28(1):12-16.
9. Ogunlusi JD, Okem IC, Oginni LM. Why patients patronize traditional bonesetters. *Internal J Orthop Surg* 2007; 4(2):1-7.
10. Khan I, Saeed M, Inam M, Arif M. Traditional bonesetters; preference and patronage. *Profess Med J* 2015; 22(9):1181-85.
11. Mathieu L, Bertani A, Chandier P, Charpail C, Rongieras F, Chauvin F. Management of the complications of traditional bone setting for upper extremity fractures: The experiences of a French Forward Surgical Team in Chad. *Chirurgie de la Main* 2014; 33 (2):137-43.
12. Alam W, Shah FA, Ahmed A, Ahmed S, Shah A. Traditional bonesetters; Frequency of complications with treatment by traditional bonesetter. *Professional Med J* 2016; 23(6): 699.704.
13. Odatuwa-Omagbemi DO. Complications of traditional bonesetters practice in Nigeria. The need for urgent action. *Nig Research Clin Sci* 2012;2(1):1.5.
14. Kuubiere BC, Abbas A, Mustapha I. Fracture complications after treatment by traditional bonesetters in Northern Ghana. *Adv Appl Sci Res* 2013; 4(6):207-11.
15. Faheem AM, Saeed G, Fazal B, Bhutto I, Laghari MA, Siddiqui KA, et al. Complications of fracture treatment by traditional bonesetter at Hyderabad. *J Pak Orthopaedic Assoc* 2009;21(2):58-64.
16. Odatuwa-Omagbemi DO, Inikori AK, Otene CI, Enemudo RET. Musculoskeletal injuries: a cross-sectional study in a sub-urban teaching hospital. *Nig J Ortho P Trauma* 2013; 12(10):66.70.
17. Mubashir A, Tahir MT, Syed AA, Waseem AM, Nasir AMB. Non-Fatal limb injuries in motorcycle accidents. *J Coll Phys Surg Pak* 2008;18(10): 635:38.
18. Ola Olorum DA, Oladiran IA and Adeniran A. Complication of fracture treatment by Traditional bonesetters in southwest Nigeria. *Family practice* 2001;18:635-37.
19. Ekere AU, Echem RC. Complications of fracture in dislocation treatment by traditional bone setters: A private practice experience. *The Nigerian Health J* 2011; 11(4):131-38.

Efficacy of Trans-Abdominal & Trans-Vaginal Repair in the Management of Vesico-Vaginal Fistula

Efficacy of Trans-Abdominal & Trans-Vaginal Repair in VVF

Qamar Raza Brohi¹, Muhammad Ali Suhail² and Habib ur Rehman Khan Toor¹

ABSTRACT

Objective: To determine the success rate of transabdominal and transvaginal surgical repair of vesico-vaginal fistulae(VVF).

Study Design: Descriptive study

Place and Duration of Study: This study was conducted at the Departments of Urology & surgery at Peoples University of Medical and Health Sciences Hospital Nawabshah from December 2013 to May 2016.

Materials and Methods: Patients were selected on exclusion and inclusion criteria. Cases of Vesico-vaginal Fistulae (VVF) were included after a detailed history, clinical examination and investigations. Examination under anesthesia and cystoscopy were performed. Cases with genitor urinary pelvic malignancies, uretero vaginal fistulae, urethro vaginal fistulae, ocomplex fistulae involving intestine were excluded. Two groups A & B were made on the basis of approach of repair. In group A vaginal approach was opted to repair uncomplicated low fistulae. In group-B abdominal approach was opted to repair high vesico vaginal fistulae . Results were noted postoperatively and data was analyzed.

Results: This 30 months study included 52 female patients, 30 cases in group A and 22 cases group B. . Mean age was 37 years SD± 5 and a range of 22 to 53 in group A while in group B mean age was 34.6 years SD± 4.I and a range of 23 to 55. Mean post operative hospital stay was 6 days in group A while it was 10 in group B. Failure in terms post operative persistent urinary leakage was detected in 4(12 %) in group A while it was observed in 3(13%) cases in group B. consequently success rate of vaginal approach was 88% and that of abdominal approach was 87%.

Conclusion: Both vaginal and abdominal approaches to repair low and high vesico vaginal fistula respectively, are almost equally successful at a rate of 88% and 87% respectively.

Key Words: Birth trauma, Vesicovaginal Fistula, Transabdominal repair, Transvaginal repair

Citation of articles: Brohi QR, Suhail MA, Toor HRK. Efficacy of Trans-Abdominal & Trans-Vaginal Repair in the Management of Vesico-Vaginal Fistula. Med Forum 2018;29(9):62-64.

INTRODUCTION

The historical background of vesico vaginal fistulas (VVF) dates back 2000 BC as evidences of VVF found in Egyptian mummies^{1,2}. Birth trauma can lead to one of the most devastating complications, the Vesico-vaginal fistula (VVF)³. VVF is an abnormal granulated track communicating between epithelial surfaces of urinary bladder and vagina resulting in incontinence of urine⁴. In contrary to advanced countries, developing countries are still facing higher rates of VVF where a suboptimal management of prolonged obstructed labor is considered as a main etiological factor.^{5,6} Obstructed labour can promote pressure necrosis, tissue sloughing, cicatrization and resulting in vesico-vaginal fistula formation⁷. In developed countries non obstetric factors like genitourinary malignancies and pelvic surgeries

play a major role in causing VVF reflecting a better and improved pre-natal and natal obstetrics care^{8,9}. The duration between the formation of VVF and its clinical presentation is variable and depends upon the etiological factors as it presents early in non obstetric surgical injuries while it takes about 7-30 days to present in obstetric injuries.¹⁰ Diagnosis of VVF is clinical and suspected in patients with urine smelling vaginal discharging and history of recent obstructed labour or pelvic surgeries^{11,12}. Alternate conditions like haematuria , cystitis, pyelonephritis can also raise the suspicious fear of VVF.¹³Symptomatic clinical differences between vesico vaginal and uretero vaginal fistula can be established, in former condition there is no normal voiding because of constant uncontrolled leakage of urine from vagina while in later case there is simultaneous normal voiding and uncontrolled leakage of urine per vagina^{14,15}. VVF greatly distorts the quality of life and the affected patients always in search of a good permanent cure. For the management of this problem the ideal time of surgical intervention, route of approach and techniques some time poses matter of debate between the surgeons¹⁶⁻¹⁷. To repair VVF two common approaches, abdominal and vaginal, have got world wide acceptance but with variable results.

¹. Department of Surgery / Urology², PUMHS Nawabshah.

Correspondence: Qamar Raza Brohi, Assistant Professor of Surgery, PUMHS Nawabshah.

Contact No: 0300-3210546

Email: drqamarrazabrhi@yahoo.com

Received: February, 2018;

Accepted: May, 2018

Abdominal approach is generally considered as a good option for high level while vaginal approach is for low level VVF.

MATERIALS AND METHODS

These 30 months was conducted at Peoples University of Medical and Health Sciences Nawabshah in departments of urology and surgery from December 2013 to May 2016. Cases were selected on the basis of detailed history, clinical examination including pervaginal examination and cystoscopy under anaesthesia. Exclusion of cases was followed for the patients having complex fistulae, urethro vaginal fistulae, urethro vaginal, entero vaginal fistulae and fistula with associated malignancy. All cases under went routine workup comprising basic blood investigations, blood chemistry, ultrasound and contrast enhanced pelvic CT scans. Two groups of Cases were made on the basis of level of VVF and method of repair. Group A comprised In group A vaginal approach was opted to repair uncomplicated low fistulae. In group-B abdominal approach was opted to repair high vesico vaginal fistulae. Spinal anesthesia was used for both approaches. Patients for abdominal approach were positioned supine and patients for vaginal approaches were placed in lithotomy positioned on the operating table. Both procedures were preceded with preliminary cystoscopic examinations to confirm site of the fistulous opening in the urinary bladder and to secure the ureters with ureteric catheters. In group A a negotiable foley's catheter is introduced through the vaginal opening into the bladder for tenting the fistulous tract to facilitate the dissection. All surrounding fibrous tissues along with the tract was excised. The vagina and urinary bladder isolated from the tract and meticulously repaired in separate layers. In group B lower mid line incisions were given and bladder was entered. Vesical fistulous opening was searched and a negotiable foley's catheter is introduced through the vesical opening into the vagina for tenting the fistulous tract to facilitate the dissection. Whole fibrous along with fistulous tract was excised, bladder and vaginal walls were separated from each other and repaired separately using 2/0 vicryl with inter positioning of omentum.

Postoperatively the urinary bladder was kept decompressed with urinary catheters for 1 week, broad spectrum antibiotics were administered. Patients was discharged from hospitals after 6 to 11 days. Weekly follow up visits were scheduled up to 6 weeks and then as per needed.

RESULTS

This study was conducted for 30 months and included 52 cases of vesico vaginal fistulae. Group A comprises 30 cases while in Group B 22 cases were included. Mean age was 37 years $SD \pm 5$ and a range of 22 to 53

in group A while in group B mean age was 34.6 years $SD \pm 4.1$ and a range of 23 to 55. In group A post op pain was mild in 21 cases and remaining cases had no pain. In group B 4 cases experienced severe post op pain, 7 cases had moderate pain while remaining 11 cases had mild post operative wound pain. Mean post operative hospital stay was 6 days in group A while it was 10 in group B. Post operative vaginal surgical site infection was not occurred in any case in group A. In group B post operative abdominal surgical site infection was found in 3 cases, two of them were of grade iii and one grade iv according to Southampton wound grading system. Haematuria was noted post operatively in 4 cases of group A and 2 cases of group B but this haematuria was temporary and of short duration lasting not more than three days. Temporary urinary leakage was recorded in 7 cases post operatively in group A and it was found 5 cases of group B. Persistent post operative urinary leakage is considered as failure of the procedure and was found in 4 cases of group A and 3 cases of group B.

DISCUSSION

Even today, the era of modernized globalization, vesico vaginal fistula is one of the most devastating surgical complications in the field of gynecology and obstetrics. Although its frequency has been decreased in the developed countries but it is still prevailing with significant frequency in developing countries mainly because of poorly managed prolonged obstructed labor^{19,20}. Apart from the morbidity resulted from VVF there is an associated profound social embarrassment²¹. In the current study mean age of the cases was 37 years in group A while in group B mean age was 34 years that is parallel with Wadie & Kamal²². Post operative pain was comparatively minimal in group A with vaginal approach as there is no external wound on the skin and subcutaneous tissues. Similarly there was no any surgical site infection in vaginal approach while it occurred in 3(13%) again reflecting the role of skin & sub-cutaneous wounds. Urinary leakage from the VVF is the key factor rendering the patients physically morbid and socially embarrassed to seek definitive cure. As the aim of a management plan of any surgical challenge is to achieve a maximum success, likewise permanent cure of urinary leakage in VVF cases remains the goal and successful outcome of any selected approach. The current study observed post operative persistent urinary leakage in 4(12%) cases of group A and 3(13%)cases in group B, translating the success rate of vaginal approach 88% and that of abdominal approach 87%. Success rate in present study is within range of both national and international data and very similar to Javed et al(87%) but higher than Bassem's study^{22,23}.

CONCLUSION

Both vaginal and abdominal approaches to repair low and high vesico vaginal fistula respectively, are almost equally successful at a rate of 88% and 87% respectively.

Author's Contribution:

Concept & Design of Study: Qamar Raza Brohi
 Drafting: Muhammad Ali Suhail
 Data Analysis: Habib ur Rehman Khan Toor
 Revisiting Critically: Qamar Raza Brohi, Muhammad Ali Suhail
 Final Approval of version: Qamar Raza Brohi

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Vishwajeet S, Rahul S, Seema M, Sankhwar S, Sanjay B. Repair of vesicovaginal fistula by the transabdominal route: outcome at a north Indian tertiary hospital. *Int Urogynecol J* 2012;23(4):411.
2. Robinson D, Cardozo L. Urinary incontinence. In: Edmonds DK, editor. *Dewhurst's text book of obstetrics and gynaecology*. 7th ed. London: Blackwell;2009.p.504-59.
3. Zambon JP, Batezini NS, Pinto ER, Skaff M, Girotti ME, Almeida FG. Do we need new surgical techniques to repair vesico-vaginal fistulas? *Int Urogynecol J* 2010;21:337-42.
4. Role of Day Care Vesicovaginal Fistula Fulguration in Small Vesicovaginal Fistula. *J Endourol* 2010;24(10):1659.
5. Operación de Latzko en fistula vesicovaginal recidivante. Reporte de dos casos y revisión del tema. Meraz Ávila, Diego; Vilchis Nava, Pablo; Nevarez Bernal, Roberto Armando *Ginecología y Obstetricia de México* 2012;80(12): 788.
6. Sahito, Ahmed R, Ali SM, Farhana S. Per Abdominal Repair of Vesico-Vaginal Fistula Surgical Experience of 30 Cases. *Medical Channel* 2012;18(1):87.
7. Rajamaheswari N, Chhikara AB, Seethalakshmi K, Bail A, Agarwal S. Trans-vaginal repair of gynecological supratrigonal vesicovaginal fistulae: A worthy option! *Urol Ann* 2012;4:154-7.
8. Kumar A, Goyal NK, Das SK, Trivedi S, Dwivedi US, Singh PB. Our experience with genitourinary fistulae. *Urol Int* 2009;82:404-10.
9. Spurlock J. Vesicovaginal fistula [Internet]. [updated 2009 Oct1] Available from: <http://emedicine.medscape.com/article/267943-overview>.
10. Bureau of Statistics. Planning and Development Department government of the Punjab: multiple indicators cluster survey 2007-08. Lahore: Bureau of Statistics; 2009.
11. Rehman SA, Ahmad G, Hassan T, Ansari AS. Repair of Vesicovaginal Fistulae. *ANNALS*. 2011; 17(1):80-85.
12. Rajamaheswari N, Archana Bharti K. Seethalakshmi. Vaginal repair of supratrigonal vesicovaginal fistulae- a 10-year review. *Int Urogynecol J* 2012;23(12).p1675-8.
13. Shaikh AR, Shaikh S, Shaikh SN, Shaikh AH, Memon AA. Repair of vesico-vaginal fistula (Abdominal versus vaginal route). *Profess Med J* 2011;18(3): 354-60.
14. Islam M, Ahmed S. Transperitoneal approach with interposition of omentum for the repair of supratrigonal vesicovaginal fistulae. *J Med Sci (Peshawar, Print)* 2010;18(4):178-181.
15. Pushpa SS, Nabila H, Razia MA, Chandra MD. Genito-urinary fistula: a major morbidity in developing countries. *J Ayub Med Coll Abbottabad* 2009;21(2):8-11.
16. Zarin M, Khan M, Rehman M, Afridi MR, Aurangze. Transabdominal repair of Vesicovaginal Fistula: An experience of 27 cases. *Pak J Med Sci* 2010;26(3):581-4.
17. Uprety DK, Subedi S, Budhathoki B, Regmi MC. Vesicovaginal fistula at tertiary care center in eastern Nepal". *JNMA J Nepal Med Assoc* 2008; 47(171):120-2.
18. de Silva WAS. Vesico vaginal fistula. *Sri Lanka J Urol* 2010;11:1-6.
19. Inimgba MN, Okpani OAU, John CT. Vesico-vaginal fistula in Port-Harcourt, Nigeria. *Trop J Obstet Gynaecol* 1999;16:49-51.
20. Capes T, Ascher-Walsh C, Abdoulaye I, Brodman M. Obstetric fistula in low and middle income countries. *Mt Sinai J Med* 2011;78(3):352-61.
21. Kelly J. Out reached programmed for obstetric fistula. *J Obstet Gynaecol* 2004;24(2):117-118.
22. Wadie BS. Kamal MM. Repair of vesicovaginal fistula: Single-centre experience and analysis of outcome predictors. *Arab J Urol* 2011;9:135-8.
23. Javed A, Abdullah A, Faruqi N, et al. Doctor! Will I be dry? Factors determining recurrence after vesicovaginal fistula repair. *JPM* 2015;65(9): 954-8.

Study of UTI Causing Organisms in Patients Visiting Tertiary Care Hospitals

Muhammad Amjad, Muhammad Shafiq and Muhammad Safdar

ABSTRACT

Objective: To assess the frequency of UTI causing organisms and to determine the frequency in both the genders.

Study Design: Prospective / cross sectional study

Place and Duration of Study: This study was conducted at the tertiary care hospital from July 2015 to June 2016.

Materials and Methods: The patients presented at the urology department with complaints of urinary tract infection aging 21-70 years were enrolled with simple purposive sampling in the study. The majority of the patients got enrolled were aging 21-35 years. The data was collected with the help of preformed questionnaire.

Results: 340 patients were enrolled in the study 202 females and 138 males by purposive sampling. The urine sample was collected and sent to hospital laboratory for culture and examination. most of cases with positive culture with identified organisms had klebsiellapneumonia, Staphylococcus sp., Escherichia Coli, Pseudomonas, Proteus SP and Candida's.

Conclusion: It is concluded from the results of the study that E. coli is the most common organism causing UTI in both males and females.

Key Words: Urinary tract infections, isolated microorganisms, Patients.

Citation of articles: Amjad M, Shafiq M, Safdar M. Study of UTI Causing Organisms in Patients Visiting Tertiary Care Hospitals. Med Forum 2018;29(9):65-67.

INTRODUCTION

The Urinary tract infection is the condition having multiple clinical symptoms that are clinically positive ranging from asymptomatic bacteriuria that may lead to kidney infections¹. It is a serious health concern and is the 2nd most common disease of the body affecting the millions of the people and is a serious public health problem. According to an estimate, 150 million cases of urinary tract infections are diagnosed per annum². The urinary tract infections are the most common bacterial infections being presented to clinicians on routine basis in the developing countries. A patient can be affected by UTI in any time in his life, in all ages including childhood and old age in both genders³. The clinical symptoms of urinary tract infections include urinary pain or burning sensation while urinating, cola or vivid pink color and blood signs, more frequent as well as urgency to urinate. If the urinary bladder is filled with urine, the patient may sense pain in the pubic bone, infemale's pelvic pain and in male's rectal pain and smell of cloudiness, even after the disease is softened the bladder still reacts sensitively⁴. In infants and children, the clinical symptom of the urinary tract Infection can be fever, vomiting, more sleep, signs of

malnutrition, or jaundice. Newly manifesting urinary incontinence may occur in elderly children⁵. The normal microbial flora is the habitant of parts of the body or reside in it. Normally bacteria are also found in vagina and urethral area that rarely cause disease in healthy people. After the child is born, the peri-urethral area gets normal habitants of bacteria to counter the UTI pathogens. when the patient is given antibiotics for any other disease, the normal flora is destroyed and the risk of the UTI is increased. the lactobacillus species reside in the vagina and there are responsible for the specific odour of the vaginal are, they produce lactic acid and some produce hydrogen peroxide, during mensuration the normal vaginal flora is disturbed and hence the risks of UTI are increased⁶. Almost 95% of the cases of UTI are due to bacteria that normally is habitant of the opening of urethra and then migrate to bladder. Most of the infections are due to retrograde rise in the number of bacteria from the faecal plexus via urethra to the bladder and then to the kidney, and it is more seen in women due to shorter urethra. The prevalence of all the UTIs are increasing in origin and the cause is the flora off the gastrointestinal tract which occupies per urethral area⁷. The increased incidence of UTI is in females as compared to males, the reason may be due to trauma during sexual intercourse and chronic pathogens in the perennal skin and in males the pathogens are found in the capsule. In case of infants, the congenital anomalies are the main reasons for UTIs. the prevalence of females compared to males, the more severe pollution during sexual intercourse, urethral massage, and even chronic pathogens present in perennal skin. In males, the organisms are often come

Department of Urology Kidney Center BVH Bahawalpur.

Correspondence: Dr. Muhammad Amjad, Senior Registrar,
Department of Urology Kidney Center BVH Bahawalpur.
Contact No: 0334-7090802
Email: dramjad284@hotmail.com

Received: January, 2018;

Accepted: April, 2018

under the capsule. And in elderly, the obstruction due to prostate enlargement causes partial emptying of the bladder and increases the risk of the UTI⁸. It is really important to treat the disease as soon as possible to reduce the risks for long term morbidity and mortality.⁹ The proper treatment requires the understanding of etiology and the bacterial factors and role of host. proper diagnosis and management in most of the cases result in the success in resolution of the infection¹⁰.

MATERIALS AND METHODS

It is a cross sectional study done at a Urology Kidney Center BVH Bahawalpur. Duration of the study from July 2015 to June 2016. In the study, 340 cases were enrolled. Patients presenting at the Urology department with symptoms of urinary tract infections were enrolled in the study by the purposive sampling. Patient's urine was collected and sent for culture and examination. The Data was taken with the help of preformed questionnaire. the data analysis was done by spss20. Data management was done properly keeping the filled questionnaires and all other relevant documents in safe lockers and putting the data on daily in SPSS to analyze statistically.

RESULTS

All of the 340 patients having UTI and positive urine culture were enrolled in our study. There are 202 (64%) females having positive urine culture and 108 (36%) males having positive urine culture.

Table No.1: Percentage of microorganisms with sex distribution

Microorganism	Frequency (Percentage)	Sex	
		Female	Male
Klebsiellapneumonea	64.6 (19%)	26 (8.6%)	34 (10.3%)
Escherichia Coli	132 (39%)	78 (26%)	44 (13%)
Staphylococcus sp.	17 (5.7%)	10 (3.6%)	9 (3%)
Proteus sp.	15 (5%)	9 (3%)	6 (2%)
Candida	7 (2.3%)	2 (0.67%)	5 (1.6%)
Pseudomonas	99 (29%)	66 (22%)	24 (7%)

Cases enrolled in our study aged 21 to 70 years. And bacteria identified of urine culture are as: Klebsiellapneumonea, Escherichia Coli, Candida and Pseudomonas. Staphylococcus sp., Proteus sp percentage and frequency of bacteria is given in the table 1. The most highly prevalent of the microorganisms is E. coli and the least frequent is Candida. The most frequent of the pathogen among females was recorded to be of E. coli (26%) and same is highest among males (12%).

DISCUSSION

Urinary tract infections pose serious challenge for the community and hospitals. According to surveys conducted, UTIs are the commonest bacterial disease reported in emergency and OPD patients. The hundred thousand of hospitalizations per annum are due to UTIs, 1.1 million emergency patients and 7 million OPD patients, causing a huge financial burden, as per an estimate 1.6 billion are being paid per year due to UTI.¹¹ There is variability in the results of prevalence of UTI depending on the age and sex of the cases¹². Urinary tract infections are More common among females than in males, 33% of the females are affected by UTI in life time for at least once¹³.

In this study, the highly prevalent age for this disease is 21-35 years of age. and more female patients than males. 340 patients were enrolled in our study and 202 were females and 138 were males. The prevalence is near to the frequency reported by Ahmed and Avasarala i.e 12.7%¹⁴ but it is higher than the study done by Singh MM et al. who reported it to be 4.2% UTI¹⁵. In Bangladesh, patients usually visit a doctor after experiencing severe complications for a disease condition. So, in a studies done by Bashir et al. and Rahman et al. higher frequency of UTI is reported i.e. 27% and 24.14%^{16,17}. In our study, UTI was most frequently found in age group 21-35 years, the results are similar to the other studies done. The incidence of UTI is higher in females than males, females have marked high percentage of the urine culture positivity i.e 90.15% and males 9.85% of total cultures sent for examination. Out of 192 strains, 175 were females and 17 were males. Similarity in observations has been seen in the studies done by Astal et al.²⁶, Khalifa et al.¹⁸, Bangladesh (Begum et al., 16.4% of female urinary tract infections in Dhaka).

The culture results usually show the Gram-negative intestinal bacteria as culprit, that mostly cause urinary tract infections, e.g E. coli, Klebsiella spp. And Proteus species¹⁹. The most commonly involved bacteria in UTI (80-85%) are E. coli. 30. In our study, the Escherichia coli had the largest of the groups with a frequency of 39%, then comes Pseudomonas sp 29% and then Klebsiella sp 19% and Proteus, Staphylococcus sp, and Candida were below 10%. Other researchers (Basir et al. and Saber et al. also indicated higher correlation of E. coli (66.67% and 77.8% patients respectively) in patients of UTI^{20,21}. Another study done in 2014 in Lahore shows the frequency of UTI is with the highest prevalence of E-coli (80%) then followed by Staphylococcus aureus (9.4%), Pseudomonas species (5.2%) and Proteus species 5.4%. In most of the studies conducted Escherichia coli has been the most prevalent organism.²²

CONCLUSION

The Urinary tract infections are more frequent in females as compared to males and enteric bacteria *E. coli* is the most prevalent pathogen among both males and females. Identification and diagnosis of microorganisms are important and very helpful for physicians to decide and treat these patients accordingly.

Author's Contribution:

Concept & Design of Study: Muhammad Amjad
 Drafting: Muhammad Shafiq
 Data Analysis: Muhammad Safdar
 Revisiting Critically: Muhammad Amjad, Muhammad Shafiq
 Final Approval of version: Muhammad Amjad

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Tanagho, Emil A, Mcaninch, Jack W. Smith's General Urology: United States of America. McGraw Hill companies Inc; Bacterial Infections of the genitourinary tract 2004;2:203-227.
2. Owa JA. Urinary tract infections in children, Pediatrics and child health in tropical region 2007;2(2).
3. Tessema B, Kassu A, Mulu A, Yismaw G. Predominant isolates of urinary tract pathogens and their antimicrobial susceptibility patterns in Gondar University Teaching Hospital North West Ethiopia. Ethiop. Med J 2007;(1):2007:61-67.
4. Car J. Urinary tract infections in women: diagnosis and management in primary care. BMJ 2006;(332): 94-97.
5. Bhat RG, Katy, TA, Place FC. Pediatric urinary tract infections. Emergency medicine clinics of North America 2011;29(3):637-653.
6. Vasquez A, Jakobsson T, Ahrne S, Forsum U, Molin G. Vaginal Lactobacillus Flora of Healthy Swedish Women. J Clin Micro 2002;40(8): 2746-2749.
7. John ED and Michel L. Urinary tract infections during pregnancy. J Am Fam Physician 2006; 61(3):713-720.
8. Starr C, Taggart RC. Biology the unit and diversity of life. Wards worth publishing Co. Belmont co 2002;(3):509-533.
9. Quigley. Diagnosis of Urinary Tract Infections in children. Curr Opin Pediatr 2009;21(2):124-128.
10. Masson P, Matheson S, Webster AC, Craig JC. Meta-analyses in prevention and treatment of urinary tract infections. Infect Dis Clin North Am 2009;(23):355-385.
11. Joseph TD. Urinary Tract Infections and Prostatitis. In: Wells BG, Schwinhart TL, Hamilton CW, editors. Pharmacotherapy Handbook. 7th ed. New York: McGraw-Hill;2008. p.493-503.
12. Kosokai NY, Kumaoto T, Hirose N, TankaY, Ltikichi S, Sigeta Y, et al. Comparative studies on activities of antimicrobial gaunt against causative organisms isolated from urinary tract infection of 1987.11 Background of patients. Japan J Antiriot 1990;43:954-67.
13. Palac DM. Urinary tract infection in women. A physician's perspective 1986;17-25.
14. Ahmed SM, Avasarala AK. Urinary tract infections (UTI) among adolescent girls in rural Karimnagar district, AP - K.A.P. STUDY. Ind J Prev Soc Med 2008;39(12):67-70.
15. Singh MM, Devi R, Garg S, Mehra M. Effectiveness of syndromic approach in management of reproductive tract infections in women. Indian J Med Sci 2001;55(4):209-214.
16. Bashar MA, Ahmed MF, Rahman SR, Gomes DJ. Distribution and Resistance Trends of Escherichia coli from Urinary Tract Infections Isolated in Dhaka City. Ban J Med Sci 2009;15(2):93-98.
17. Rahman F, Chowdhury S, Rahman MM, Ahmed D, Hossain A. Antimicrobial Resistance Pattern of Gram-negative Bacteria Causing Urinary Tract Infection. S J Pharm Sci 2009;2(1):44-50.
18. Bhowmick B K, Rashid H. Prevalence and antibiotic susceptibility of E coli Isolated from Urinary tract infections (UTI) in Bangladesh. Pak J Biol Sci 2004;7 (5):717-720.
19. Astal Z, Sharif F, Manama A. Antibiotic resistance of bacteria associated with community-acquired urinary tract infections in the southern area of the Gaza Strip. J Chemother 2002;14:259-64.
20. Khalifa BHA, Khedher M. Epidemiological study of Klebsiella spp. uropathogenic strains producing extended-spectrum betalactamase in a Tunisian University Hospital, 2009. Pathol Biol (Paris) 2012;60: e1-5
21. Begum N, Mamoon ABA, Hossain M, Begum N, Chowdhury SA, Rahman MF. UTI among female workers in a selected garment industry of Dhaka city: A cross sectional study. The ORION Med J 2006; 23:325-327.
22. Bova JG, Potter JL, Arevalos E, Hopens T, Goldstein HM, Radwin HM. Renal and perirenal infection: to the role of computerized tomography. J Urol 1985; 133:375-8.
23. Nicolle LE. Resistant pathogens in urinary tract infections. J Am Geriatr Soc 2002;50: S230-5

A Retrospective Study on the Principal of "No Space-No Cell" to Reduce Epithelial Cell Proliferation Resulting in Reduced Posterior Capsular Opacification Following Cataract Surgery

Ali Afzal Bodla and Muhammad Afzal Bodla

ABSTRACT

Objective: To identify achievable factors that can lead to reduction in incidence of posterior capsular opacification by control of postoperative epithelial cells proliferation and migration by good anatomic relation of IOL in the capsular bag.

Study Design: Retrospective study

Place and Duration of Study: This study was conducted at the Multan Medical and Dental College and Bodla Eye Care, Multan from August 2016 till July 2018.

Materials and Methods: A retrospective study performed at Multan Medical and Dental College and Bodla Eye Care, Multan on patients who had cataract extraction with intra ocular lens implant procedure by two surgeon. Retrospective analysis of 250 Eyes of 137 male and 113 female patients, who underwent phacoemulsification on ALCON, Infiniti system was done. Posterior chamber lens used was ALCON MA30AC multipiece posterior chamber lens with optic size of 6.0mm and over all length of 13.0 mm. Its a modified C-loop lens with anterior asymmetric biconvex configuration. Patients were followed up and incidence of posterior capsular opacification was observed, retrospectively for two years.

Results: A total of 250 patients were included in the study who completed the desired follow up span of 24 months to identify the incidence for posterior capsular opacification. Sex incidence shows 55% male and 45% females. Among different types of cataracts, 133 were cortical (53.2%), 65 Nuclear (26%), and 52 posterior capsular (20.8%) Incidence of PCO, after a follow-up period 24 months, was observed to be 15.2%. In first 6 months, only 4 patients (<2%) presented with posterior capsular opacification, while in 12 months 8 males and 2 females (4%) developed posterior capsular opacification. In 18 months period, number of patients with posterior capsular opacification increased to 16 males and 8 females (9.6%), and finally at 24 months, out of 137 males, 14 developed, posterior capsular opacification and out of 113 females, 5 developed posterior capsular opacification. Thus in 24 months, out of 250 eyes, 38 eyes developed posterior capsular Opacification, bringing an overall incidence to 15.2%.

Conclusion: Our study looked at the surgical techniques and factors pivotal to reduce incidence of posterior capsular opacification in patients undergoing cataract surgery. We believe that use of ALCON MA30AC multipiece posterior chamber lens with optic size of 6.0mm and overall length of 13.0 mm provided greater surface area of optic in contact with posterior capsule and is still a valid alternative to single piece PMMA lenses. Its overall length keeps the capsular bag taut with a symmetrical stretch, not allowing wrinkles formation. Thus a well fitted IOL, with atraumatic surgery, complete cortical clean up, and posterior capsular polishing, delays PCO by contact inhibition and barrier effect, to epithelial cells proliferation, and migration, on the principal of "No space No cells."

Key Words: Cataract Extraction. Posterior Capsular Opacification, Intraocular Lens.

Citation of articles: Bodla AA, Bodla MA. A Retrospective Study on the Principal of "No Space-No Cell" to Reduce Epithelial Cell Proliferation Resulting in Reduced Posterior Capsular Opacification Following Cataract Surgery. Med Forum 2018;29(9):68-71.

INTRODUCTION

Posterior capsular opacification (PCO), is a major persisting complication of phaco emulsification cataract

Department of Ophthalmology, Multan Medical and Dental College & Bodla Eye Care, Multan.

Correspondence: Ali Afzal Bodla, Associate Professor of Ophthalmology, Multan Medical and Dental College & Bodla Eye Care, Multan.

Contact No: 03039363917

Email: alibodla@aol.com

Received: August, 2018;

Accepted: September, 2018

surgery.¹ Severe opacification, which impairs visual function, should be rare within the first three months, following cataract surgery, and has a higher incidence in younger patients². Time to, onset of opacification, following cataract surgery is variable, as is the frequency of YAG capsulotomies performed¹. Etiologic and pathogenic factors of PCO include the proliferation and migration of remnant lens epithelial cells that can form pearls, or fibrosis on the posterior lens capsule^{3, 1}. Posterior capsular opacification may be reduced by thorough cortical clean-up⁴ and atraumatic surgery, thus reducing inflammation from excessive disruption of the blood-aqueous-barrier^{3, 1}. There are other note able

mechanisms of posterior capsular opacification that includes proliferation/migration of residual lens epithelial cells (Equatorial cells)⁵, remnants of lens epithelial cells beneath the anterior capsule edge (Cuboidal cells), fibrous dysplasia of residual lens epithelial cells observed in pseudo exfoliation and other pathologies, causing weakened zonules⁶, capsulorhexis opening is of the same size or larger than, the optic diameter⁷ and last but not the least is blood-aqueous barrier disruption causing fibrin formation³ and migration of cells on posterior capsule.

Capsular opacification is primarily classified as anterior and posterior. In our study we primarily aim to address the latter type as this is the main limiting factor in compromised visual acuity post cataract extraction. Posterior capsular opacification has been referred to secondary cataract in many previous studies. It can present primarily as fibrous changes, pearl formation or a combination of both.

In the past studies a very important limiting factor mentioned is adequate placement of intraocular lens with posterior capsule.^{7,8} In our study, surgeons ensure to follow the desired techniques to achieve the optimum balance without damaging posterior capsule.^{9,10} It was ensured that viscoelastic is removed behind the posterior lens surface in order to decrease the potential space for cell migration. The choice of lens again is to enhance the firm placement of optic in order to achieve the desired "no space, no cells" effect.

MATERIALS AND METHODS

This is a retrospective interventional non-comparative study of 250 eyes who underwent cataract surgery by phaco emulsification. Surgical platform used at both centres was ALCON Infiniti microsurgical system. Intraoperative use of disposables was standardised to ALCON 2.75 mm keratome and ALCON Provisc as the choice of viscoelastic material. It was ensured to achieve a complete cortical cleanup and posterior capsular polishing was performed in required cases using polishing mode of ALCON Infiniti surgical platform. At the end of every surgery it was ensured that optic is appropriately centred in the capsular bag. Patients with anterior or posterior capsular rent were excluded from the surgery.

Patients had a standardized follow up planned on day 1, month 1 and afterwards eight quarterly visits spanned over a period of two years. Patients had a visual acuity check using snellen chart, followed by dilated slit lamp assessments. Development of posterior capsular opacification was identified by clinical assessment of posterior capsule. Regardless of visual acuity, taking in to account other contributing factors as cystoids macular oedema, diabetic maculopathy etc, clinical development of Elsching's pearls formation, and or capsular fibrosis is taken as the bench mark for the development of posterior capsular opacification.

Retrospective analysis was done from the data collected from a period of two years from August 2016 till July 2018.

RESULTS

A total of 250 patients were included for data collection. Age range was from 34 to 78 years. Exclusion criteria was any pre or postoperative complications as well as patients who lost to follow up. Out of total number of patients there were approx 55% male and 45% female patients. Among different types of cataracts, 133 were cortical (53.2%), 65 Nuclear (26%), and 52 posterior capsular (20.8%). Incidence of PCO, after a follow-up period 24 months was identified using slit lamp retroillumination system. Total incidence was observed to be 15.2%. Incidence gradually increased over a period of two years starting from 2% in first six months to reaching 15.2% over a period of two years. The incidence of capsular opacification mentioned in different studies is from as low as <5% to as high as 50%, hence our rate was in accordance with the documented data.

MA30AC proved to be a good choice of intraocular lens implant as practically none of the patients had any noticeable postoperative optic displacement. Intraocular lens centration was found to be very adequate.

DISCUSSION

Posterior Capsular Opacification usually causes a visual acuity decrease by direct blockage of the visual axis.¹¹ Range of the complaints of Posterior Capsular Opacification can be very variable.¹² Some patients with severe Posterior Capsular Opacification have no complaints while other with minimal have more difficulty.^{11,14} Most cases of clinically significant Posterior Capsular Opacification are caused by postoperative proliferation and migration of residual epithelial cells and their derivatives after cataract surgery. Cells having the potential to produce significant opacification and visual reduction are cuboidal, anterior epithelial cells and epithelial cells at the equatorial lens bow, that have significant mitotic activity.^{12,15} Posterior Capsular Opacification can be caused by fibrosis (cuboidal epithelium), epithelial pearl formation (equatorial epithelium), or generalised haze.¹⁶ Fibrosis is due to transformation of macrophages to fibroblasts and occurs even if the posterior capsule is opposed to the lens optic.¹⁷ Contact between the optic and the posterior capsule frequently acts, as a barrier to epithelial cells migration, as germinal epithelial cells attempt to spread across the capsule.¹⁸ A major goal of surgeons is to control the postoperative proliferation and migration of lens epithelial cells that may lead to Posterior Capsular Opacification.^{14,19} Most cases of clinically significant Posterior Capsular Opacification occurs more frequently after cataract extraction without intra ocular

lens implantation than in eyes with intra ocular lens in place, and the amount of Posterior Capsular Opacification can vary considerably with the design and configuration of the intra ocular lens.^{20,21} There is an important relationship between the posterior aspect of the IOL optic and the adjacent posterior capsule in providing a mechanical barrier to migration of epithelium into the visual axis.^{19,22} A well fitted intraocular lens delays Posterior Capsular Opacification by contact inhibition and barrier effect. Lenses that are too small would not keep the back taut, causing many extra folds in the capsule. Overall large lenses stretch the capsule producing wrinkles allowing epithelial cells to migrate and cause PCO.^{20,22} The clinical and laboratory findings provide strong evidence that the concepts of a barrier effects and "No space No cells" defined in terms of the anatomic relation of the IOL to the surrounding capsular compartment, are valid and important in understanding the pathogenesis, and prevention of at least some forms of Posterior Capsular Opacification.¹⁸ Authors believe that despite of most modern single piece PMMA lenses, multipiece options as MA30AC holds its value with an optic size of 6.0 mm, greater over all length and a C-loop haptic design to keep capsular bag taught.^{7,22} It ensures minimal cell migration from periphery to centre and a symmetrical stretch of the capsular bag not allowing wrinkles formation. A well fitted intraocular lens with atraumatic surgery, complete cortical clean up, and posterior capsular polishing, delays PCO by contact inhibition and barrier effect, to epithelial cells proliferation, and migration, on the principal of "NO space No cells".

CONCLUSION

In conclusion Posterior Capsular Opacification still remains a challenge in modern day surgery. The aim to have a clear posterior capsule still remain a top priority. In our study we have tried to high light the possible avoidable causes that can be practiced in less than ideal third world settings as in our country to reduce the incidence of posterior capsular opacification. The choice of intraocular lens remains pivotal as well as the stress on optimum surgical techniques as capsule polishing and reduction of optic and posterior capsule interface.

Author's Contribution:

Concept & Design of Study:	Ali Afzal Bodla
Drafting:	Ali Afzal Bodla, Muhammad Afzal Bodla
Data Analysis:	Muhammad Afzal Bodla
Revisiting Critically:	Ali Afzal Bodla, Muhammad Afzal Bodla
Final Approval of version:	Ali Afzal Bodla

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. McCarty CA, Taylor HR. A review of the epidemiologic evidence linking ultraviolet radiation and cataracts. *Dev Ophthalmol* 2002; 35:21.
2. Vasavada AR, Chauhan H, Shah G. Incidence of posterior capsular plaque in cataract surgery. *J. Cataract Refract Surg* 1997;23(5):798.
3. Obstbaum SA. The anterior capsulotomy revisited. *J. Cataract Refract Surg* 1998;24(2):143.
4. Saika S, Miyamoto T, Ohnishi Y. Histology of anterior capsule opacification with a polyHEMA/HOHEXMA hydrophilic hydrogel intraocular lens compared to poly(methyl methacrylate), silicone, and acrylic lenses. *J Cataract Refract Surg* 2003;29(6):1198.
5. Apple DJ, Solomon KD, Tetz MR, Assia EI, et al. Posterior capsule opacification. *Surv. Ophthalmol* 1992;37(2):73. Review.
6. Spencer TS, Mamalis N, Lane SS. Interlenticular opacification of piggyback acrylic intraocular lenses. *J. Cataract Refract Surg* 2002;28(7):1287.
7. Wolken MA, Oetting TA. Linear posterior capsule opacification with the AcrySof intraocular lens. *J. Cataract Refract Surg* 2001;27(11):1889.
8. Thompson AM, Sachdev N, Wong T, Riley AF, et al. The Auckland Cataract Study: 2 year postoperative assessment of aspects of clinical, visual, corneal topographic and satisfaction outcomes. *Br. J. Ophthalmol* 2004;88(8):1042.
9. Buehl W, Sacu S, Findl O. Association between intensity of posterior capsule opacification and visual acuity. *J. Cataract Refract Surg* 2005; 31(3):543.
10. Meacock WR, Spalton DJ, Boyce J, Marshall J. The effect of posterior capsule opacification on visual function. *Invest Ophthalmol. Vis. Sci* 2003; 44(11):4665.
11. Vetrugno M, Masselli F, Greco G, Sisto D, et al. The influence of posterior capsule opacification on scanning laser polarimetry. *Eye* 2007;21(6):760.
12. Izak AM, Werner L, Pandey SK, Apple DJ. Pathological evaluation of postmortem human eyes implanted with a new single-piece hydrophobic acrylic lens. *J. Cataract Refract Surg* 2004; 30(7):1537.
13. Wallentin N, Lundgren B, Holmen JB, Lundberg C. Development of posterior capsule opacification in the rabbit. *Ophthalmic. Res* 2002;34(1):14.
14. Choi J, Park SY, Joo CK. Hepatocyte growth factor induces proliferation of lens epithelial cells through activation of ERK1/2 and JNK/SAPK. *Invest Ophthalmol. Vis Sci* 2004;45(8):2696.
15. El-Osta AA, Spalton DJ, Marshall J. In vitro model for the study of human posterior capsule

- opacification. J Cataract Refract Surg 2003; 29(8):1593.
16. McLean SM, Mathew MR, Kelly JB, Murray SB, et al. Detection of integrins in human cataract lens epithelial cells and two mammalian lens epithelial cell lines. Br J Ophthalmol 2005;89(11):1506.
 17. Auffarth GU, Brezin A, Caporossi A, Lafuma A, et al. European PCO Study Group. Comparison of Nd YAG capsulotomy rates following phacoemulsification with implantation of PMMA, silicone, or acrylic intra-ocular lenses in four European countries. Ophthalmic.Epidemiol. 2004;11(4):319-329.
 18. Buehl W, Sacu S, Findl O. Association between intensity of posterior capsule opacification and contrast sensitivity. Am J Ophthalmol 2005;140(5):927.
 19. Buehl W, Findl O, Menapace R, Georgopoulos M, et al. Reproducibility of standardized retroillumination photography for quantification of posterior capsule opacification. J. Cataract Refract Surg 2002;28(2):265–270.
 20. Barman SA, Hollick EJ, Boyce JF, Spalton DJ, et al. Quantification of posterior capsular opacification in digital images after cataract surgery. Invest Ophthalmol Vis Sci 2000;41(12): 3882–3892.
 21. Spalton DJ. Methods of quantifying posterior capsule opacification. J. Cataract Refract Surg 2003;29(7):1247.
 22. Wormstone IM. Posterior capsule opacification: a cell biological perspective. Exp Eye Res 2002;74(3):337.

Pain Free Negative Pressure Wound Therapy

Obaid Ur Rahman¹, Moiz Sadiq¹, Ali Adnan¹, and Syed Sheeraz Ur Rahman²

ABSTRACT

Objective: Wound vacuum-assisted closure (VAC) is a technique used frequently by orthopedic surgeons to facilitate wound closure. Bedside VAC removal can be a source of great pain for patients, which we hypothesize can be decreased by topical lidocaine application.

Study Design: Prospective randomized double-blinded study

Place and Duration of Study: This study was conducted at the Plastic and Reconstructive Surgery Department of Liaquat National Hospital, Karachi from November 2015 to October 2017.

Materials and Methods: Non diabetic, adult patients requiring at least 2 extremity wound VAC dressing changes were involved. In a double-blinded fashion using crossover intervention technique, topical lidocaine (1%) was compared with topical normal saline (0.9% NaCl) after injection into the VAC sponge. The patients were evaluated using visual analog pain scores.

Results: A total of 72 patients were enrolled for a total of 144 VAC changes. The lidocaine infiltration was associated with 2.03 points less on the 0–10 visual analog scale for pain (P value <0.0001, during the VAC sponge removal).

Conclusion: The patients undergoing an extremity wound VAC dressing removal at the bedside should be pretreated with topical lidocaine because it decreases pain.

Key Words: Wound Vacuum-Assisted Closure Dressing, Soft-Tissue Management, Pain Management, NPWT, VAC

Citation of articles: Rahman O, Sadiq M, Adnan A, Rahman SS. Pain Free Negative Pressure Wound Therapy. Med Forum 2018;29(9):72-75.

INTRODUCTION

Vacuum-assisted closure (VAC) is a wound care technique that promotes wound healing by negative pressure on wound. This has been well documented in literature since 1970s¹⁻⁴. NPWT is becoming a popular modality of treating acute wounds by many field of surgery and medicine³⁻¹¹ and treating diabetic foot ulcers and chronic wounds.¹¹⁻¹³ NPWT mechanically removes fluid from the wound, enhancing accelerated rate of granulation tissue formation, increased local blood perfusion and nutrient flow, a significant reduction in tissue bacteria levels^{14,15}. Plastic surgeons commonly employ NPWT for several wound like wounds to which a split-thickness autologous skin graft is applied, infected wounds after debridement, open fracture wounds, acute soft tissue wounds (with exposed tendon, bone, hardware, and/or joint), fasciotomy wounds after compartment syndrome, chronic nonhealing wounds, surgical wounds that are

difficult to close due to tension, wounds associated with moderate-to-severe irritation or drainage.⁵ Despite its efficacy, the literature analyzing pain management associated with NPWT is scant.^{3,6} Based on our clinical experience and few reports acknowledging pain associated with wound VAC dressings,²⁻⁶ removal of the dressing usually is a particularly painful experience for patients; this is often perceived as a side effect to NPWT therapy. The essential, painful step involves removing the embedded foam from the wound bed, which is often extremely painful as healing granulation tissue containing regenerating nerve endings grow into the reticular network of the foam.⁵ Although intravenous (i.v.) or oral (p.o.) pain medication dosage before the procedure are usually recommended and irrigation of foam with saline is the most commonly used technique for analgesia, it has been our hospital's experience that diluted lidocaine, infiltrated retrograde up the suction tube, can provide better analgesia than pain medications alone. The purpose of this study is to support the use of lidocaine to reduce pain associated with wound VAC dressing changes.

MATERIALS AND METHODS

This is a randomized, double-blinded, placebo controlled trial comparing the use of lidocaine with a normal saline for pain management during the removal of wound VAC dressings. Ethical committee approval was obtained before enrolling patients for the study.

¹. Department of Plastic Surgery / General Surgery², Liaquat national hospital, Karachi.

Correspondence: Dr. Obaid Ur Rahman, Consultant Plastic Surgeon, Department of Plastic Surgery, Liaquat national hospital, Karachi.

Contact No: 0333-2345481

Email: our_86@hotmail.com

Received: April, 2018;

Accepted: June, 2018

The design for this study relies upon the crossover intervention technique in which each study participant receives both possible interventions. The benefit of this technique is that each subject serves as his/her own control, making it ideal for prevention of confounding due to patient related differences, such as age, gender, educational status, base line pain tolerance, wound size, site, therefore this technique significantly strengthens the power of the study by reducing the number of subjects needed for study.

Our inclusion criteria included

- Patients aged 18 or older
- Extremity wound VAC requiring at least two bedside VAC changes during a single hospital admission

Our exclusion criteria included

- Lidocaine allergy
- Diabetic or neuropathic wounds
- Local malignancy
- Pregnancy

We hypothesized that topical lidocaine would be a useful alternative or supplement to analgesic medications during wound VAC dressing removal. Once these criteria were satisfied, patients underwent the informed consent process for participation. Patient characteristics were then documented, including age, sex, wound size, location, and mechanism of injury into a predesigned proforma. Two bedside VAC dressing removals, each approximately 48 hours from the time of VAC dressing placement, were then scheduled. A standard VAC dressing, which consisted of reticulated polyurethane foam contoured to and embedded into the wound, covered with an occlusive dressing connected to an evacuation tube and a suction canister set intermittently at -125 mm Hg.

For each of 72 patients, one author prepared double-blinded samples of both 1% lidocaine and 0.9% normal saline in a clear syringe, labeled with the patient's name and either VAC change #1 or #2. The lidocaine dose was based on the standard maximum weight based dose of subcutaneous injectable lidocaine (4.5 mg/kg, with a maximum dose of 300 mg or 30 mL of 1% lidocaine).⁽¹⁶⁾ The volume of normal saline was dosed to match the same volume of the calculated lidocaine volume. Patients were then asked to blindly choose one syringe for each session of VAC change randomly. Second author performed all the VAC sponge removals. Twenty minutes before VAC dressing removal, all patients rated their baseline wound pain on the 0–10 visual analog scale (VAS) and the solution of their choice either lidocaine or saline was injected retrograde up the VAC suction tube into the sponge. Twenty minutes later, during VAC sponge removal, all the patients rated their pain. During this period, the patients and their vital signs were monitored for local or systemic toxicity or adverse reaction.

RESULTS

we enrolled 78 patients who satisfied our inclusion and exclusion criteria for participation in this study. 6 patients refused to complete to complete the trial and were excluded. Patient characteristics are shown in Table 1. There were no local or systemic complications of the topical lidocaine. The randomization produced balance between the study drug and the study period, with lidocaine being given in the first period 33 out of 72 times and in the second period 39 out of 72 times. Controlling for baseline pain, the patients experienced mean of 2.03 points less pain on the 10-point VAS during the VAC sponge removal when given lidocaine locally than when given saline [95% confidence interval, P-value <0.0001]. As demonstrated in Figure 1. All the patients had an increase in pain above baseline during VAC sponge removal, this increase in pain above baseline, however, was less so after lidocaine administration [95% confidence interval, P-value <0.0001]. Although not powered to detect a correlation between pain and wound size. There were no adverse outcomes or toxicities related to topical lidocaine administration. Furthermore, there were no known adverse outcomes of wound VAC therapy as all wounds ultimately healed. This study, however, was not designed to evaluate the effect of wound VAC therapy with lidocaine administration on wound healing.

Table No.1: Patients Characteristics(Crossover intervention design), including age, gender, wound size, wound type, wound location and adverse events.

Total Patients	N=72
Total VAC changes	144
Mail, female	52,20
Ages (yrs)	
Mean±SD	38±15
Min-Max	18-54
Wound size (cm)	
Mean±SD	133±130
Min-Max	16-408
Wound location, n	
Leg	36
Ankle	10
Thigh	7
Knee	14
Shoulder	1
Forearm	4
Wound type, n	
Fasciotomy	4
Gunshot	3
Chronic	16
Open fracture	19
Grafting	22
Wound infection	8
Adverse reactions	0

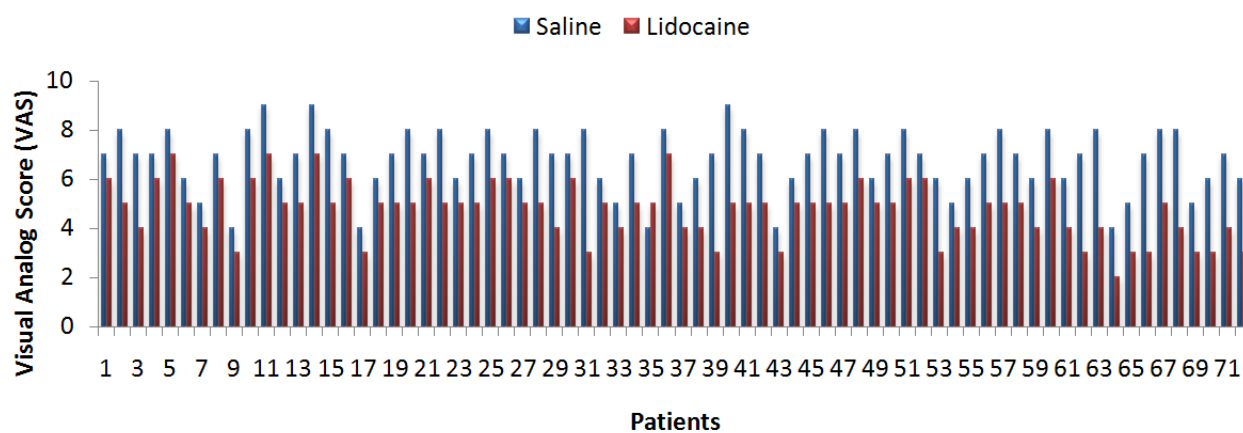


Figure No.1: Pain Scores

DISCUSSION

Although wound NPWT is a major advancement in wound management armamentarium, pain is only major side effect, frequently imposing anxiety and distress for patients. Pain is documented and treated as the fifth vital sign (6, 18–20). Lidocaine is a commonly used local anesthetic amino amide compound with an excellent track record with incidence of allergic reaction is approximately 0.7%. (17). Our study agree with the data from Franczyk et al.(6) which demonstrates a 2.0-point difference on the VAS scale during VAC removal.

Despite encouraging data, the major limitation of these studies is the usage of pain medication during the study period, the timing of VAC changes as longer duration of VAC is more painful to be removed. All VACs in this study were removed after being in place for 48 hours. Although no ideal duration of treatment or frequency of VAC change has been established in the literature. Although this study demonstrates the utility of lidocaine for VAC changes, it does not define the ideal lidocaine dose or dosing method. Further investigation is therefore necessary to define the dose, volume, and timing of lidocaine needed to provide adequate analgesia in relation to different types and sizes of wounds.

CONCLUSION

Topical lidocaine can be used for wound VAC dressing changes to decrease pain.

Acknowledgement: I would like to acknowledge Prof. Shehab A Beg as my teacher, and I am gratefully indebted to his valuable comments on this paper. I would also like to appreciate staff and management of Liaquat national hospital Accident and Emergency department for their cooperation.

Finally, I must express my very profound gratitude to my parents and to my wife for providing me with unfailing support and continuous encouragement

throughout my years of study and through the process of researching and writing this paper. This accomplishment would not have been possible without them. Thank you.

Author's Contribution:

Concept & Design of Study: Obaid Ur Rahman

Drafting: Moiz Sadiq

Data Analysis: Syed Sheeraz Ur Rahman, Ali Adnan

Revisiting Critically: Obaid Ur Rahman, Moiz Sadiq

Final Approval of version: Obaid Ur Rahman

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Fox JW, Golden GT. The use of drains in subcutaneous surgical procedures. *Am J Surg* 1976;132:673–674.
2. Fay MF. Drainage systems. Their role in wound healing. *AORNJ* 1987;46:442–455.
3. Evans D, Land L. Topical negative pressure for treating chronic wounds. *Cochrane Database System Rev* 2001;(1): CD001898.
4. Wasiak J, Cleland H. Topical negative pressure (TNP) for partial thickness burns. *Cochrane Database System Rev* 2007;(3): CD006215.
5. Webb LX. New techniques in wound management: vacuum-assisted wound closure. *J Am Acad Orthop* 2002;10:303–311.
6. Franczyk M, Lohman RF, Agarwal JP, et al. The impact of topical lidocaine on pain level assessment during and after vacuum-assisted closure dressing changes: a double-blind, prospective, randomized study. *Plast Reconstr Surg* 2009;124:854–861.
7. Argenta PA, Rahaman J, Gretz HF 3rd, et al. Vacuum-assisted closure in the treatment of complex gynecologic wound failures. *Obstet Gynecol* 2002;99:497–501.

8. Harlan JW. Treatment of open sternal wounds with the vacuum-assisted closure system: a safe, reliable method. *Plastic Reconstr Surg* 2002;109: 710–712.
9. Garner GB, Ware DN, Cocanour CS, et al. Vacuum-assisted wound closure provides early fascial reapproximation in trauma patients with open abdomens. *Am J Surg* 2001;182:630–638.
10. Chang KP, Tsai CC, Lin TM, et al. An alternative dressing for skin graft immobilization: negative pressure dressing. *Burns* 2001;27:839–842.
11. McCallon SK, Knight CA, Valiulus JP, et al. Vacuum assisted closure versus normal saline-moistened gauze in the healing of postoperative diabetic foot wounds. *Ostomy Wound Manage* 2000;46:28–32.
12. Eginton MT, Brown KR, Seabrook GR, et al. A prospective randomized evaluation of negative-pressure wound dressings for diabetic foot wounds. *Ann Vasc Surg* 2003;17:413–417.
13. Ford CN, Reinhard ER, Yeh D, et al. Interim analysis of a prospective, randomized trial of vacuum-assisted closure versus the healthpoint system in the management of pressure ulcers. *Ann Plast Surg* 2002;49: 55–61.
14. Morykwas MJ, Faler BJ, Pearce DJ, et al. Effects of varying levels of subatmospheric pressure on the rate of granulation tissue formation in experimental wounds in swine. *Ann Plast Surg* 2001;47: 547–551.
15. Morykwas MJ, Argenta LC, Shelton-Brown EI, et al. Vacuum-assisted closure: a new method for wound control and treatment: animal studies and basic foundation. *Ann Plasti Surg* 1997;38: 553–562.
16. Hardman JG, Limbird LE, Gilman AG. Local anesthetics. Goodman & Gilman's the Pharmacological Basis of Therapeutics. 10th ed, The McGraw-Hill Companies, New York; 2001.p. 374–378.
17. Pratt MD, Belsito DV, DeLeo VA, et al. North American Contact Dermatitis Group patch-test results, 2001–2002 study period. *Dermatitis* 2004;15:176–183.
18. Phillips DM. JCAHO pain management standards are unveiled. *JAMA* 2000;284:428–429.
19. The Joint Commission [Internet]. Oakbrook Terrace, IL, c2010. Available at: <http://www.jcaho.org>. Accessed March 31, 2010.
20. U.S. Department of Veterans Affairs [Internet]. Washington, DC, c2010. Available from: http://www.va.gov/pain_management. Accessed March 31, 2010.

Prevalence of Hepatitis B and Hepatitis C in Transfusion Dependent Thalassemia Patients

Iftikhar Ahmed, Shahid Iqbal and Aida Waheed

ABSTRACT

Objective: The objective of this study was to determine the prevalence of transfusion transmitted diseases such as viral hepatitis B and C in thalassemic patients.

Study Design: Descriptive / cross section study

Place and Duration of Study: This study was conducted at the Department of Pediatrics, Sheikh Khalifa Bin Zayed Teaching Hospital, Rawalakot AJK (Teaching Hospital of Poonch Medical College, Rawalakot from November 2016 to May 2017).

Materials and Methods: 55 thalassemic patients were screened for transfusion transmitted hepatitis B and C virus using electro chimiluminescence using auto analyzer elecsys Cobas E 411 as well as PCR techniques where possible. The outcome i.e., hepatitis B and C infection was stratified by age, parity and duration of transfusion.

Results: The prevalence of transfusion transmitted hepatitis C was 30.91% in our study and it had a statistically significant association with the age and duration of blood transfusion in thalassemic patients. Hepatitis B was not positive in any patient.

Conclusion: High prevalence of transfusion transmitted hepatitis C in thalassemic patients despite adoption of donor blood screening protocols needs to be addressed urgently to determine the factors responsible for this complication of transfusion therapy.

Key Words: Thalassemia, Transfusion, Viral Hepatitis, Cirrhosis liver, Chelation, Hepatitis C

Citation of articles: Ahmed I, Iqbal S, Waheed A. Prevalence of Hepatitis B and Hepatitis C in Transfusion Dependent Thalassemia Patients. Med Forum 2018;29(9):76-79.

INTRODUCTION

Thalassemia, an autosomal-recessive disorder, is an important cause of severe anemia in children and young adults. Incidence of thalassemia is particularly high in a geographical area extending from South East Asia to Middle East affecting Burma and Indian subcontinent as well.¹ The disease burden of thalassemia in Pakistan is very high and according to recent estimates, every year about five thousand infants homozygous for thalassemia are born.² The thalassemic patients are dependent on regular blood transfusions throughout their life for survival and even though regular blood transfusions better the survival of thalassemic patients as a whole, they are exposed to a significant risk of transfusion associated infections, particularly blood-borne viral infections.³

Thalassemic patients who have received multiple blood transfusions are more likely to develop post-transfusion viral hepatitis such as Hepatitis B and Hepatitis C.⁴ Among the two, Hepatitis C is the leading reason for post-transfusion hepatitis in this patient population and it contributes to the morbidity and mortality associated with thalassemia owing to its complications in the long-term such as cirrhosis of liver and hepatocellular cancer.^{5,6} Hepatitis C poses a major evolving health issue in the third world for the general population as a result of inadequate policies for Hepatitis C prevention and infection control.⁷ It has been estimated that Hepatitis C is responsible for up to 90% of transfusion associated infections in thalassemic patients.⁸ Even though Hepatitis C is a widely prevalent public health problem across the world,⁹ and is known to affect more than 200 million worldwide with a prevalence rate varying from 0.2%-40%.^{10,11} The prevalence of hepatitis B is much more than that of Hepatitis C. It affects more than two billion people worldwide and is responsible for more than one million deaths annually.¹² A significant number of patients (more than twenty one million) diagnosed with Hepatitis C reside in the eastern Mediterranean region.¹³ The global prevalence of Hepatitis B and Hepatitis C in thalassemic patients in terms of Hepatitis B surface antigen positivity (HbsAg+) and anti-

Department of Department of Pediatrics, Sheikh Khalifa Bin Zayed Teaching Hospital, Rawalakot, AJK (Teaching Hospital of Poonch Medical College, Rawalakot AJK)

Correspondence: Iftikhar Ahmad, Associate Professor of Department of Pediatrics, Sheikh Khalifa Bin Zayed Teaching Hospital, Rawalakot, AJK.

Contact No: 0312-5084789

Email: 1_ahmed74@Yahoo.com

Received: April, 2018;

Accepted: July, 2018

Hepatitis C antibodies (Anti HCV) varies between 0.3%-5.7% and 4.4%-85.4% respectively.¹⁴

A number of risk factors have been found to be associated with acquisition of Hepatitis C and hepatitis B infection in thalassemic patients. These include increased age^{3,15}, duration of transfusion^{3,15}, parity¹ and HbsAg Seropositivity³. A recently published study from Egypt identified at least ten transfusions per year and age more than 10 years in addition to co-infection with Hepatitis B to be significantly associated with the risk of acquiring Hepatitis C infection.¹⁶

To reduce the risk of transmission of infections associated with transfusions, the donor blood is screened for common pathogens such as Hepatitis B, Hepatitis C and HIV. In view of lack of studies as well as data from this region and a huge variation in the reported prevalence of Hepatitis C in thalassemic patients from Pakistan, we decided to determine the prevalence of viral hepatitis B and C and the risk factors associated with the transmission of Hepatitis C in thalassemic patients registered with our department. We thought that the resulting information could be used to revise the current management strategies in place.

MATERIALS AND METHODS

This descriptive cross sectional study was conducted at the Department of Pediatrics, Sheikh Khalifa Bin Zayed Teaching Hospital, Rawalakot AJK (Teaching Hospital of Poonch Medical College, Rawalakot from November 2016 to May 2017. Fifty five thalassemic patients are registered with our department and they were enrolled in the study after obtaining an informed consent. Patients aged at least two years who were being transfused for thalassemia were enrolled in the study. They were assured of confidentiality and privacy. The patients receive regular blood transfusions as well as chelation therapy in our center. Three cc blood was drawn from antecubital vein of each patients under strict aseptic conditions and was sent to laboratory for HbsAg and anti HCV antibody levels by electro chemiluminescence using auto analyzer Elycsys Cobas E 411 . The patients who tested positive for anti-HCV by device method were contacted again and blood was drawn again for both qualitative and quantitative polymerase chain reactions to measure HCV viral DNA levels. Patients whose HCV was confirmed by PCR were then referred to a gastroenterologist for further management. The data was recorded by the investigators themselves. The data was entered into and analyzed using SPSS 16. Mean \pm SD were calculated for numerical variables while frequencies and percentages were calculated for categorical variables. The outcome i.e., hepatitis C infection was stratified by age, parity and duration of transfusion. Post stratification chi-square test was applied and a p value < 0.05 was taken to be significant.

RESULTS

This study enrolled fifty five thalassemic patients with a mean \pm SD age of 9.16 \pm 6.36 years and a range of 3-- 30 years. The mean duration of transfusion was 8.02 \pm 5.45 years. There were thirty (54.55%) males and twenty-five (45.45%) females in the study cohort. The frequency of hepatitis C positivity was 41.82% (n=23) initially which later dropped to 30.91% (n=17) after PCR assays. No patient was found to have HbsAg positivity. When the outcome i.e., Hepatitis C was stratified by age, parity and duration of transfusions a statistically significant association was found with age of the patients and duration of transfusion (p <0.05). Older thalassemic patients were more likely to acquire Hepatitis C. Similarly, those with a long duration of blood transfusion (i.e. more than 9 years) were also exposed to a risk of acquiring hepatitis C.

Table No.1: Cross tabulation of age and prevalence of hepatitis C in study population

Hepatitis C	Age of patients		Total	P value
	Upto 10 years	More than 10 years		
Present	6.00	11.00	17.00	0.001
Absent	31.00	7.00	38.00	
Total	37.00	18.00	55.00	

Table No.2: Cross tabulation of duration of treatment and prevalence of hepatitis C in study population

Hepatitis C	Age of patients		Total	P value
	Upto 9 years	More than 9 years		
Present	6.00	11.00	17.00	0.001
Absent	31.00	7.00	38.00	
Total	37.00	18.00	55.00	

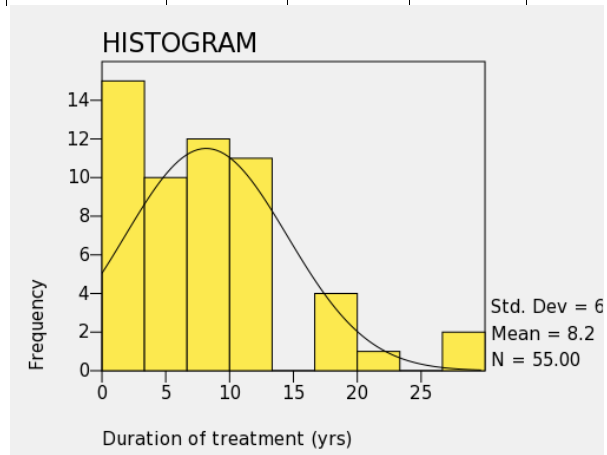


Figure No.1: Duration of treatment of study population

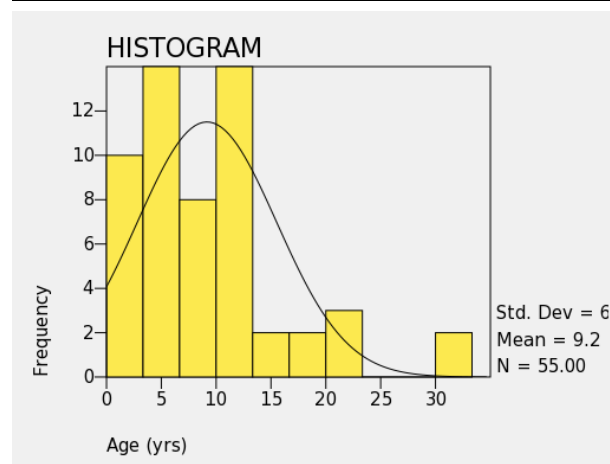


Figure No.2: Age of study participants

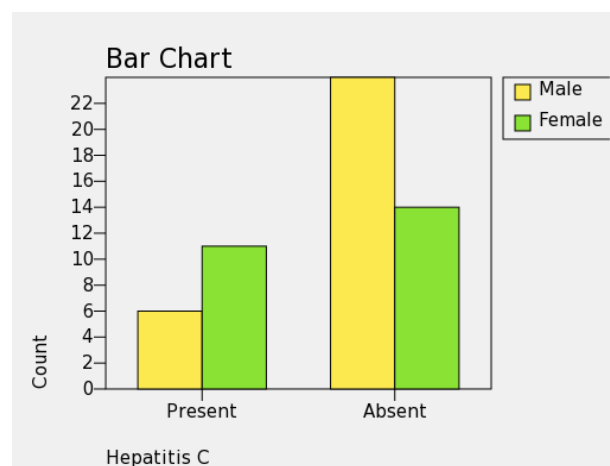


Figure No.3: prevalence of hepatitis C according to the gender of study population

DISCUSSION

Among the single-gene autosomal disorders, β -thalassemia is one of the commonest disorders. β -thalassemia is the commonest form of thalassemia and is known to affect more than 150 million people across 60 countries.¹⁷ Regular and timely blood transfusion is a necessary component of thalassemia management to ensure survival and prevention of complications arising from severe anemia in these patients. However, these patients are exposed to a lifetime risk of acquiring transfusion associated infections, particularly HIV, Hepatitis C and Hepatitis B.¹⁸

The objective of this study was to determine the prevalence of hbsAg and anti-HCV antibodies in thalassemic patients from rawalakot AJK region. β -thalassemia major was the common form of thalassemia in this study and was present in 96.3% of patients. The rest had β -thalassemia intermedia. Similar prevalence rates have been reported from this region: 96% and 4% for β -thalassemia major and β -thalassemia intermedia respectively from Rawalpindi¹, 93% and 7% for β -

thalassemia major and β -thalassemia intermedia respectively from Faisalabad¹⁷ and 87% and 13% respectively for β -thalassemia major and β -thalassemia intermedia from India.¹⁹ The prevalence of Hepatitis C was 30.91% in this study which, even though, is quite high but is similar to other reports from different regions of Pakistan.^{1,20,21}

Though the majority of patients in this study was male ($n=30$; 54.55%), the number of affected females was almost twice that of affected males (11 vs 6). This is interesting since the opposite of this trend has been observed elsewhere in studies from Pakistan.^{1,8,14} In this study, the mean serum ferritin level was found to be more in affected females than in the affected males however, this was found to be statistically insignificant ($p > 0.05$). Though this fact can be explained by the number of affected females as well as the difference in age of affected males and females where females, by virtue of their increased age had received more transfusions than the males. The increased serum ferritin levels also suggested the state of compliance with chelation therapy which, considering the socioeconomic status is not affordable for everyone all the time.

In our study, majority of patients belonged to first parity followed by third and second parity. Similar findings have been reported by Shah and colleagues who reported that more than half of their patients (56.7%) belonged to first parity. 38.3% of their patients belonged to third parity and only 5 % belonged to second parity.²² However, A number of studies have reported second parity to be most common among Pakistani thalassemic patients.^{1,17}

In addition to risk factors for HCV sero-positivity mentioned above, increased serum ferritin, transfusion at an early age have also been identified as risk factors for acquiring HCV infection in thalassemic patients.¹ However, we found that increasing age and duration of transfusion treatment were significantly associated with the risk of acquiring HCV infection.

Despite the fact that screening procedures for blood transfusions have been adopted in Pakistan and have been in place for decades now, increased prevalence of Hepatitis C in multi-transfused thalassemic patients is a worrying scenario. This is a serious complication of transfusion therapy for thalassemic patients and needs to be addressed on war-footing. Public health policy planning and implementations should focus on this problem and guidelines need to be developed for management of β -thalassemia in Pakistan that should also address the prevention of blood-borne infections in this population.

CONCLUSION

High prevalence of transfusion transmitted hepatitis C in thalassemic patients despite adoption of donor blood screening protocols needs to be addressed urgently to

determine the factors responsible for this complication of transfusion therapy.

Author's Contribution:

Concept & Design of Study: Iftikhar Ahmed
 Drafting: Shahid Iqbal
 Data Analysis: Aida Waheed
 Revisiting Critically: Iftikhar Ahmed, Shahid Iqbal
 Final Approval of version: Iftikhar Ahmed

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

- Din G, Malik S, Ali I, Ahmed S, Dasti JI. Prevalence of hepatitis C virus infection among thalassemia patients: a perspective from a multi-ethnic population of Pakistan. *Asian Pac J Trop Med* [Internet]. 2014 [cited 2018 Jan 3];7((Suppl 1)):S127–33. Available from: <http://linkinghub.elsevier.com/retrieve/pii/S1995764514602182>.
- Ansari SH, Shamsi TS, Ashraf M, Bohray M, Farzana T, Khan MT, et al. Molecular epidemiology of β -thalassemia in Pakistan: far reaching implications. *Int J Mol Epidemiol Genet* 2011;2(4):403–8.
- Mansour AK, Aly RM, Abdelrazek SY, Elghannam DM, Abdelaziz SM, Shahine DA, et al. Prevalence of HBV and HCV infection among multi-transfused Egyptian thalassemic patients. *Hematol Oncol Stem Cell Ther* [Internet]. 2012 [cited 2018 Jan 3];5(1):54–9. Available from: <http://linkinghub.elsevier.com/retrieve/pii/S1658387612500063>
- El-Faramawy A, El-Rashidy O, Tawfik P, Hussein G. Transfusion transmitted hepatitis: Where do we stand now? A one center study in upper Egypt. *Hep Mon* 2012;12:286–91.
- Ataei B, Hashemipour M, Kassaian N, Hassannejad R, Nokhodian Z, Adibi P. Prevalence of anti HCV infection in patients with Beta-thalassemia in Isfahan-Iran. *Int J Prev Med* 2012;3:S118–23.
- Yousefi M, Dehesh M, Ebadi M, Dehghan A. The Prevalence of Hepatitis C Virus Infection in Patients With Thalassemia in Zabol City of Iran. *Int J Infect* 2017;4(1):e37009.
- Rezvan H, Abolghassemi H, Kafiabad S. Transfusion-transmitted infections among multi transfused patients in Iran: A review. *Transfus Med* 2007;17:425–33.
- Ansari SH, Shamsi TS, Khan MT, Perveen K, Farzana T, Erum S, et al. Seropositivity of Hepatitis C, Hepatitis B and HIV in Chronically Transfused $\beta\beta$ -Thalassaemia Major Patients. *J Coll Physicians Surg Pak* 2012;22(9):610–1.
- El-Beshlawy A, Youssry I. Prevention of Hemoglobinopathies in Egypt. *Hemoglobin* [Internet]. 2009 [cited 2018 Jan 3];33(sup1):S14–20. Available from: <http://www.tandfonline.com/doi/full/10.3109/03630260903346395>
- Brown RS, Gaglio PJ. Scope of worldwide hepatitis C problem. *Liver Transpl* [Internet]. 2003 [cited 2018 Jan 3];9(11):S10–3. Available from: <http://doi.wiley.com/10.1053/jlts.2003.50244>
- Alavian SM. Hepatitis C infection in Iran; A review article. *Iran J Clin Infect Dis* 2009;4(1):47–59.
- Alavian SM. Ministry of Health in Iran is serious about controlling hepatitis B. *Hepat Mon* 2007;7(1):3–5.
- Ramia S, Eid-Fares J. Distribution of hepatitis C virus genotypes in the Middle East. *Int J Infect Dis* 2006;10(4):272–7.
- Riaz H, Riaz T, Ullah F, Aziz S, Khan MU, Pervaiz R, et al. Assessment of the seroprevalence of viral hepatitis B, viral hepatitis C and HIV in multitransfused thalassaemia major patients in Karachi, Pakistan. *Trop Doct* 2011;41(1):23–5.
- Boroujerdnia MG, Zadegan MAA, Zandian KM, Rodan MH. Prevalence of hepatitis-C virus (HCV) among thalassemia patients in Khuzestan Province, Southwest Iran. *Pak J Med Sci* 2009;25(1):113–7.
- Atwa ZT, Abdel Wahed WY. Transfusion transmitted infections in frequently transfused thalassemic children living in Fayoum Governorate, Egypt: Current prevalence and risk factors. *J Infect Public Health* [Internet]. 2017 [cited 2018 Jan 3];10(6):870–4. Available from: <http://linkinghub.elsevier.com/retrieve/pii/S1876034117300904>
- Qurat-ul-Ain LA, Hassan M, Rana SM, Jabeen F. Prevalence of β -thalassemic patients associated with consanguinity and anti-HCV-antibody positivity—a cross sectional study. *Pak J Zool* 2011;43(1):29–36.
- Mollah AH, Nahar N, Siddique MA, Anwar KS, Hassan T, Azam MG. Common transfusion-transmitted infectious agents among thalassaemic children in Bangladesh. *J Health Popul Nutr* 2003;67–71.
- Mishra AK, Tiwari A. Iron overload in beta thalassaemia major and intermedia patients. *Maedica* 2013;8(4):328.
- Younus M, Hassan K, Ikram N, Naseem L, Zaheer HA, Khan MF. Hepatitis C virus seropositivity in repeatedly transfused thalassemia major patients. *Int J Pathol* 2004;2(1):20–3.
- Hussain H, Iqbal R, Khan MH, Iftikhar B, Aziz S, Burki FK, et al. Prevalence of hepatitis C in beta thalassaemia major. *Gomal J Med Sci* 2004;6(2).
- Shah S, Khan MT, Ullah Z. Hepatitis-B and Hepatitis-C virus infection in multi-transfused thalassemia Major patients. *Pak J Med Sci* 2005; 21(3):281.

Factors Predicting Poor Outcome in Gunshot Injuries to Brain

Muhammad Yousuf Shaikh, Muhammad Aamir Saghir, Salman Sharif and Samir Irfan

ABSTRACT

Objective: In view of the recent rise in the incidence of gunshot injuries, it is quite mandatory for scientific studies evaluating the prognostic factors contributing to the outcome of such patients. This study aims to identify such factors and evaluate them clinically

Study Design: Retrospective study

Place and Duration of Study: This study was conducted at the Department of Neurosurgery, Liaquat National Hospital & Medical College, Karachi from July 2012 to July 2017.

Materials and Methods: All patients that suffered gunshot injury from July 2012 to July 2017 were included in the study. Exclusion criteria included all patients that were brought dead or expired within two hours of surgery. Duration of stay, CT scan findings and GOS (Glasgow outcome score) were used to evaluate the prognosis of the patients. The prognostic factors evaluated in the study included age, sex, time of presentation and GCS on presentation.

Results: This study included a total sample size of 45 patients after inclusion and exclusion based on established criteria. The average age of the patients was 32 years. About 15% of them were female while 85 % were male. Majority of the patients presented more than 24 hours after the incident (71%). Overall mortality was 6 % (3 patients). On further analysis, higher GCS was associated with a better outcome (<0.05). Our study also showed that extensive brain injury was associated with a poor outcome with a statistically significant difference (<0.05)

Conclusion: Gunshot injuries to brain represent a high mortality and neurosurgical emergency. Admitting GCS and number of lobes involved were identified to be the most important predictors of poor outcome but if managed aggressively will have favorable outcomes.

Key Words: Firearm, head injuries, multilobar, Glasgow Outcome Scale

Citation of articles: Shaikh MY, Saghir MA, Sharif S, Irfan S. Factors Predicting Poor Outcome in Gunshot Injuries to Brain. Med Forum 2018;29(9):80-83.

INTRODUCTION

Gunshot injuries to brain are relatively rare but recently there has been a significant increase in the number of cases being reported. Overall, there has been a global increase in firearm injuries across America, Europe, UK and Asia¹. Firearm injuries to head are not only fatal but occasionally result in severe morbidity, both physical and psychological for the patient and family². Mortality rate of up to 88% has been reported in some studies and majority of them die in the first 48 hours^{3,4}. Since majority of the victims are male and bread earners of their families, the economy of the country suffers greatly. In 1996, World Health Organization declared Violence as one of the leading concerns of public health and proposed to take appropriate actions in order to prevent them⁵.

Pakistan is no different and suffers a similar fate. However, due to poor law and order situation and increasing crime rates, gunshot injuries to head are becoming increasingly common. One of the studies indicates that firearms are a common cause of violent deaths in young males of Pakistan with death rates estimated to be 4.22/100,000 per year⁶. Managing patients with Gunshot injuries to brain pose a treatment challenge. The extent of brain damage caused by a bullet is dependent upon the energy of the bullet. Since majority of civilian gunshot injuries are caused by low velocity bullets, less brain destruction is produced as a result. Therefore, using aggressive resuscitation measures, more lives can be saved and much of the neurological function preserved⁷. The objective of our study is to identify the prognostic factors that lead to poor outcome.

MATERIALS AND METHODS

This study was conducted at the Department of Neurosurgery, Liaquat National Hospital & Medical College, Karachi from July 2012 to July 2017.

Inclusion Criteria: All patients presenting with gunshot injuries to head in past 3 months

Exclusion Criteria: Patients who were brought dead. Patients who expired within 2 hours of presentation

Department of Neurosurgery, Liaquat National Hospital & Medical College, Karachi.

Correspondence: Dr. Muhammad Yousuf Shaikh, Department of Neurosurgery, Liaquat National Hospital & Medical College, Karachi.

Contact No: 0322-3302593, 0322-302593

Email: unknownyou@hotmail.com

Received: March, 2018;

Accepted: June, 2018

This retrospective study was conducted in Liaquat National Hospital, Karachi which is a level 2 Trauma centre. The hospital is situated in the middle of city which caters to the needs of many patients. It is a 750 bedded hospital with 50 ICU beds availability with ventilator support. The Emergency Department is well equipped with all life saving modalities and 3 ventilators. All gunshot patients are managed according to ATLS protocol and are responded by a Trauma team. All the patients who presented with Gunshot injuries to Head in Emergency and OPD from July 2012 to July 2017 were recruited in the study.

Information was gathered from the patient's case files which included the GCS at arrival, time of arrival since injury, surgery performed, CT scan findings and outcome with GCS on discharge and Glasgow outcome score (GOS) with 5 = good recovery, 4 = moderate disability, 3 = severe disability, 2 = persistent vegetative state and 1 = death. For statistical analysis, patients were categorized in to 2 groups; poor outcome (GOS 1-2) and satisfactory outcome (GOS 3-5). Similarly, based on admitting GCS, patients were classified into 4 groups; minimal or no neurological deficits (GCS 14-15), significant deficits without coma (GCS 9-13), comatose but not moribund (GCS 5-8) and moribund (GCS 3-4). Inclusion criteria were all patients who sustained gunshot injury to head in past 3 months. Exclusion criteria were patients who were brought dead or expired within 2 hours of injury. All the data was manually checked and entered to be analyzed using SPSS version 16. Pearson's Chi-squared test was used to analyze the relationship between GCS score on admission and GOS. The Ethical committee approval was taken prior to conducting the study.

RESULTS

A total of 45 patients fulfilled the inclusion criteria and were enrolled in the study. The demographics of the patients were as such that 7(15%) patients were female while the remaining 38 (85%) patients were male. Majority of the patients were aged between 20 to 40 years, the mean age being about 32 years. This included 37 patients representing (82%) of the study group. 4(8%) patients were aged below 20 and 4(8%) above 40 years.

Time of presentation after the incident was also recorded along with the presenting GCS. Out of the 45 patients, 13(29%) patients presented within 24 hours of the incident while remaining 32(71%) patients presented after a variable period of 1 - 90 days.

All such patients were managed according to ATLS protocol and trauma team was activated to resuscitate all patients. Once stable, CT scan was performed in all patients prior to planning any surgical intervention. Overall mortality was 3 (6%) while all the remaining 42(94%) patients survived.

35 (77%) patients underwent surgery, while the remaining 10 (23%) were managed conservatively. Of the 42 survivors at discharge, 25 (59%) had good recovery, 6 (14%) had moderate disability and 9 (21%) had severe disability. 2 (4%) patients were in persistent vegetative state.

Outcome Analyses: 24 patients with a GCS Score of 14-15 had satisfactory outcome while 1 patient had poor outcome. 11 patients with a GCS of 9-13 had satisfactory outcome while 1 had poor outcome. All 5 patients with GCS of 5-8 had satisfactory outcomes while all 3 Patients with GCS 3-4 had poor outcomes. Our statistical analysis reveals that a higher admitting GCS was associated with significantly higher number of satisfactory outcome. (Pearson's χ^2 test, P Value < 0.05).

Table No.1: GCS Scores and Outcome

GCS Score	Glasgow outcome score					Total
	Poor Outcome		Satisfactory outcome			
	1	2	3	4	5	
14-15	1		4	3	17	25
9-13		1	3	2	6	12
5-8			1	2	2	5
3-4	1	2				3
Total	2	3	8	7	25	45

Table No.2: CT findings and GOS

CT Scan findings	Glasgow outcome score					Total
	Poor outcome		Satisfactory outcome			
	1	2	3	4	5	
Limited injury	1	1	4	6	20	32
Extensive Injury	1	2	4	1	5	13
Total	2	3	8	7	25	45

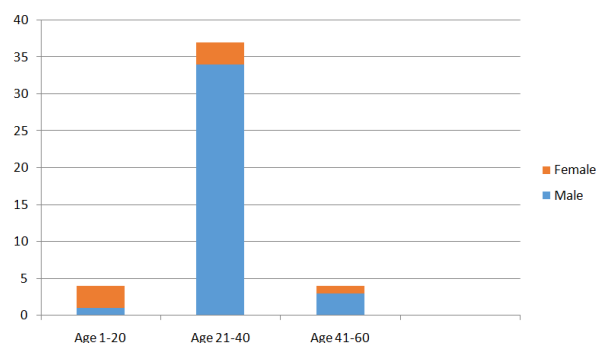


Figure No.1: Demographics of study group

CT scan was performed for all 45 patients which demonstrated 7 (15%) patients with bullet tract involving the scalp and soft tissue with no penetration of bone or Dura. 25 (55%) patients had involvement of one lobe while the remaining 13 (29%) patients had multilobar injuries. Patients with single lobe injuries and non penetrating dural injuries were included in the

limited brain injury group while the multilobar injuries were included in extensive brain injuries group. Of the 32 patients with limited brain injury, 30 (93%) had satisfactory outcomes while 2 (6%) patients had poor outcome. Among the 13 patients with extensive brain injury, 10 (77%) patients had satisfactory outcome while 2 (15%) had poor outcome and one patient (7%) expired. Statistical analysis revealed that there is correlation between extent of brain injury and outcome with extensive brain injuries having a higher chance of leading to a poor outcome. (Fisher's exact test, P value < 0.05)

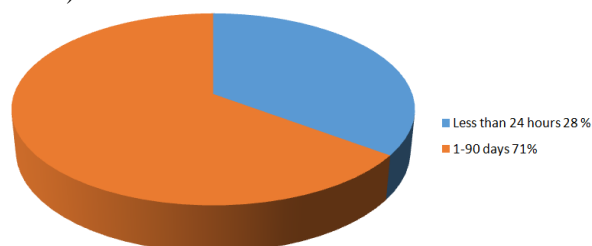


Figure No.2: Presentation times of patients

DISCUSSION

Firearm injuries are generally classified in to two groups, high velocity and low velocity with the demarcation of 600 meter/second between the two groups. Since majority of civilian firearm injuries are caused by low velocity projectiles, the extent of brain damage is relatively less compared to military weapons. Majority of deaths occur in the first 3 hours of injury⁹. Therefore all such injuries require aggressive management and resuscitation. Patients with stable vital signs and Pupil reactivity are potentially salvageable patients. These are the patients who will benefit greatly from immediate resuscitation and surgical intervention if warranted with the objective of preventing secondary brain injury. Bizhan Arabi et al reported a mortality rate of up to 91% in cerebral gunshot injuries⁹. They also reported as presenting GCS is the most important predictor of outcome. Another study conducted by Bellal Joseph et al reported a survival rate increment from 10% to 46% by adopting aggressive resuscitation measures¹⁰. However our study had dramatically better outcome and survival rates of up to 94%. This could be related to the fact that more than half of the patients in our study sample presented after 24 hours of injury and patients which expired within the first 2 hours or were brought dead on arrival were excluded from the study. These appear to be the two factors that show better survival rates in our study. It is also worth noticing that some of our patients 15 (33%) were from Afghanistan who had gunshot injuries to various parts of the body including brain and after surviving the initial injury, came to Pakistan for further management. These were mostly civilians who were shot during the ongoing war in their country. Majority of such patients had CSF leak

or abscess and required through wound debridement and duroplasty with antibiotics. The theory that the bullet injuries are sterile due to the heat of the bullet is completely false because the bullet draws in foreign material including clothing and hair in to the wound which acts as a foreign material triggering an inflammatory reaction. Since all cases of Dural penetration will lead to some CSF leakage, the risk of meningitis and cerebritis remains which emphasizes the importance of administering prophylactic antibiotics. In our setting, antibiotics were given to all patients considering the poor wound hygiene of patients and bullets being impacted in brain parenchyma. Carlos Mari et al reported that passage of bullet trajectory through sinuses and presence of metallic fragments are independent risk factors of causing infection¹¹. In our study, patients underwent surgery for the purpose of wound debridement, removal of space occupying hematoma or abscess, in driven accessible bone fragments and bullet. No attempt was made to retrieve all bone fragments or explore deep seated impacted bullets.

Another important observation from our study was that majority of the victims (82%) were aged between 20 to 40 with male predominance. This represents the working class of society; hence having these patients bed bound leads to significant loss of productivity and burden on a struggling economy.

CONCLUSION

Gunshot injuries to brain represent a high mortality neurosurgical emergency. Admitting GCS and number of lobes involved were identified to be the most important predictors of poor outcome. All patients particularly those with admitting GCS of more than 8 if managed aggressively have improved outcome, hence surgical treatment of all such injuries should never be delayed.

Acknowledgement: The authors of this study are thankful to administration of Liaquat National Hospital for permitting to perform this study.

Author's Contribution:

Concept & Design of Study:	Muhammad Yousuf Shaikh
Drafting:	Muhammad Aamir Saghir
Data Analysis:	Salman Sharif, Samir Irfan
Revisiting Critically:	Muhammad Yousuf Shaikh, Muhammad Aamir Saghir
Final Approval of version:	Muhammad Yousuf Shaikh

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Persad IJ, Reddy RS, Sunders MA, Patel J. Gunshot injuries to the extremities: experience of a UK trauma centre. *Injury* 2005;36:407–411.
2. Aldrich EF, Eisenberg HM, Saydjari C, et al.: Predictors of mortality in severely head-injured patients with civilian gunshot wounds: a report from the NIH Traumatic Coma Data Bank. *Surg Neurol* 1992, 38:418–423.
3. Hubschmann O, Shapiro K, Baden M, Shulman K. Craniocerebral gunshot injuries in civilian practice-prognostic criteria and surgical management: experience with 82 cases. *J Trauma* 1979;19:6–12.
4. Richardson JD, Davidson D, Miller FB. After the shooting stops: follow-up on victims of an assault rifle attack. *J Trauma* 1996;41(5):789–793
5. World Health Assembly. World Health Assembly resolution 49.25. Prevention of violence: a public health priority. Forty-ninth World Health Assembly. Geneva: WHO, 1996.
6. Hassan Q, Shah MM, Bashir MZ. Homicide in Abbottabad. *J Ayub Med Coll Abbottabad* 2005;17(1):78–80.
7. Helling TS, McNabney WK, Whittaker CK, Schultz CC, Watkins M. The role of early surgical intervention in civilian gunshot wounds to the head. *J Trauma* 1992; 32:398–400.
8. Levy ML, Masri LS, Lavine S, Apuzzo ML. Outcome of prediction after penetrating craniocerebral injury in a civilian population: aggressive surgical management in patients with admission Glasgow Coma Scale scores of 3, 4 or 5. *Neurosurg* 1994;35:77–85.
9. Aarabi B. Predictors of outcome in civilian gunshot wounds to the head Clinical article. *J Neurosurg* 2014;120(5): 1138–1146
10. Joseph B, Aziz H, Pandit V, et al. Improving Survival Rates after Civilian Gunshot Wounds to the Brain. *J Am Coll Surg* 2014;218(1):58–65
11. Jimenez CM, Polo J. Risk Factors for Intracranial Infection Secondary to Penetrating Craniocerebral Gunshot Wounds in Civilian Practice. *World Neurosurg* 2013;79(5-6):749–755

Role of Phloroglucinol in Reducing Duration of Active 1st Stage of Labour

Mahham Janjua¹, Rabia Wajid² and Aleena Sarwar¹

ABSTRACT

Objective: To make a comparison between the mean duration of active 1st stage of labour with phloroglucinol versus placebo.

Study Design: Randomized controlled trial study

Place and Duration of Study: This study was conducted at the Department of Gynae and Obs., Lady Aitcheson Hospital Lahore from 1st July 2017 to 31st December 2017.

Materials and Methods: A total of 60 cases with singleton pregnancy, in active 1st stage of uncomplicated labour and between 18 to 40 years of age were included. Patients with multiple pregnancy, history of obstetrical, surgical and medical complications were excluded. The patients fulfilling inclusion criteria were placed randomly into two groups i.e. Group A (phloroglucinol) and Group B (placebo), by using lottery method. After this, duration of the 1st stage of labour was noted in minutes.

Results: The mean age of patients in group A was 27.27±5.26 years and in group B was 26.87±5.44 years. The mean gestational age in group A was 38.37±1.40 weeks and in group B was 38.57±1.38 weeks. Mean duration of 1st stage of labour in Group A was 230.20 ± 52.96 minutes while in Group B was 345.30±50.57 minutes (p-value<0.0001).

Conclusion: It was inferred that phloroglucinol has an important role in making duration of active 1st stage of labour short.

Key Words: Antispasmodic, Labour, Acceleration, First stage

Citation of articles: Janjua M, Wajid R, Sarwar A. Role of Phloroglucinol in Reducing Duration of Active 1st Stage of Labour. Med Forum 2018;29(9):84-86.

INTRODUCTION

Labour is a process which involves contraction of myometrial muscles, effacement and dilatation of cervix and delivery of fetus and placenta in a stepwise fashion. The duration of first stage of labour in primigravida is around 12-16 hours and 6-8 hours in a multiparous female.¹ Prolonged labour results in adverse maternal and perinatal outcome due to maternal fatigue, excessive blood loss after delivery, infection and fetal distress and merits early detection and prompt action.^{2,3} The labour may get prolonged due to extremes of maternal age, induced labour, rupture of membranes before labour, early admission to the labour room, epidural analgesia and high levels of maternal stress hormones.⁴

Uterine contractions and cervical effacement make two essential components of labour. If effective contractions are there but if the cervix remains unresponsive, the labour will take a prolonged course.³

The idea of active management of labour was to ensure that the duration of labour would not be more than 12 hours. Although the new research is coming to the point that cervical dilatation could be slower than 1 cm/hour in young nulliparous female calling for re-evaluation of the current standards.⁵ The active management of labour is associated with lesser incidence of prolonged labour and a lower cesarean section rate.⁶

The diagnosis of dystocia requires a clear understanding of the fact when the progress is not within the normal range and requires intervention. Although methods to accelerate uterine contractions such as artificial rupture of membranes and oxytocics have been shown to improve cervical dilation, these methods have their own side effects.⁷ Drugs reducing spasm are given to improve dilatation of the cervix during delivery and reduce the first stage of labour.⁸ An ideal agent for reducing spasm and accelerating cervical dilation should have a quick and enduring action and with no risk of slowing down of uterine action. It should not have side effects for the mother and fetus.^{8,9} Phloroglucinol and drotaverine are in common use in labour room in many hospitals, to shorten first stage of labour.³ Study by Tabaco et al⁸ has shown that the mean duration of 1st stage of labour when phloroglucinol is used is 227.74±13.60 minutes as compared to 344.26±9.49 minutes in placebo group. As prolonged labour is associated with increased fetomaternal mortality and morbidity, this study will help us to determine the effect of phloroglucinol in

¹. Department of Gynae and Obs. Lady Aitcheson Hospital Lahore.

². Department of Gynae and Obs. Lady Willington Hospital, Lahore.

Correspondence: Mahham Janjua, Assistant Professor, Department of Gynae and Obs. Lady Aitcheson Hospital Lahore.

Contact No: 03335122297

Email: janjuamahham@gmail.com

reducing duration of active 1st stage of labour in our population. and if found effective, then its use could be encouraged in our routine practice to reduce the adverse consequences of prolonged labour for the mother and fetus.

MATERIALS AND METHODS

This randomized controlled trial study was carried out at Lady Aitcheson Hospital Lahore from 1st July 2017 to 31st December 2017. Total 60 cases with singleton pregnancy, in active 1st stage of uncomplicated labour at 37-41+6 weeks of gestation, 18-40 years of age were selected. Patients with multiple pregnancy, having obstetrical and surgical complications, cardiac failure, rhythm abnormality and asthma were excluded. Informed consent was taken. All patients were then randomized in double blind fashion in two groups. Each patient was made to pick up a slip from mixed up slips (half-slips contained letter 'A' and other half contained letter 'B') and she was placed in that respective group. Group A (study group) contained 30 cases who received phloroglucinol 40mg (4ml) I/V and Group B (control group) contained 30 cases who received placebo 4ml I/V at 0 hours. Dose was repeated after 30 minutes. Neither patient nor observer knew about the injection. After this, duration of the 1st stage of labour was noted in both groups. All the data was entered and analyzed by using SPSS version 20.0. Mean and standard deviation was calculated for age, gestational age and duration of 1st stage of labour. Frequency and percentage was calculated for parity.

RESULTS

Age range in this study was from 18 to 40 years with mean age of 27.07 ± 5.31 years. The mean age of patients in group A was 27.27 ± 5.26 years and in group B was 26.87 ± 5.44 years. Majority of the patients 37 (61.67%) were between 18 to 30 years of age (Table I).

Table No.1: Age distribution for both groups (n=60)

Age (years)	Group A (n=30)		Group B (n=30)	
	No.	%	No.	%
18-30	18	60.0	19	63.33
31-40	12	40.0	11	36.67
Mean \pm SD	27.27 ± 5.26		26.87 ± 5.44	

Table No.2: Distribution of patients according to parity in both groups

Parity	Group A (n=30)		Group B (n=30)	
	No.	%	No.	%
1	9	30.0	8	26.67
2	11	36.67	11	36.67
3	6	20.0	7	23.33
4	4	13.33	4	13.33

Mean gestational age was 38.47 ± 1.38 weeks in our study. The mean gestational age in group A was

38.37 ± 1.40 weeks and in group B was 38.57 ± 1.38 weeks. Majority of the patients 33 (55.0%) were between >38 to 40 weeks of gestation. Distribution of patients according to parity is shown in Table 2.

DISCUSSION

The effects of prolonged labour on fetomaternal health have been known since long. There are many risk factors which can predispose to it but are unknown in most cases.¹⁰ It has been seen that administering antispasmodics during labour could lead to quicker and efficacious cervical dilatation.¹¹ We have conducted this randomized controlled study to compare the mean duration of active 1st stage of labour with phloroglucinol versus placebo.

In our study, mean duration of 1st stage of labour in phloroglucinol group was 230.20 ± 52.96 minutes while in Group B, it was 345.30 ± 50.57 minutes making it statistically significant. A local study also demonstrated that the mean duration of 1st stage of labour by phloroglucinol was lesser as compared to placebo group.⁸ In another study by Rong-kai et al¹² the efficacy of phloroglucinol was proved.

In a study by Tahir and colleagues¹³, the mean duration of the first stage of labour in the control group was more as compared to the study group. In another study by Batool¹⁴ reported that phloroglucinol was compared with drotaverine and it was seen that there is 46.85 minutes (24.49%) reduction in first stage of labour in phloroglucinol group. Short duration of active phase of labour confers benefits on mother and fetus.

Hao et al¹⁵ in their study made a comparison between Phloroglucinol and Atropine. It was reported that the time period for full dilation of the cervix was lesser in those administered phloroglucinol. The disappearance ratio of cervical edema was quicker; the mean dilatation of cervix was more with very few side effects. Vaginal delivery rate was more. There was no statistical difference in the other parameters of fetomaternal outcome between the two groups. Another study concluded that both phloroglucinol and drotaverine are effective in enhancing the labour but duration of first stage of labour was lesser and cervical dilatation more in phloroglucinol group with no side effects. Few cesarean sections were required when phloroglucinol was used.¹⁴

Razia and colleagues¹⁶ demonstrated that the mean time for the active phase in spasfon group was significantly shorter than that in diazepam group and Anjum et al¹⁷ reported the same.

Parveen et al³ in his study concluded that the standard treatment alone compared to the augmentation with Phloroglucinol combined with standard treatment, the results were superior in a way that there was reduction in the duration of labour along with no maternal or neonatal side effects. The rate of operative delivery was less and lesser amount of oxytocic agents were used.

In a recent study done in Sub-Saharan Africa it was seen that phloroglucinol had a role in shortening active stage of labour by 2 hours. In another local study similar results were obtained, thus potentiating our claim.^{18, 19}

CONCLUSION

Phloroglucinol is effective in shortening the duration of active 1st stage of labour. So, we infer that its use could be incorporated in our routine practice for reducing duration of labour in patients having prolonged labour so that perinatal mortality and morbidity of both mother and fetus could be reduced.

Author's Contribution:

Concept & Design of Study: Mahham Janjua

Drafting:

Rabia Wajid

Data Analysis:

Aleena Sarwar

Revisiting Critically:

Mahham Janjua, Rabia Wajid

Final Approval of version: Mahham Janjua

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Naqvi SB, Haroon Z. Efficacy and safety of drotaverine and phloroglucinol in first stage of labour. *Pak J Surg* 2011; 27(1):39-43.
2. Dencker A, Berg M, Bergvist L, Ladfors L, Thorsen LS, Lilja H. Early versus delayed oxytocin augmentation in nulliparous women with prolonged labour: a randomized controlled trial. *Br J Obstet Gynecol* 2009; 116:530-6.
3. Parveen T, Hussain H, Khattak NN. Effects of phloroglucinol on augmentation of labour in primigravida. *J Med Sci* 2013; 21(3):131-3.
4. Akleh HE, Al-Jufairi ZA. Effect of hyoscine-N-bulyl bromide (Buscopan) in accelerating first stage of labor. *J Bahr Med Soc* 2010;22(3):103-7.
5. Oladap OT, Diaz V, Bonet M, Abalos E, Thwin SS, Souza H, et al. Cervical dilatation patterns of low risk women in spontaneous labour and normal perinatal outcomes: a systematic review. *BJOG* 2018;125(8): 944-54.
6. Guyatt G, Oxman AD, Akl EA, Kunz R, Vist G, Brozek J, et al. GRADE guidelines: 1. Introduction: Grade evidence profiles and summary of findings tables. *J Clin Epidemiol* 2011;64: 383-94.
7. Cohen WR, Friedman EA. Assessment of Labour : a brief history. *J Perinat Med* 2018; 46: 1-8.
8. Tabassum S, Afridi B, Aman Z. Phloroglucinol for acceleration of labour: Double blind, randomized controlled trial. *J Pak Med Assoc* 2005;55:270.
9. Cromi A, Ghezzi F, Agosti M, Uccella S, Piazza N, Serati M, et al. Use of an antispasmodic (Rociverine) to shorten the length of labor: a randomized, placebo-controlled trial. *Acta Obstet Gynecol Scand* 2011;90(12):1371-8.
10. Dansereau J, Joshi AK, Helewa ME, Doran TA, Lange IR, Luther ER, et al. Double-blind comparison of carbetocin versus oxytocin in prevention of uterine atony after cesarean section. *Am J Obstet Gynecol* 1999; 180(3 Pt 1):670-6.
11. Zhang J, Trundle JF, Yancey MK. Reassessing the labor curve in nulliparous women. *Am J Obstet Gynecol* 2002; 187(4):824-8.
12. Rong-kai X, Ya C, Xiang C, Zheng-qiong C, Xu-su Z. Effects of spasfon on promoting the labor progression. *Clin Mother Child Health* 2012; C120502.
13. Tahir S, Liaqat M, Jabeen S, Rasul S. Effectiveness of Phloroglucinol to accelerate labor in primigravidas at term: double blind, randomized controlled trial. *Pak J Med Health Sci* 2015; 9(1):169-72.
14. Ahmed S, Rauf B, Shafiq A. Use of spasfon in labour. *J Himont Med* 2002;1:14-8.
15. Hao Y, Zhai GR, Duan AH. Effects of Spasfon on course of labor. *Zhonghua Fu Chan Ke Za Zhi* 2004;39(9):606-8.
16. Razia R, Begum A, Bakhtiar U, Shaheen A, Ziaghham A, Saeed A. Phloroglucinol for acceleration of labour: double blind randomized controlled trial. *J Islamic Intl Med Coll* 2013;8(1):43-7.
17. Anjum N, Rehana M, Qazmi F. Efficacy of phloroglucinol versus placebo on the duration of labour in term pregnancies. *J Rawalpindi Med Coll* 2013;17(2):238-9.
18. Tchente CN, Nana TN, Tolefac PN, Abanda MH, Angong FTE, Tamambang RF, et al. Effects of Phloroglucinol on active phase of labour: A single blinded randomized trial in a tertiary care hospital in Sub Sahara Africa. *Pan Afr Med J* 2018;30:17
19. Hussain U. Effect of Phloroglucinol on active phase of first stage of labour. *J Fatima Jinnah Med Uni* 2011; 5(2):45-9.

Outcome of Fixation of Displaced and Unstable Tibial Shaft Fractures in Paediatric Age Group Patients by Using Titanium Flexible Intramedullary Nails

Zulfiqar Ahmed, Muhammad Nasir Ali and Zirwa Nasir

ABSTRACT

Objective: To evaluate the outcome of fixation of displaced and unstable tibial shaft fractures in paediatric age group patients by using Titanium flexible intramedullary nails.

Study Design: Prospective case series study

Place and Duration of Study: This study was conducted at the Orthopedic Complex, QAMC/B. V. Hospital, Bahawalpur from March, 2017 to June, 2018.

Materials and Methods: 34 patients (24 males 10 females), age range 06 to 16 years having severely displaced and unstable closed tibial shaft fractures were operated by using Titanium flexible intramedullary nails. Postoperative follow up evaluation was done for 06 months by using Flynn's criteria for TENS.

Results: Of the 34 patients operated all fractures healed satisfactorily at 10 weeks. Most common complaint was irritation at nail insertion site which was noted in 8 (23.5%) patients followed by nail protrusion in 7 (20.5%) patients while pain was reported by 3 (8.8%) patients. No patient developed superficial or deep infection. Overall functional outcome according to Flynn's criteria was excellent in 28(82.35%) patients, satisfactory in 04(11.76%) and poor in remaining 02(5.88%) patients.

Conclusion: The Titanium flexible nails are a good option for the treatment of displaced and unstable tibial shaft fractures in paediatric age group patients.

Key Words: Titanium elastic nails, Tibial shaft fractures in paediatric patients

Citation of articles: Ahmed Z, Ali MN, Nasir Z. Outcome of Fixation of Displaced and Unstable Tibial Shaft Fractures in Paediatric Age Group Patients by Using Titanium Flexible Intramedullary Nails. Med Forum 2018;29(9):87-90.

INTRODUCTION

The fractures of the tibia are among the common injuries in children and account for about ten to fifteen percent of the fractures in this age group¹. The diversity of the fracture types range from closed un-displaced to grossly displaced to open comminuted and contaminated injuries. Accordingly the closed un-displaced or minimally displaced reducible and stable tibial shaft fractures can be treated with six to eight weeks cast immobilization while the crushed, open and grossly contaminated fractures need external fixation for wound care and repeat surgical debridement procedures. Sometimes the stable reduction cannot be either obtained or maintained in case of closed fractures due to gross initial displacement or the oblique nature

of the fracture fragments and the plaster treatment fails. The available options for treatment in such situations include the percutaneous pinning, the external fixator application, intramedullary interlocking nail or plate and screws²⁻⁷. The percutaneous pinning gives weak fixation with risk of infection. External fixator also has the risks of pin site infection or re-fracture⁸⁻¹³. Intramedullary interlocking nails are also unsuitable for the paediatric age group due to open/active growth plates at the nail insertion sites¹⁴ while the plate and screws bear the risk of infection due to excessive soft tissue stripping.

During the last few decades the flexible intramedullary titanium nailing has gained the acceptance due to provision of low risks and more benefits (i.e., insertion without opening the fracture site, conservation of fracture hematoma and physeal plate) associated with this treatment modality¹⁵⁻¹⁷ as compared to most of the above mentioned options for the grossly displaced and irreducible or unstable transverse or short oblique fractures.

We conducted a prospective study and Flynn's criteria for TENS was used for the evaluation of the results of this technique.

Department of Orthopedic Complex, QAMC/Bahawal Victoria Hospital, Bahawalpur.

Correspondence: Dr. Zulfiqar Ahmed, Assistant Professor, Department of Orthopedic Complex, QAMC/Bahawal Victoria Hospital, Bahawalpur.

Contact No: 0300-9683382

Email: drzulfiqarahmednasir@gmail.com

Received: July, 2018;

Accepted: August, 2018

MATERIALS AND METHODS

This was a prospective case series study done at Orthopaedic Complex, Quaid-e-Azam medical college/ Bahawal Victoria Hospital, Bahawalpur from March 2017 to June 2018. 34 patients having closed transverse or short oblique tibial shaft fractures were included in the study. 24 were males and 10 were females. 20 patients were operated on right side and 14 were operated on left side (Table-1). Age range was 06 years to 16 years. All patients having severely displaced and unstable closed fracture with duration history of trauma of up to one week due to road traffic accidents or fall from height were included in the study. Patients with open fractures, pathological fractures or those having associated osteogenesis imperfecta or neuromuscular disorders were excluded from the study. Informed consent was obtained from the parents. All patients were operated under general anesthesia. The lower limb on the operation side was prepared and draped free. Sterilized tourniquet was applied to the upper thigh and inflated as required. Image intensifier was used to mark the proximal tibial physis, fracture and the proximal entry sites. About 2 cm longitudinal incision was made on lateral aspect of proximal tibial metaphyseal region just proximal to the entry site. 2 appropriate size titanium elastic nails with beveled tips were selected. The tips of the nails were bent to 45 degrees to ease the insertion and shafts of the nails were bent three times the diameter of the tibial shaft. Fluoroscopy was used to pass and guide the nail up to the fracture site. The second nail was prepared and entered in the same way from the other side of the proximal tibial metaphyseal region. The fracture was reduced and nails were passed one by one across the fracture site just proximal to the distal tibial physis. Fracture reduction was assessed in both anteroposterior and lateral planes. Proximal nail ends were bent and cut about one centimeter from the cortical surface for easy removal at appropriate time after fracture healing. Wounds were closed in layers and short leg plaster of Paris cast was applied. Stiches were removed at two weeks and further follow up done at six weeks (Fig.1), twelve weeks and six months for clinical and radiological evaluation. Clinical evaluation included subjective parameters like history of pain or irritation and objective parameters like examination of surgical incision site for wound status regarding superficial or deep infection or wound dehiscence, signs of irritation, swelling, redness, tenderness, nail protrusion, apparent alignment or rotational deformity of extremity across the fracture site, neurovascular status over ankle and foot and range of movements over knee, ankle and joints of foot while radiological evaluation parameters were based upon alignment of fracture fragments across the fracture site in both planes, limb length discrepancy, status of the hardware and fracture healing. Final follow up was

done at 6 months and results were evaluated by Flynn's criteria for TENs.

RESULTS

All 34 patients included in the study were followed up for period of six months. Subjective, objective and radiological parameters were assessed at follow up visits at two weeks, six weeks, twelve weeks and six months. Pain was reported by 03(8.8%) patients while the most common complaint was irritation at the nail insertion site which was reported by 08(23.5%) patients. No patient showed the signs of superficial or deep infection or wound dehiscence. Nail protrusion was the second most common complaint which was noted in 07(20.5%) patients. External rotation deformity of less than five degree examined by thigh foot angle comparison with normal side was noted in 02(5.8%) patients. No patient developed sensory or motor deficit.



Figure No.1: Fractures

Table No.1: Demographic Data

Total Number of Patients	34
Male	24
Female	10
Right Sided Injury	20
Left Sided Injury	14

Table No.2: Subjective & Objective Parameters

Total Number of Patients	34
Pain complaint	03
Irritation at nail insertion site	08
Nail Protrusion	07 (60%)
Rotational deformity (External rotational deformity)	02 (5.8%)
Range of Movements at knee and ankle	Full

All patients had full range of movements over the operated side knee and ankle joints (Table-2). Alignment deformity of less than five degrees was found in 28(82.3%) patients, that of five to ten degrees in 04(11.7%) patients and more than ten degrees in only 02(5.8%) patients. Limb length discrepancy or

hardware breakage was not noted in any patient during or till the end of six months follow up.

Table No.3: Radiological Parameters

Total Number of Patients	34
Alignment Deformity	
Less than five degrees	28
Five to ten degrees	04
More than ten degrees	02
Limb length discrepancy	00
Hardware breakage	00
Fracture Healing at 06 months follow up	34

Table No.4: Overall Results (According to Flynn's Criteria)

Total Number of Patients	34
Excellent	28 (82.35%)
Satisfactory	04 (11.7%)
Poor	02 (5.8%)

All the patients had signs of radiological fracture healing at ten weeks (Table-3). At final follow up at six months the patients were assessed according to Flynn's criteria for TENs and 28(82.35%) patients had excellent, 04(11.7%) patients showed satisfactory results while poor results were noted in 02(5.8%) patients (Table-4).

DISCUSSION

Most of the closed tibial shaft fractures in paediatric age group can be treated by manipulation and reduction followed by casting but sometimes the reduction cannot be either achieved or maintained due to gross initial displacement. In these situations some type of fixation becomes necessary. Historically the available surgical options include percutaneous pin fixation, external fixation, plate and screw fixation and reamed intramedullary nails. All these techniques have their relevant demerits regarding their usage in paediatric tibial shaft fractures. The percutaneous pin fixation and external fixation are associated with risks of non-union, refracture^{18,19,20} or high rate (up to 50%) of pin site infection^{21, 22, 23}. Although plate and screw application provide rigid fixation but this technique is also associated with extensive soft tissue stripping risks of non-union and infection^{24(Ref.---)ARTICLE}². Reamed intramedullary nailing although preferred for long bone shaft fractures in adults, is not suitable for children due to the risk of proximal tibial physeal damage. Titanium elastic intramedullary nails were introduced in Europe and North America during last few decades for the treatment of long bone shaft fractures with reports of good results due to the associated benefits of intramedullary device and prevention of the injury to the growth plates because of entry sites away from the growth plates.

O'brien²⁵ et al in their study of this technique in sixteen patients reported good results with superficial infection in one patient and sagittal and coronal mal-alignments in seven and six patients respectively while only one child had the shortening of leg length >1.5 centimeters. Vallamshetla et al²⁶ presented the results of fifty six fractures in fifty four patients. According to their study two patients had difference of leg length less than two centimeters, development of deep infection in two patients and mal-alignment in other two patients.

Ahmed et al²⁷ presented results of their study in twenty patients based on Flynn's criteria. They reported excellent results in fifteen cases while satisfactory outcome was noted in five cases.

In our study we noted irritation at nail insertion site in 08(23.5%) cases and nail protrusion in 07(20.5%) cases, alignment deformity of less than five degree in 28(82.3%) patients, five to ten degrees in 04(11.7%) patients while significant alignment deformity of more than 10 degrees in 02(5.8%) patients. Overall success rate with excellent results was in 28(82.35%) patients, satisfactory in 04(11.7%) cases while poor in 02(5.8%) cases, which is comparable to most of the studies available in literature. Limitations of our study are that this was carried out in closed transverse and short oblique tibial shaft fractures. However further studies are required for evaluation of the results of this technique in other categories like open fractures, comminuted, long oblique or those present in proximal or distal metaphyseal regions.

CONCLUSION

After evaluation of the results we concluded that this technique is very useful option for the treatment of closed transverse and short oblique tibial shaft fractures in paediatric age group due to its benefits of preservation of fracture hematoma, growth plates and very low risk of post-operative infection.

Author's Contribution:

Concept & Design of Study:	Zulfiqar Ahmed
Drafting:	Muhammad Nasir Ali
Data Analysis:	Zirwa Nasir
Revisiting Critically:	Zulfiqar Ahmed, Muhammad Nasir Ali
Final Approval of version:	Zulfiqar Ahmed

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Santili C, Gomes C, Waisberg G, Braga S, Lino JW, Santos FG. Tibial diaphyseal fractures in children. Acta Ortop Bras 2010;18: 44-48.
2. Alonso JE, Horowitz M. Use of the AO/ASIF external fixator in children. J Pediatr Orthop 1987;7:594-600.

3. Behrens F, Searls K. External fixation of the tibia. Basic concepts and prospective evaluation. *J Bone Joint Surg Br* 1986;68:246–54.
4. Shannak AO. Tibial fracture in children: follow-up study. *J Pediatr Orthop* 1988;8:306–10.
5. Hansen BA, Greiff J, Bergmann F. Fractures of the tibia in children. *Acta Orthop Scand* 1976;47: 448–53.
6. Mark GS, Rajan RA. Elastic intramedullary nailing in unstable fractures of the paediatric tibial diaphysis: a systematic review. *J Child Orthop* 2010;4:45–51.
7. Masquijo JJ. Percutaneous plating of distal tibial fractures in children and adolescents. *J Pediatr Orthop B* 2014;23:207–11.
8. Siegmeth A, Wruhs O, Vecsei V (1998) External fixation of lower limb fractures in children. *Eur J Pediatr Surg* 8:35–41.
9. Tolo VT. External skeletal fixation in children's fractures. *J Pediatr Orthop* 1983;3:435–442.
10. Bar-On E, Sagiv S, Porat S. External fixation or flexible intramedullary nailing for femoral shaft fractures in children. *J Bone Joint Surg Br* 1997; 79:975–978.
11. Zelle BA, Bhandari M, Espiritu M, et al. Treatment of distal tibia fractures without articular involvement: a systematic review of 1125 fractures. *J Orthop Trauma* 2006;20:76–9.
12. Tolo VT. External skeletal fixation in children's fractures. *J Pediatr Orthop* 1983;3:435–42.
13. Evanoff M, Strong ML, MacIntosh R. External fixation maintained until fracture consolidation in the skeletally immature. *J Pediatr Orthop* 1993;13: 98–101.
14. Sankar WN, Jones KJ, Horn BD, et al. *J Child Orthop* 2007;1:281–286.
15. Carey TP, Galpin RD. Flexible intramedullary nail fixation of pediatric femoral fractures. *Clin Orthop* 1996;332:110–118.
16. Flynn JM, Hresko T, Reynolds RA, Blasier RD, Davidson R, Kasser J. Titanium elastic nails for pediatric femur fractures— a multicenter study of early results with analysis of complications. *J Pediatr Orthop* 2001;21(1):4–8.
17. Metaizeau J. Stable elastic intramedullary nailing of fractures of the femur in children. *J Bone Joint Surg Br* 2004;86:954–957.
18. Siegmeth A, Wruhs O, Vecsei V. External fixation of lower limb fractures in children. *Eur J Pediatr Surg* 1998;8:35–41.
19. Tolo VT. External skeletal fixation in children's fractures. *J Pediatr Orthop* 1983;3:435–442.
20. Bar-On E, Sagiv S, Porat S. External fixation or flexible intramedullary nailing for femoral shaft fractures in children. *J Bone Joint Surg Br* 1997;79:975–978.
21. Zelle BA, Bhandari M, Espiritu M, et al. Treatment of distal tibia fractures without articular involvement: a systematic review of 1125 fractures. *J Orthop Trauma* 2006;20:76–9.
22. Tolo VT. External skeletal fixation in children's fractures. *J Pediatr Orthop* 1983;3:435–42.
23. Evanoff M, Strong ML, MacIntosh R. External fixation maintained until fracture consolidation in the skeletally immature. *J Pediatr Orthop* 1993; 13:98–101.
24. Shen K, Cai H, Wang Z. *Medicine* 2016;95:39.
25. O'Brien T, Weisman DS, Ronchetti P, Piller CP, Maloney M. Flexible titanium nailing for the treatment of the unstable paediatric tibial fracture. *J Pediatr Orthop* 2004; 24: 601–609.
26. Vallamshetla P, De Silva U, Bache CE, Gibbons PJ. Flexible intramedullary nails for unstable fractures of the tibia in children. An eight-year experience. *J Bone Joint Surg Br* 2006;88:536–540.
27. Ahmed E K.F, Zakaria B, Hadhood M, Shaheen A. Management of diaphyseal tibial fracture in pediatric by elastic stable intramedullary nails. *Menoufia Med J* 2014; 27: 401–406.

Guidelines & Instructions**Guidelines and Instructions to Authors**

The Journal MEDICAL FORUM agrees to accept manuscripts prepared in accordance with the Uniform Requirements submitted to the Biomedical Journals published in the British Medical Journal 1991;302:334-41. Revised in February 2006.

Medical forum is a Peer Reviewed Journal of all Specialities. Recognized by PMDC, HEC and Indexed by WHO, EXCERPTA MEDICA, SCOPUS Database, Pakmedinet, National Library of Pakistan, Medlip of CPSP and registered with International serials data system of France.

Requirement for Submission of Manuscripts

The material submitted for publication may be Original research, Review article, Evidence based reports, Special article, Commentary, Short Communication, Case report, Recent advances, New technique, View points on Clinical/Medical education, Adverse drug reports, Letter to Editor and Guest Editorials.

- 1) 3 Hard copies of Laser Print.
- 2) 1 Soft copy on a CD.
- 3) Letter of Undertaking in which Authors Name, Address, Mobile no, Degrees, Designations, Department of Posting and Name of Institution.
- 4) All Manuscript typed in MS Word and Figures, Graphs and Charts in Corel, JPG or BMP.

The manuscript should be typed in double spacing. Begin each section or component on a new page. Review the sequence: Title Page, Abstract, Key Words, Text, Acknowledgement, References, Tables (each on separate page). Illustrations, Uncounted prints, should not be larger than 8 x 10 inches.

ORIGINAL ARTICLE

Original Article should be of 2000 Words and not more than 3000 Words, not more than 6 Tables or Figures and at least 20 References but not more than 40.

REVIEW ARTICLE

Review Article should be of 3000 Words with at least 40 References but not more than 60.

SHORT COMMUNICATIONS OR CASE REPORTS

It should be 600 Words with one Table or Figure and 5 References.

LETTER TO EDITOR

It should be 400 Words with 5 References.

TITLE OF THE ARTICLE

It should be Accurate, Effective and Represent the main message of Article.

ABSTRACT

In Original Article, It should consist of the following subheadings: Objective, Design, Place & Duration, Materials & Methods, Results, Discussion, Conclusion & Key Words. In Original Article, the abstract should not more than 250 Words.

Review Article, Case Report and other require a short unstructured abstract. Short Communications & Commentaries do not require abstract.

INTRODUCTION

The start of the introduction should be Relevant. Reasons and Importance of the study should be clear. In the subject of the paper Significant findings may be elaborated. Previous 10 years National & International literature may be reviewed and recorded in the introduction. State the purpose of the Article and summarize the rationale for the study or observation. Give only strictly pertinent References and do not include data or conclusions from the work being reported.

MATERIALS & METHODS

The Population taken for the study should be uniform and Sample selection criteria should be reliable. Inclusion & Exclusion criteria should be clearly specified. Control within the study or literature may be given. Important variable measurement criteria should be mentioned. Investigation, Procedure & Technique should be clearly described.

RESULTS

Present yours results in a logical sequence in the Text, Tables, Illustrations. Do not repeat in the text all the data in the tables or illustrations. Emphasize or Summarize only important observations. Do not duplicate data in Graphs & Tables.

DISCUSSION

Emphasize the new and important aspects of the study and conclusions that follow from them. Do not repeat in detail data or other material given in the Introduction or Results Section. Include in the Discussion Section the implications of the findings and their limitations, including implications for future research. Relate the observations to other relevant studies.

CONCLUSION

In this link write the goals of the study but avoid unqualified statements and conclusions not completely supported by data.

RECOMMENDATIONS

When appropriate, may be included.

ACKNOWLEDGMENTS

List of all contributors who do not meet the criteria for Authorship, such as a person who provided purely technical help, writing assistance or department chair who provided only general support. Financial & Material support should be acknowledged.

REFERENCES

It should be in the **Vancouver style**. References should be numbered in the order in which they are cited in the text. At the end of the article, the full list of references should give the names and initials of all the authors. **(if the authors are more than 6, then et al should be followed after the 6th name)**. The author (s) names are followed by the title of the article; title of the journal abbreviated according to the style of the Index Medicus (see "List of Journals Indexed." Printed yearly in the January issue of Index Medicus); year volume and page

COPYRIGHT

Material printed in this journal is the copyright of the journal "MEDICAL FORUM" and can not be reproduced without the permission of the editors or publishers. Instructions to authors appear on the last page of each issue. Prospective authors should consult them before sending their articles and other material for publication with the understanding that except for abstract, no part of the data has been published or will be submitted for publication elsewhere before appearing in this journal.

The Editorial Board makes every effort to ensure the accuracy and authenticity of material printed in the journal. However, conclusions and statements expressed are views of the authors and do not necessarily reflect the opinions of the Editorial Board or the journal "MEDICAL FORUM". Publishing of advertising material does not imply an endorsement by the journal "MEDICAL FORUM"

number; e.g: Hall RR. The healing of tissues by CO₂ laser. Br J Surg: 1971;58:222-5. (Vancouver Style).

Note to the Authors Before Submitting of Manuscript

a) Redundant or Duplicate Publications.

Redundant or Duplicate Publications are publications which overlap substantially with one already published. If such publication is attempted without proper notification, author should expect editorial action to be taken. At the very least, prompt rejection of the manuscript will occur.

b) Acceptable Secondary Publication.

Secondary publication in the same or another language, especially in other countries, is justifiable and can be beneficial, provided all our conditions are met.

c) Protection of Patient's Rights to Privacy.

Patients have a right to privacy, which is not to be infringed. Proper informed consent should be attained from all patients in a study.

Note regarding Peer Review Policy

Every article will be read by the Editorial Staff & Board first. After this every article will be sent to one or more external reviewers. If statistical analysis is included further examination by a statistician will be carried out.

Azhar Masud Bhatti,
Editor in Chief

ADDRESS FOR SUBMISSION OF ARTICLES:

66-R, Phase-VIII, Defence Housing Authority, Lahore.
Mob. 0331-6361436, 0300-4879016, 0345-4221303, 0345-4221323
E-mail. med_forum@hotmail.com,
medicalforum@gmail.com
Website: www.medforum.pk

