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Editorial

Diabetes and Unhealthy Life Style

Mohsin Masud Jan

Editor

Diabetes is on the rise as there are 422 million diabetes in the world and almost 16 percent population of Pakistan is living with the disease. The people can ward off diabetes by adopting healthy lifestyle through use of balanced diet and regular exercise.

Giving up the habit of junk food and cold drinks, eating fresh fruits and vegetables in daily diet and doing regular walk or exercise daily will help to prevent diabetes. Proper care and preventive measures can control diabetes in an effective manner.

We have become lethargic and sedentary, which tantamount to inviting various diseases. Use of fresh fruits, vegetables and regular exercise would help in preventing diabetes.

Diabetes affected all organs of body, therefore, it was necessary to consciously fight against this disease. Diabetes had become a common disease as it could be inherited as well. It is in our hands to prevent the disease before happening and control the disease after happening. The balanced diet, including fresh fruits and vegetables and 35 to 40 minutes of walk play key role to keep diabetes away. If preventive measures are not adopted then diabetes can be dangerous and can invite more diseases to the patients.

There is a need to spread awareness and remove misconceptions among the people. Some diseases like diabetes and blood pressure can neither be diagnosed earlier nor completely cured, therefore, proper care and prevention help in keeping the diseases away. Diabetes and blood pressure required lifetime treatment. The diabetes had to take medicines for life, therefore, it was advisable to prevent and avoid this disease. If a patient adopts carelessness then serious complications can affect the patient. Diabetes was a genetic disease and could be inherited by the children from their diabetic parents. Major risk factors for type 2 diabetes include obesity and a sedentary lifestyle. The diabetes patients and their families need counseling to deal with the disease.

25 percent of all patients in hospitals were suffering from various complications of diabetes. The use of insulin and medicines among diabetes should be fourth

on priority list. The diabetics should adopt healthy lifestyle, our balanced diet, do regular exercise and spend tension free life. There were around 422 million patients of diabetes in the world and it is also spreading at a fast pace in Pakistan as almost 10 percent of the population was suffering from this disease.

According to estimates, diabetes with this pace will affect every 10th person by the year 2040. It was paramount to create awareness among the people to prevent diseases. According to a 2013 survey, 400 million people were suffering from diabetes, which may potentially affect up to 600 million people by the year 2035.

Treatment of diabetes was not all about insulin and medicines to keep blood sugar in normal range, but it was also about keeping blood pressure and cholesterol within their natural limits. The treatment of diabetes consists of four ingredients of healthy diet, exercise, sugar monitoring and medicines.

There were two types of diabetes i.e. type-I and type-II, adding that type-I diabetes emerges in childhood that destroys the insulin producing cells, whereas type-II diabetes reduces the production of insulin in the body. Almost 90 percent of patients are suffering from type-II diabetes.

It was extremely important to control diabetes among pregnant women to prevent diabetes in the newborn.

The symptoms of diabetes include frequent thirst, numbness in hands and feet, delay in healing of wounds, burning of feet, needle-like pinching in the body, excessive urination and rapid weight loss.

People are advised to adopt preventive measures to avoid diabetes through healthy lifestyle. We need to protect our new generations from this disease. People are further advised to avoid oily and fast foods, cold drinks, sweets etc. and do regular physical exercise to avoid sugar.

Early diagnosis of diseases, including diabetes was a key towards control, treatment and cure of the diseases. The diabetes was fast spreading among people not only in Pakistan but around the world.

Down Staging of Cirrhosis in All Cirrhotic Patients with HCV Genotype 3-a Infection, Treated with 12-Weeks Triple Therapy, Including Sofosbuvir, Daclatasvir and Ribavirin

Abid Shah, Nizamuddin, Naimat Ullah Khan and Waheed Iqbal

ABSTRACT

Objective: This study was mainly conducted to assess the improvement in the stages of cirrhosis in all treated patients with HCV genotype 3a infection, treated with triple therapy including daclatasvir, sofosbuvir and ribavirin in population of Khyber Pakhtunkhwa.

Study Design: Prospective longitudinal study.

Place and Duration of Study: This study was conducted at the Department of Pharmacology, Khyber Medical College and Khyber Teaching Hospital Peshawar from May 2017 to October 2017.

Materials and Methods: Total of 75 cirrhotic patients with HCV genotype-3a infection, were enrolled and were assigned into 02 groups including group-I as those having Child Pugh Turcott stage-C cirrhosis and group-II as those having Child Pugh Turcott stage-B cirrhosis. Daclatasvir, Sofosbuvir and ribavirin was given for 12-weeks. Child Pugh Turcotte (CPT) staging was done before and after the completion of 12-weeks treatment. The primary end point was end of treatment (EOT-12) response with 12-weeks therapy, which is defined as HCV RNA level <40IU/ml after 12-weeks of therapy and improvement in the stages of cirrhosis.

Results: Out of total 75 liver cirrhotic genotype 3a infected patients 44 (58.7%) were males while 31 (41.3%) were females. Their mean age is 50.95 ± 8.58 years. According to the CPT staging criteria, 40 (53.3%) patients with stage-C (group-I) while 35 (46.7%) patients with stage-B (group-II). At the end of therapy, 15% and 62.5% of the patient in group-I were down staged from C to A and C to B respectively. Similarly, in group-II, 57.1% of total patients were down staged from stage-B to stage-A.

Conclusion: Triple therapy including Daclatasvir, Sofosbuvir and ribavirin is not only effective in all cirrhotic patients with chronic hepatitis-C genotype-3a infections, but also improve the clinical parameters and stages of cirrhosis.

Key Words: Chronic hepatitis C, non-cirrhotic, Cirrhotic, triple therapy, down staging of cirrhosis.

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INTRODUCTION

Hepatitis-C is a chronic disease, which affects human in all seven continents of the worlds. Decompensated cirrhosis is a life-threatening complication of HCV infection, with 5-years survival in only 50% cases¹. HCV is considered as one of the leading cause of post transfusion non-A and non-B hepatitis^{2,3} and one of the most important causes of Chronic Liver disease. Hepatitis C is one of the most dangerous and rapidly increasing public health problem.

This is one the most common cause of Liver Cirrhosis and Hepatoma and ultimately one of the common indications for liver transplantation. According to WHO, the global prevalence of CHC >3%, which affect almost 170 to 200 million people worldwide⁴. Along with hepatitis-B, it shares >75% cases of all chronic liver disease (CLD) worldwide⁵. Almost every patient, if not treated timely can develops Cirrhosis, which may lead into hepatocellular carcinoma and finally death. Chances of Cirrhosis and death usually increase with the severity of Cirrhosis.

There are many guidelines and scoring system to document the level of cirrhosis. These scoring systems basically categorize the level of cirrhosis and prognosis of individual patient⁶. One of the most important scoring systems is Child Pugh Turcotte (CPT) staging. It's have got five parameters, each having 3-points, which are based on its severity where 1 point means least severe while 3 as more severe. It is shown in the following table No 1.

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This scoring system is used along with other scoring system like MELD etc. around the world to assess the severity of cirrhosis and possible future prognosis of that patient. It is also used for future treatment planning for that particular patient. Based on this scoring, cirrhosis can be staged into three stages, including stage A as less severe and Stage C as more severe cirrhosis. This is showing along with the possible one year and two years prognosis in the following table No 2.

In last decade, HCV remains the focus of research and new drugs, which are acting as direct antiviral drugs, are introduced. Previously, pegylated interferon was used along with Ribavirin. This treatment was only recommended in non-cirrhotic patients but the introduction of new DAAs (Direct Acting Anti-viral) have alter the therapy dramatically in both cirrhotic and non-cirrhotic patients. These can be safely used in both cirrhotic and non-cirrhotic patients. Some of them are specific to a single genotype, but other has pan genotyping activity and can be used in all genotype in different combination. The most recommended therapy for HCV genotype 3a infection by AASLD and EASL guidelines includes Sofosbuvir, Daclatasvir and Ribavirin. Sofosbuvir is NS5B HCV RNA dependent RNA polymerase inhibitor, and is one of the most combating drug against hepatitis C virus while Daclatasvir is a NS5A inhibitor. Sofosbuvir in a dose of 300mg OD and Daclatasvir in a dose of 60mg OD along with weight-based Ribavirin can be given for 12 weeks in all HCV genotype 3 infection including both cirrhotic and non-cirrhotic⁷.

Liver cirrhosis and hepatocellular carcinoma (HCC) are the major complications of HCV and are the major cause of deaths in patients with Hepatitis-C infection. Therefore, all these patients must be treated aggressively to completely eradicate virus from the serum, and to improve the different parameters, which show the severity of cirrhosis and risk of HCC. By eradicating virus and improve the level of cirrhosis, HCC and risk of death can be decreased.

Many studies are published worldwide recording the efficacy of these drugs. But we have conducted this unique study in order to assess the level of HCV related cirrhosis improvement with this treatment combination in Pakistani community.

MATERIALS AND METHODS

This single centered prospective study was carried out in Khyber Teaching Hospital Peshawar Pakistan. The duration of the study was 6 months starting from May 2017 to OCT 2017 in which total 75 liver cirrhotic genotype 3a infected patients who responded to the therapy were included in the study after both ethical approval and informed consent from patients. They were divided in to two groups, group-I and group-II, based on their liver cirrhosis according to the Child Pugh Turcotte Staging. The group-I includes 40 stage C

patients while the group-II includes 35 stage B patients. The demographics were obtained on structural proforma. All these patients were treated with oral antiviral drugs including sofosbuvir, Daclatasvir and Ribavirin for a period of 12 weeks. After the completion of therapy, the CPT Staging was repeated and the results were recorded.

Statistical analysis: All the data were entered in the excel sheet. The frequencies and percentages for both group-I and group-II were calculated. Difference of patients in group I that were reverted from liver cirrhosis stage C to A and C to B were calculated using SPSS version 16.0. Similar analysis was performed for group II using SPSS version 16.0 and the data were presented in tables. Similarly, the graph was constructed using Microsoft Excel 2013.

RESULTS

Out of total 75 liver cirrhotic genotype 3a infected patients 44 (58.7%) were males while 31 (41.3%) were females. Their mean age is 50.95 ± 8.58 years. All the data is summarized in table 3.

According to the Child Pugh Turcotte Staging criteria, 40 (53.3%) patients with stage C were grouped in group-I while 35 (46.7%) patients with stage B were placed in group-II as shown in table 4.

Table No.1: CPT Scoring

Measure	1-Point	2-points	3-Points
Total Bilirubin (mg/dl)	2	2-3	>3
Serum Albumin (g/dl)	>3.5	2.8-3.5	<2.8
Prothrombine Time (seconds Prolongation)	<4	4-6	>6
Ascites	None	Mild	Moderate to Severe
Hepatic Encephalopathy	None	Grade 1-2	Grade 3-4

Table No. 2: Liver Cirrhosis staging

Points	Class	One-year Survival	Two-year Survival
5-6	A	100%	85%
7-9	B	81%	57%
10-15	C	45%	35%

Table No.3: Demographics of study population

		Frequency	Mean	SD
Age		75	50.95	8.58
Gender	Males	44 (58.7%)	-	-
	Females	31 (41.3%)	-	-
Total		75	-	-

All the patients were given triple oral therapy including sofosbuvir, Daclatasvir and Ribavirin for 12 weeks and at the end of therapy, 15% and 62.5% of the patient in group I were down staged from C to A and C to B

respectively. Similarly, in group II, 57.1% of total patients were down staged from stage B to stage A as shown in table 5 and their difference is graphically shown in figure 1.

Table No.4: Child Pugh Turcotte Staging before therapy

Stage	Frequency	Percent
A	0	0
B	35	46.7%
C	40	53.3%
Total	75	100%

Table No.5. Child Pugh Turcot Staging after therapy

Stage	Frequency	Percent	Group I		Group II
			Conversion from C to A	Conversion from C to B	Conversion from B to A
A	26	34.7%	06 (15%)	25 (62.5%)	20 (57.1%)
B	40	53.3%			
C	09	12.0%			
Total	75	100%			

Downstaging of liver cirrhosis between groups

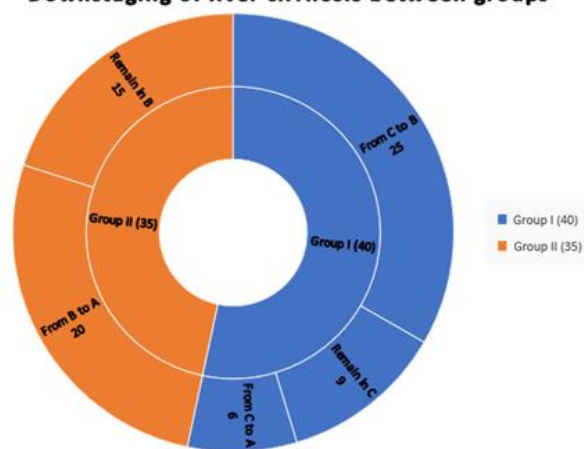


Figure No.1: Down staging of liver cirrhosis in group I and group II

DISCUSSION

The paradigm shift in the treatment combination from interferon-based therapy to direct acting anti-viral therapy has totally changed the direction of research in chronic hepatitis-C. Around the globe in the specialty of hepatology, hepatitis-C remains the main target of research. The new drugs, which are acting as direct Antiviral drugs (DAAs) have really revolutionized the treatment strategy in all HCV genotypes. Previously, only patient with healthy liver were treated with interferon but now one can give these drugs even in

case of advanced cirrhosis⁸. In recent guidelines, adopted by AASLD (American Association for the Study of Liver Diseases), IDSA (Infectious Diseases Society of America)⁹ and EASL (European Association for the Study of Liver)^{7,10}, Daclatasvir, sofosbuvir plus ribavirin can be given for 12 weeks for the optimal treatment of all Chronic HCV genotype-3 infection, including both cirrhotic and non-cirrhotic cases.

In our present study, all the patients were given triple oral therapy including sofosbuvir, Daclatasvir and Ribavirin for 12 weeks. At the end of therapy, 100%(n=75/75) response rate has been observed with triple therapy in both CPT stage-B and CPT stage-C cirrhotic cases with HCV-genotype-3a infection. The main target of our study was to analyze the improvement in the clinical parameters and stages of cirrhosis. In group-I with CPT stage-C cirrhosis, 15% and 62.5% of the patient were down staged from C to A and C to B respectively. Similarly, in group-II with CPT stage-B cirrhosis, 57.1% of total patients were down staged from stage-B to stage-A.

The finding of our study is closed to the finding of another study, conducted in Europe by Deterding K. et al. In that study, liver function parameters including albumin, bilirubin, cholinesterase and prothrombin time all improved in the majority of patients during antiviral therapy irrespective of the underlying HCV genotype, however, with different kinetics. They used MELD scores instead of CPT score, which get improved by 44% of the patients¹¹.

This combination is not only effective but also absolutely safe in advanced cirrhosis. This association was confirmed by another study conducted by Poordad F. et al. In this study, "12 weeks of treatment with the pan-genotypic combination of daclatasvir with sofosbuvir and ribavirin achieved SVR12 rates of 83% and 94% in the advanced cirrhosis and post transplantation cohorts, respectively". It was also found that this regimen was absolutely safe in all stages of cirrhosis and there was significant improvement in the clinical parameters in all these patients¹².

Improvement was observed in clinical and biochemical parameters in the staging of cirrhosis in another study conducted by Ohkoshi S, et al, in 2015. It was found that new DAAs are safe and very effective to reverse the clinical and biochemical parameters in case of decompensated cirrhosis, improve the standard of life of these patients, decrease the urgency for liver transplantation and improve post-transplant outcomes¹³. Similar improvement was observed in the clinical and biochemical parameters in the staging of cirrhosis in another study conducted in 2016 by Van der Meer AJ et al. Significant improvement was observed in the clinical and biochemical stages in both compensated and decompensated cirrhotic patients¹⁴.

Limited sample size, poor elaboration and investigation regarding all parameters of cirrhosis, lack of data on

some important potential confounders, effects of the level of cirrhosis on response rate and application of only one scoring system for the staging of cirrhosis are considered as the main limitations of this study.

Finally, it is now a documented fact worldwide with many trials, that DAAS are the safe and most effective drugs in the management of both cirrhotic and non-cirrhotic cases. These drugs not only have very good outcome in term of virologic response but also improve all the clinical and biochemical parameters of cirrhosis. These drugs can be considered as a blessing and can be safely recommended for patients with advanced cirrhosis due to HCV infection. However, large trial is needed to address role of some other factors like age, sex, initial viral load, concomitant disease and genotype 3-subgroup in the down staging of cirrhosis due to HCV genotype-3 infections.

CONCLUSION

It is now concluded from results of this study that triple therapy including Daclatasvir, Sofosbuvir and ribavirin is not only effective in all cirrhotic patients with chronic hepatitis-C genotype-3a infections, but also improve the clinical and biochemical parameters and stages of cirrhosis in Pakistani population. Further study is suggested, both at national and international level for further confirmation this outcome in term of improvement in the stages of cirrhosis in HCV patients.

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Drug Prescribing Knowledge / Skill Among Undergraduate Dental Students

Drug Prescribing
Skill in Dental
Students

Sana Farooq¹, Muhammad Nadeem¹ and Zuhaib Younus²

ABSTRACT

Objective: This study was to assess the acquisition of prescribing skill of preclinical dental undergraduate students. Our targeted group of students is of third year BDS and Final year BDS students, of LCMD

Study Design: Prospective / descriptive / cross-sectional study.

Place and Duration of Study: This study was conducted at the Liaquat College of Medicine and Dentistry, Karachi from August 2017 to September 2017.

Materials and Methods: A total of 100 students of 3rd year and 4th year BDS were selected. A structured questionnaire was introduced to them to fill out. The questionnaire sought information about the demographics of the students, their undergraduate CPT teaching, experience of adverse drug reactions (ADRs) and drug interactions since starting work, confidence in drug usage and, in retrospect; any perceived deficiencies in their undergraduate CPT teaching¹⁻³.

Results: A total 100 students both boys and girls out of which 50 is from 3rd year BDS and 50 is from 4th year BDS participated in this study. Most common health condition treated in dental practice: to this question majority of respondent's answers Dental Caries denoted as =1 in questioner key (3 %), Periodontal disease =2 (26 %), Trauma =3 (6 %), Pulpitis =4 (68 %).

Conclusion: Dental caries was found to be the most common reason for drugs prescription encountered which includes treating and relieving its symptoms i-e; pain, ache, infection & swelling. Amoxicillin + Clavulanic acid was considered to be the most effective and convenient antibiotic to subside the infection. NSAIDs are given for pain removal most preferably. Definite posology of the drug was the main reason for error in prescription.

Key Words: Prescribing Drugs, Students, Patient, Skills

Citation of articles: Farooq S, Nadeem M, Younus Z. Drug Prescribing Knowledge / Skill Among Undergraduate Dental Students. Med Forum 2018;29(3):6-9.

INTRODUCTION

A sound knowledge of patho-physiology of a disease and clinical pharmacology and therapeutics (CPT) of a drug is required for secure and coherent prescribing³. Coherent drug use refers to the prescription of the right drug, for the right indication, in the right dosage and dosing frequency for the correct duration (WHO, 1985, 2002)^{1,6}.

Seem into the truth that the bulk of prescription-related errors in tertiary care hospital based system are made by junior doctors, there is a need to teach them and develop an intervention that will improve their prescription qualities⁶. The World Health Organization (WHO) recommends "defining the patient's problem (diagnosis), specify the therapeutic objective, and then, bearing in mind the different alternatives, choosing a

treatment with confirmed efficacy and safety; prescribing is a customized process. Treatment begins by providing the patient with clear information and instructions. After an suitable interval, results are evaluated. If the problem has been resolved, treatment may be clogged. If problem persists doctor have to look for other options of treatment that can vary from altering the prescription or surgical interventions according to the situation.

In the third year, students take a pharmacology course, focused on general pharmacology, chemotherapy, and specialized medical pharmacology, where they be taught about medical and dental issues. Also during the third year, students begin their clinical practice, becoming more concerned with patients from the various clinical courses⁹⁻¹⁴.

This study was therefore meant to conclude how effectively the undergraduate CPT teaching has prepared interns in Liaquat College of Medicine And Dentistry for secure and balanced prescribing, and how in retrospect the interns would modify their undergraduate training to get better patient safety when prescribing. The influence of internship training on the prescribing ability of the interns was also sought¹⁵⁻¹⁸.

MATERIALS AND METHODS

A total of 100 students were selected from the Liaquat College of Medicine and Dentistry of 3rd year and 4th

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year BDS. A structured questionnaire was introduced to them to fill out. The questionnaire sought information about the demographics of the students, their undergraduate CPT teaching, knowledge of adverse drug reactions (ADRs) and drug interactions since starting effort, confidence in drug usage and, in retrospect; any perceived deficiencies in their undergraduate CPT teaching ^{1,6}.

The possible answers of each question is denoted with the mathematical value to sort out the calculation in data entry.

Contents of Questioner:

What is the most common health conditions treated in dental practice?

Which is the most frequent non-steroidal anti-inflammatory drugs (NSAID) you prescribe?

Which antibiotics are most commonly prescribed & what is its common dose prescribed?

What are the most common errors occur during prescription of drugs?

What are your sources for prescription information?

Do you use World Health Organization (WHO) Guide to Good Prescribing for drug prescription?

Do you have appropriate knowledge about dose of Drug to be Prescribe?

Do you know about the frequency of Drug to be prescribed?

Do you know for how long the drug has to be given?

Did you know the correct route of drug delivery?

Do you know the half life of drug you commonly prescribe?

Do you know the common side effects of drug you commonly prescribe?

Do you know the chemical composition of drug you are prescribing?

The data obtained was analyzed with SPSS version 19. The relationship between the confidence and experience of the interns to prescribe and the number of clinical rotations done were compared using Chi-square, at a significance level of $P < 0.05$.

RESULTS

A total of 100 students both boys and girls out of which 50 are from 3rd year BDS and 50 are from 4th year BDS participated in this study. Most common health condition treated in dental practice: to this question majority of respondent's answers Dental Caries denoted as =1 in questioner key, Periodontal disease =2 (26 %), Trauma =3 (6%), Pulpitis =4 (68%) (As shown in figure 1).

Most frequent non-steroidal anti-inflammatory drugs (NSAID) you prescribe: to this question respondent's answers vary according to the choice and preference out of which Aspirin=2%, Synflex 28%, Brufen 12 %, Panadol 15%, Ansaed 43%. (Shown in figure 2)

Antibiotics are most commonly prescribed & what is its common dose prescribed: to this question respondent's

answers vary according to the choice and preference out of which penicillin 89%, metronidazol 8%, don't know 3% (shown in table 1)

The most common errors occur during prescription of drugs: According to 3rd and 4th year students the common error encountered is categorized into; forgot to mention the dosage 45%, Time span of a drug 7%, Drug name 3%, Side effects 27%, don't know 18%. (According to Figure 3)

Table No.1: Frequency distribution of choice and preference of antibiotic

Antibiotic	choice and preference (Frequency distribution)
Amoxicillin + Clavulanic acid	89%
Metronidazole	8%
Don't Know	3%
Total	100%

Table No.2: Frequency of fulfill the criteria regards prescription writing

Criteria	Yes (%)	No (%)
Follow universal basic guidelines	65%	35%
Appropriate knowledge about dose of Drug to be Prescribe	75%	25%
The frequency of Drug to be prescribed	92%	8%
Knowledge of Correct route of drug delivery	98%	2%

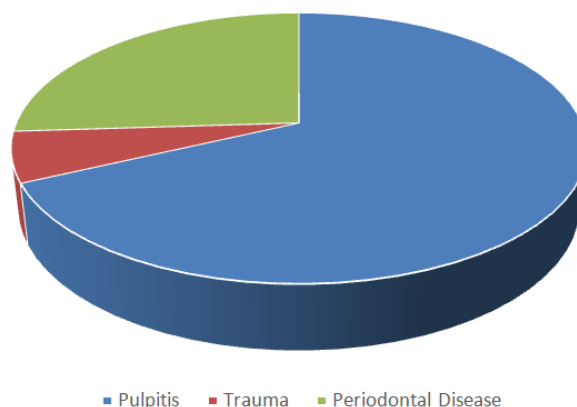


Figure No.1: Most common health condition treated in dental practice

What are your sources for prescription information: To verify the authenticity of prescription it is required to know where the source of information coming from expected answers were categorized as; Pharmacology guide books =1 (78 %), Self awareness = 2 (12%), Internet = 3 (10 %)

Use of World Health Organization (WHO) Guide to Good Prescribing for drug prescription: To evaluate that students are up to the mark on following universal

basic guidelines; No =1 (35%), Yes = 2 (65 %). (Shown in Table 2)

Knowledge of Correct route of drug delivery: No = 1 (2 %), Yes = 2 (98 %). Do you have appropriate knowledge about dose of Drug to be Prescribe; No = 1 (25%), Yes = 2 (75 %). The frequency of Drug to be prescribed; No = 1 (8 %), Yes = 2 (92 %). (Table 2)

For how long the drug has to be given i.e. the duration or time span of a drug you have been prescribing; 7 days 10%, 5 days 70%, 3 days 15%.

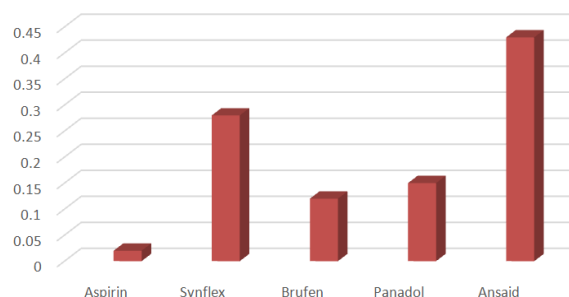


Figure No.2: Most common non-steroidal anti-inflammatory drugs (NSAID) you prescribe

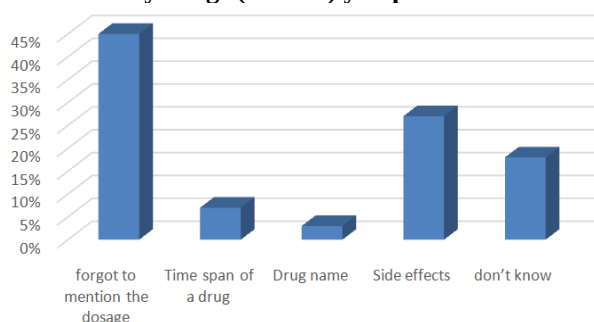


Figure No.3: The most common errors occur during prescription of drugs

DISCUSSION

In Pakistan (according to Pakistan Medical & Dental Council) the course curriculum or BDS 2nd and 3rd year include thorough study of pharmacology and pathophysiology, chemotherapy. Students learn about medical and dental issues. Also during third and fourth year, students start their clinical practice, becoming more concerned with patients from the various clinical courses but the prescription is guided and supervised by senior dentist and whatever clinical practice students perform they perform under the strict supervision of senior dentist⁷⁻¹¹.

The most common dental problems encountered in OPDs are dental caries (68 %) in present study conducted in Liaquat College Of Medicine And Dentistry conducted in Aug- Sep 2017, which is different from the study conducted by Moradabad, INDIA where the most common condition encountered is concluded on a whole as Pain. Here we concluded dental caries as the chief complain which ultimately involves pain as one of its presenting complain.

To prescribe medication it is important to know the pharmacokinetics and pharmacodynamics of the pain killers wither we use NSAIDS such as gelofen, ibuprofen was prescribed more than the other analgesics in our study^{1,8}. Most of the students are likely to prescribe as per their preference. .

Common mistake occur by junior dentist while writing a prescription when asked comes out to be that they forget the dosage of drug / mg (45 %) students common error of prescription writing encountered is this followed by, (18 %) forgot to mention the possible side effects of drugs, (6 %) forgot to mention for how long the drug should be taken, (2 %) forgot the drug name.

Source of information and up to dated knowledge about the commonly prescribed drugs in OPDs are answered to be Pharmacology guide books, from where students have learnt the universal prescription dosage and guide lines about the drugs, their frequency or intake , time span or duration, route of drug, half life of drug common side effects and there chemical composition . Most of the students select pharmacology guide book (70%) as there source of information in our research which differ from the research which we are following according to their research (34.67%) gather information from professors²⁰⁻²². Here authentication level and validity of information is much superior then the pioneer research because pharmacology guide used as a reference is much superior the professor knowledge.

The main precincts of this study were that only 13 open ended questions were used to carry out the survey, and a small sample size was considered for pilot study²³⁻²⁴.

CONCLUSION

Dental caries was found to be the most common reason for drugs prescription encountered which includes treating and relieving its symptoms i-e; pain, ache, infection & swelling. penicillin (Amoxicillin + Clavulanic acid) was considered to be the most effective and convenient antibiotic to subside the infection. NSAIDs are given for pain removal most preferably. Definite posology of the drug was the main reason for error in prescription.

The information of pharmacology among third and fourth-year BDS students in the School of Dentistry has gaps that could have an effect on patient security. More studies are desired to decide whether this issue affects the class of patient care and the success and safety of treatments. Since prescribing accurately is very important, it is needed to develop therapeutic guidelines, and to give pharmacological therapy courses²⁴

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

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Contraceptive Awareness in Female Population in District Mardan Khyber Pakhtunkhwa (KPK)

Hemasa Gul, Nuzhat Amin and Naila Noor

ABSTRACT

Objective: To assess the level of awareness about contraceptive use in female population and its long-lasting advantages.

Study Design: Observational / cross-sectional study

Place and Duration of Study: This study was conducted at the Gynecology OPD Mardan Medical Complex, Mardan from 1st July 2016 to June 2017.

Materials and Methods: A total of 150 patients and spouse attendants were surveyed for this study. The exclusion criteria included people with age below 18 years, females with chronic illness history, The inclusion criteria married couple aged 18-50 years of age were included in this study.

Results: The study constituted a total 150 females with their spouse mean age of 30 ± 15.1 years ranging from 18 to 50 years. 27(18)% female were of age 18-25, 60 (40%) females were of age range 26-30 years, 33 (22%) were of age 31-35 years, 18 (12%) were of age 36-40 years and 12(8%) were of age above 40. 60% out of the 150 patients, 70% of the females were with more than one pregnancy.

Conclusion: We conclude in our study that the community is moderately aware of the use of contraceptives and the acceptance of new contraceptive methods was less.

Key Words: Pregnancy, contraceptive methods, awareness, socio-demographic factors, child spacing

Citation of articles: Gul H, Amin N, Noor N. Contraceptive Awareness in Female Population in District Mardan Khyber Pakhtunkhwa (KPK). Med Forum 2018;29(3):10-12.

INTRODUCTION

The biggest concern of all the developing countries is the increase in population. The desire for a bigger family is more common and prevailed in the local population. The birth and fertility rates are high of those of developed countries. These rates have been dropped in the previous decade with the increase in awareness of contraceptives.¹ Reducing the unnecessary fertility for all age groups is due to the use of contraceptives.^{2,3} The high fertility rate is linked with underdevelopment of the countries.⁴ One of the aims of the World Health Organization (WHO) is to achieve safe motherhood by proper birth spacing.⁴ Literature highlights the advantages of proper birth spacing as enormous.⁴ There exist an inverse relationship between the prevalence of contraceptive rate and total fertility rate.⁶ The socio-demographic factors and pattern among the community are changing over the female population.

Specifically, the education of females is a big factor for changing the fertility believes and behaviors towards child spacing. The raising of awareness for contraceptive use and the identification of women perceptions towards it use is very crucial and needed. Moreover, the evaluation of the socio-demographic values over above-stated perception will create a positive difference.

MATERIALS AND METHODS

It was an observational cross-sectional study, conducted at outpatients department (OPD), Medical Complex Mardan district Mardan from 1st July 2016 to June 2017. A total of 150 patients and attendants were surveyed for this study. The exclusion criteria include all males, females with age below 18 years and unmarried, females with chronic illness history, whereas females of aged 18-50 years of age and married were included in this study. Patients detailed the medical history, physical examination and demographics were noted and stored electronically, moreover. The questionnaire consists of two major parts, Knowledge of contraceptives and Source of knowledge for modern methods of contraceptives. All the collected data was stored electronically & analyzed later by using SPSS version 20. Descriptive statistics were applied to calculate mean and standard deviation. Frequency distribution and percentages were calculated for qualitative variables like gender, socioeconomic

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status etc. Overall a P values less than 0.05 was considered statistically significant.

RESULTS

The study constitutes a total 150 females with the mean age of 30 ± 15.1 years ranging from 18 to 50 years. 27(18)% females were of age 18-25, 60 (40%) females

Table No.1: Demographics of respondents

Demographics	(n)	(%)
Living area		
Rural	99	66%
Urban	51	34%
Religion		
Muslim	120	80%
Non-Muslim	30	20%
Educational status		
cannot read and write	45	30%
Primary	30	20%
Matriculation	24	16%
Intermediate	21	14%
Graduate and above	30	20%
Socioeconomic status		
Low income	66	44%
Medium income	48	32%
High income	36	24%

Table No.2: Awareness and source of contraceptives.

Awareness & Source of Contraceptives	(n)	(%)
Births can be controlled		
Yes	105	70%
No	45	30%
known to contraceptives		
yes	120	80%
no	30	20%
Use of contraceptives		
Yes	90	60%
No	60	40%
Methods to control birth		
Modern contraceptives	48	40%
safe periods	12	10%
other	60	50%
Contraceptive methods known to responder		
injectable	30	20%
pills	54	36%
Norplant	21	14%
Condom	39	26%
Other	6	4%
Source of modern contraceptives		
TV	33	22%
Health worker	21	14%
Neighbors	21	14%
Family/Friends	66	44%
Other	9	6%

were of age range 26-30 years, 33 (22%) were of age 31-35 years and 18 (12%) were of age range 36-40 years and 12(8%) were of age above 40. More the demographics were summarized in Table 1. 60% of the females have the history of pregnancy, out of which 70% of the females with more than one pregnancy. The information in regards to awareness of contraceptives and its major sources were given below in Table 2.

DISCUSSION

For the past decade, knowledge and use of contraceptive have been increased for almost all countries of the world except with very low income.² the scenario in Asian developing countries is always of interest. We explore the perception/awareness of contraceptives and its usage to a local population in district Mardan. In our study, we observe a wider portion of the population aware of the contraceptives, but in actual they utilize very less. This is similar to various studies found in the literature.^{7,8,16} In spite of the Government implementations of health worker and awareness program throughout the country, the goals have not been achieved to control the population. The knowledge about the simple methods of contraceptives was less to the understudy population. To whom it is known, the most common method is others which includes the use of condoms. Another common method reported in our study was the use of oral pills; this is due to the most approachable availability and simple to practice and well known one of the safe methods. This finding is consistent with other published studies.^{9,10} The awareness of the modern contraceptives is limited. This could be attributed to the source of knowledge. We observe the main source of knowing the contraceptives was family and friends.^{14,15} The personal experiences and practices among family women were majorly affecting the current use. The conservation of the community does not allow health workers to provide information of the use and contraceptives. The knowledge of modern contraceptive method was though less in our findings as recent studies observed almost 95% of the married women known to at least one modern method of contraceptive.^{11, 25} we have observed the lack of awareness is due to the living area, education level and socioeconomic status of the family. The less education and with low-income families the awareness of the use of contraceptives were less. Another reason was the gap in births, which is less common and not with the acceptance of the women. The society is mainly dominated and cooperation to the wives was reported less from husbands.¹⁷ Previously few studies based on birth intervals have concluded the similar results. One of the studies were conducted in Riyadh in a rural area, the existing mean interval of almost 3 years with increasing age of women.¹³ This impacted the women and child health. The gap interval is only possible with the use of contraceptive. The

present study was an effort to highlight the need of awareness and use of contraceptives. The advantages of the common practices for its use should be highlighted on community and household level.

CONCLUSION

We conclude in our study that the community is moderately aware of the use of contraceptives and the acceptance of new contraceptive methods was less. This needs more attention at community and household level.

Author's Contribution:

Concept & Design of Study: Hemasa Gul
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 Data Analysis: Nuzhat Amin, Naila Noor
 Revisiting Critically: Hemasa Gul, Nuzhat Amin
 Final Approval of version: Hemasa Gul

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

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Outcome of External Fixation for Close & Acute Fractures of Shaft of Humerus in Adults

Shujaat Hussain, Tayyab Mahmood and Muhammad Iqbal

ABSTRACT

Objective: To assess the outcome of patients treated with external fixation for fractures of shaft of humerus.

Study Design: Descriptive / case series study

Place and Duration of Study: This study was conducted at the Department of Orthopaedic Surgery Quaid-e-Azam Medical College /B.V. Hospital Bahawalpur from May 2015 to October 2017.

Materials and Methods: The variable noted were age, sex, presenting complaint, duration of fracture, associated injuries and radiological finding before definitive management. The operative findings, site of fracture, postoperative course (pain, healing & mobility), Complications (swelling, neurovascular damage, infection, delayed and nonunion), Patients satisfaction, Clinical and radiological maturation of bone at fracture site were recorded.

Results: Total of 65 patients treated in study time. Fifty one were male and 14 were female. Mean age was 37 years (range 20 years to 40 years). The mean follow-up period was 16 weeks. (SD±4.7). There were 6 superficial infections treated successfully using oral antibiotics and no case was reported for non-union.

Conclusion: External fixation is good method of treatment for humeral shaft fractures. This technique although is surgical demanding but leads to decrease soft tissue trauma.

Key Words: Fracture of the humeral shaft, External fixation,

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INTRODUCTION

Fracture of shaft of Humerus is common fracture occurs 70,000 times in one year in North America. It is 3-5% of total body fractures.¹ By the new era in surgery, introducing the different methods of surgery and refining the surgical inventions, surgical treatment become dominant with passage of time. Operative treatment of diaphyseal fractures of Humerus is required in associated neurovascular injury, open fractures^{3,4}, polytrauma, bilateral fractures & non-unions^{3,4}. Otherwise all close & isolated fractures are conservatively managed because fractures of Humerus have tremendous capacity to heal⁵ but metabolic & endocrine abnormalities can affect bone healing⁶. Although malunion is common in conservative healing of fracture of shaft of Humerus but functional outcome and range of motion of shoulder and elbow joint become so good due to proximal ball and socket joint and upper limb involvement, that all deformities, angulation and shortening of Humerus bone is ignored. There are different methods in operative treatment like, dynamic compression plating, locking compression

plates^{7,8,9}, external fixation, and intramedullary (IM) stabilization. External Skeletal fixation has become popular over the past decade.^{10, 11}.

In 1907 A. Lambotte described treatment of humeral shaft fracture with a unilateral external fixator¹². Although external fixation method is commonly used in open shaft of humerus fracture or in skin burn with fractures where internal fixation by surgical treatment is not possible due to soft tissue defect. External fixation is also indicated in comminuted fractures or complex fractures of shaft of humerus where good reduction and maintenance of reduction by other surgical techniques is a challenging problem but when external fixation technique is used in simple close transfer or oblique fractures of shafts of humerus, very good results are achieved. In this minimum invasive technique where advantages of close reduction like preserving hematoma and minimum soft tissue insult is observed, at the same time advantages of the open surgery like proper reduction and strong stabilization of fracture with start of early range of motion of shoulder and elbow joints are achieved.

MATERIALS AND METHODS

A descriptive case series study was conducted in our institute, between May 2015 and October 2017, were studied. Duration of follow-up was from 4 months to 6 months. Inclusion criteria was close transverse and oblique fracture of humerus, fracture proximal, middle and distal shaft of humerus and acute fracture of humerus presented within 48 hours. Exclusion criteria

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was open fractures, comminuted fracture, intra-articular fracture, fracture of extreme ages and pathological fracture of shaft of humerus.

All cases, received in casualty, was examined and assessed for associated injuries. Investigations like urine C/E, blood C/E, serum sugar, viral markers, blood grouping, cross matching and serum renal function test, ECG/Echo (if needed) were also done. Standard AP and Lateral radiograph of humerus were taken.

Data was collected on a predesigned performa. The variable noted were age, sex, presenting complaint, duration of fracture, associated injuries and radiological finding before definitive management. The operative findings, site of fracture, postoperative course (pain, healing & mobility), Complications (swelling, neurovascular damage, infection, delayed and nonunion), Patients satisfaction, Clinical and radiological maturation of bone at fracture site were recorded.

General anesthesia was given to all patients. After getting the reduction of fracture site by close manipulation under image intensifier, 3 Shanz pins were passed anterolateral aspect of the proximal part of fractured humerus (along anterolateral margin of deltoid muscle) & 3 Shanz pins (sometimes 2 Shanz pins) were passed in the distal segment on lateral side of humerus, proximal to olecranon fossa. The proximal & distal Shanz pins were connected with the clamps of external fixator & horizontal connecting bars. The fracture reduction was checked in Image Intensifier. Connecting rods along with proximal & distal Shanz pins were tightened with the clamps. All patients were discharged after assessing the fracture reduction on radiograph within 24 hours. Subsequently radiographs were taken after 2nd, 4th, 8th, 12th, 16th and 20th weeks to see the callus formation at fracture site. Fracture union was assessed radiographically by seeing the callus formation and clinically by observing the abnormal movement of the fracture site. The whole follow up was taken by the researcher.

For this best site for proximal Shanz pins insertion is distal to insertion of deltoid muscle and anterolateral margin of humerus. Best distal Shanz pin side is just above the olecranon fossa and in radial condyle in

olecranon in fracture shaft of humerus. Minimum 3 cm distance from the fracture line is recommended during insertion of Shanz pin to avoid the access of fracture line with pin track.

Post operatively shoulder & elbow range of motion was started when pain subsided. However, all patients received cefuroxime 1.5g at induction followed by 750mg at 8 hours and 16 hours postoperatively. Physiotherapy was started at first day postoperatively. In follow-up evidence of union and range of motion of both shoulders and elbow joint were assessed. Radiologically bridging of callus at fracture site was seen and clinically pain free movement at fracture site was observed.

Operative Definition:

Grading	Fracture Healing in 3 months
Excellent	Good callus with good clinical healing and complete range of motion
Good	Callus formation with good clinical healing with acceptable range of motion
Fair	Poor callus with acceptable clinical healing & limited Range of motion
Poor	Non-union

RESULTS

Sixty five patients of fracture shaft of humerus were treated by external fixation. Mean age of patients was 37 years, range 20 years to 40 years. All fractures were close fractures. There was no intra-articular extension. Two cases were associated with head injury and 7 cases admitted with poly trauma, (associated fracture of radius and ulna of same side) External fixator was not removed till complete healing of fracture site. Forty nine cases (75.3%) showed union between 9 and 12 weeks, while 16 cases (24.7 %) showed union between 13 and 16 weeks. Average period of union was 14.63 weeks. Fracture site of all cases with external fixation was healed. Delayed union and nonunion was not reported and Bone grafting was not required in any case. Postoperative nerve damage was not seen.

Table No.I: Details of operative finding and healing

Injury-surgery interval		Operative time		Period of healing in weeks				Range of motion			
< 1 week	>1 week	< 60 min	>60 min	Radiological		Clinical		Complete	Good	Fair	Poor
25	40	54	11	9-12	13-16	9-12	13-16	50	12	03	0
38%	62%	83%	17%	49	16	55	10	77%	18%	5%	0%

Note: Range of Motion

Shoulder joint (Abduction, adduction, flexion, extension, internal and external rotation).

Elbow joint (Flexion and Extension)

Complete: 90-100 % (Shoulder and Elbow Joint) Good: 70-90 % Fair: 50-70 % Poor: less than 50 %

In 7 cases, restricted shoulder movements especially abduction of shoulder joint were found. In these cases proximal Shanz pins were inserted more proximally (Subcapital or Subacromial) in proximal and middle humeral shaft fracture. All movements were restored after removing the Shanz pin after complete healing of bone in 14 weeks. In 4 cases discharge from the proximal pin-tracks was seen and skin was released at site of pins in 3 cases. There was a single complication in the form of superficial infection secondary to skin necrosis treated with local debridement and antibiotics. Radiologically deformity, of shaft of humerus was found after complete healing of fracture. But overall clinical result were very satisfactory due to good functional outcome of upper limb. Patients were very much satisfied. The average operative time was 45 minutes. Average period for hospital stay was 12 days. Sixty cases (92.3%) had excellent outcome while 5 cases (7.7%) had excellent to good outcome regarding union and joint movement.

DISCUSSION

External fixation is also good option in the treatment of very distal humerus shaft fracture. It is minimum invasive technique which gets all benefits of close reduction, early range of motion and low stiffness of shoulder joint. External fixation is technically demanding in fracture shaft of humerus due to different configuration and site of fracture. Workers have reported but if the fracture is in proximal Humerus it become difficult to insert Shanz pins proximal to fracture site.¹⁵ So most proximal pin at subcapital or subacromian region, grossly restricts the shoulder movements specially the abduction of shoulder joint. If fracture line is at mid shaft of humerus level, still the insertion of proximal Shanz pins are technically demanding to save the maximum muscle mass and neurovascular structure. If the fracture line is at distal level of shaft of humerus the best site for inserting the Shanz pins is anterolateral of Humerus, distal to insertion of Deltoid muscle to get the maximum function of deltoid muscle and early range of motion of shoulder joint. Distal Shanz pins site in distal Humerus fracture is through the Radial condole and Olecranon of Humerus and proximal to Olecranon Fossa. In this technique pilot k wire is applied first, before inserting the Shanz pins in radial condyle and trochlea and above the olecranon fossa, to achieve good control of distal segment. Shanz pin position at humerus is very important. If proximal and distal Shanz pin apply at site where minimal bones and muscles movement occurs, the good and early range of motion of both shoulder and elbow joint, minimum joint stiffness, minimum pain, minimum pin tract infection and early bone healing results. If the Shanz pins passes through soft tissues enveloping the bone, sliding of muscles upon bone reduces which on one side leads to restricted

shoulder and elbow joint movement and on other side it also increases the frequency of pin tract infection^{16, 17}. This infection loses the pin and risk of ring osteitis increases. To avoid this, any loose pin is removed or is replaced.¹⁸ It is generally accepted that pin tract infection becomes low when all the principals of external fixation follows. Although sometimes compromise position of Shanz pins leads to restricted joint movement but after removing the Shanz pins aggressive physiotherapy starts of both shoulder and elbow joint. In this way functional outcome of both shoulder and elbow joints become good after few weeks after removing the external fixator.¹⁵ In our study infection and healing was quite acceptable as compared to other studies.^{15, 19}

CONCLUSION

External fixation is good method of treatment for humeral shaft fractures. This technique although is surgical demanding but leads to decrease soft tissue trauma.

Author's Contribution:

Concept & Design of Study:	Shujaat Hussain
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Data Analysis:	Tayyab Mahmood, Muhammad Iqbal
Revisiting Critically:	Shujaat Hussain, Muhammad Iqbal
Final Approval of version:	Shujaat Hussain

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

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Anatomical Pattern and Variations of Left Renal Vein

Anatomical
Variations of Left
Renal Vein

Robina Shaheen¹ and Muhammad Nasir Jamil²

ABSTRACT

Objective: Left renal vein is unique in its tributaries, course and drainage area. The complex embryological developmental pathway and genetic factors may render variability to anatomy of left renal vein. Most of the previous studies on left renal vein have been conducted in non Asian countries with very little contribution from Asia. So this study was designed to study normal and variable anatomical patterns of left renal vein in Pakistani people.

Study Design: Observational / cross sectional study.

Place and Duration of Study: This study was conducted in Forensic & Anatomy departments of King Edward, Fatima Jinnah, Allama Iqbal Medical College and Postgraduate Med. Institute Lahore from Feb. 2008 to Jan. 2009.

Materials and Methods: There were fifty male cadavers. Cadavers dissection was carried out. Left renal vein along with kidney was exposed. A small cut was given in inferior vena cava and a mixture of gelatin with Indian ink was injected. Left renal vein and its variants were outlined and studied.

Results: Normal preaortic vein was found in 84% of cases. Other patterns of left renal vein observed in this study were circumaortic (2%), retroaortic (2%), double (2%) and proximally double renal vein (10% of cases).

Conclusion: This first of its kind study from Pakistan which shows renal vein variants are not uncommon and have important implications from surgical and radiological perspective. It provides an anatomical reference for future research in the fields of surgery and radiology.

Key Words: Left renal vein, variant patterns, primary tributaries

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INTRODUCTION

The need to extensively study the variations in pattern of renal veins is highly desirable particularly in the fields of urology and renal surgery in order to ensure minimum surgical damage.¹The complex embryological developmental pathway and genetic factors may render variability to anatomy of left renal vein (LRV) thereby stressing upon the need to fully understand the latent anatomic variations for retroperitoneal operations. Literature review indicates left renal vein to be unique in its branches and drainage area. It may not always be single rather it may present as double, additional renal vein (ARV) or any other variant pattern. Supernumerary renal veins have been observed (0.8% and 3% of study cases).² Normally renal vein of either side is formed by convergence of three primary tributaries emerging from the hilum of kidney of respective side. The left renal vein joins inferior vena cava (IVC), passing anterior to abdominal aorta, promptly below renal artery at the level of L2

vertebra. Apart from its primary tributaries from left kidney, the it also receives the left suprarenal and gonadal veins.³ Occasionally, it is joined by the left inferior phrenic and rarely by one of the left lumbar veins.⁴

The left renal vein divergent forms have been divided into five groups: circumaortic left renal vein; retroaortic left renal vein type I; retroaortic left renal vein type II; duplication of IVC; and transposition of IVC.⁵The presurgical detection of these anomalies by imaging techniques has been rare (reported as 0.8% in computerized tomography) which is significantly less than their possible incidence as indicated by autopsy findings.⁶Knowledge of anomalous patterns in renal, aortic and general surgeries is important to avoid severe damage to the venous drainage of the left kidney and because intractable hemorrhage may occur in patients with unforeseen venous anomalies.⁷ Most of the previous studies have been conducted in non Asian countries with very little contribution from Asia. Whereas no research has been carried out on left renal vein and its variation in Pakistani population, this study is a pioneering piece of work from Pakistan.

MATERIALS AND METHODS

The study was conducted on 50 embalmed cadavers over a period of one year. Inclusion criteria were: cadavers with well-preserved renal vessels, IVC and kidneys. While exclusion criteria included: Apparently

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diseased kidneys, congenital anomalies of kidneys or absence of one kidney, small kidneys due to surgery. (e.g partial nephrectomy), renal tumor, injury to renal veins and inferior vena cava.

Cadavers were dissected by dissecting anterior abdominal wall. After removing other viscera IVC, left kidney and renal vein were exposed. IVC was ligated, well above and below the termination of renal vein. A small cut was given in IVC inferior to the lower pole of kidney. An injection medium consisting of a mixture of gelatin with Indian ink was injected into IVC which in turn filled renal veins. Left renal vein and its variants were outlined and studied.

Data Analysis: Categorical variables were described as percentages.

RESULTS

Patterns of left renal vein which were observed in this study are shown in table 1.

Table No.1: Different patterns of left renal vein

Pattern	Left renal vein (n=50)	
	no of cases	Percentage
Additional RV	-	-
Double RV	1	2%
Proximally Double RV	5	10%
Circumaortic Renal Collar	1	2%
Retro-aortic	1	2%
Normal	42	84%

Normal pattern was found in 84% of cases (Table 1). In this pattern number of primary tributaries forming left renal vein varied from two to seven. Most frequent number of tributaries was three which was found in 38% of cases, whereas two tributaries occurred in 24% and four in 22% of cases. Maximum number of tributaries observed was seven (2% of cases). In normal pattern primary tributaries usually emerged from mid hilum or its upper and lower parts on the anterior aspect. In 10% of cases a posterior primary tributary emerging from posterior aspect of renal hilum was present. In this case the other tributaries as usual emerged from anterior aspect of hilum and joined to form renal vein while the posterior tributary emerged from the posterior aspect of hilum, passed anteriorly above or behind the renal pelvis, then between the branches of renal artery to join the renal vein on its posterior aspect a little distal to its formation.

Double left renal vein was observed in 2% of cases (Table 1). In this pattern two renal veins (anterior and posterior) of approximately equal diameter were present independently. The anterior or pre-aortic vein was similar to the normal renal vein and joined the IVC at the level of L2. Suprarenal and testicular veins joined the anterior component. The posterior renal vein or retroaortic component formed by the union of three

primary tributaries, emerged from the upper part of hilum of left kidney. It joined IVC below the anterior component at the level of L3 (Fig. 1). During its retroaortic course it also communicated with left ascending lumbar vein.

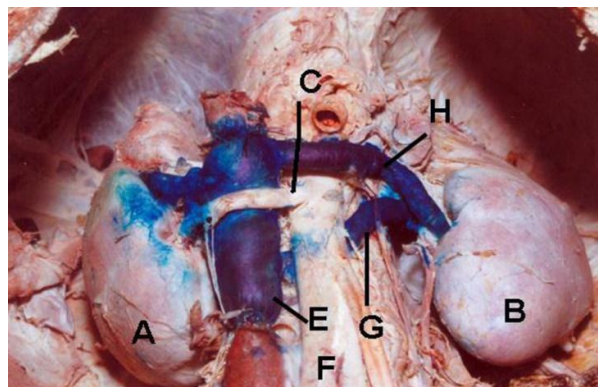


Figure No. 1: Anterior view of double LRV having an anterior component (H) and a posterior component (G) aorta (F), IVC (E), left kidney (B).

Proximally double left renal vein occurred in 10% of cases. In most cases two renal veins emerged from anterior aspect of mid hilum. The veins were parallel and each formed by union of two tributaries. The two veins later converged to form a single renal vein that joined IVC at the normal position (Fig. 2). Suprarenal and testicular veins joined single vein in most cases.

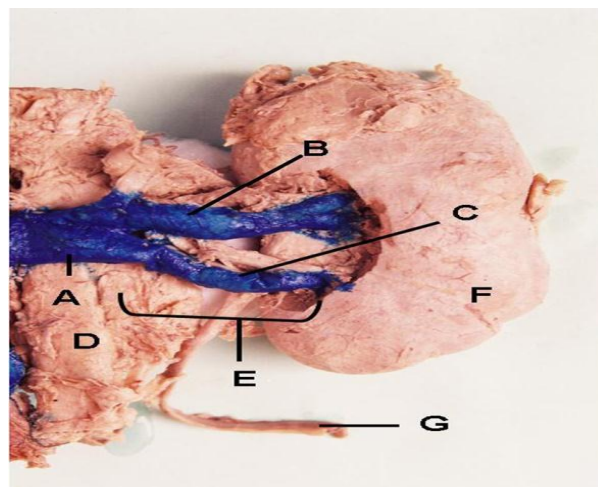


Figure No.2: Anterior aspect of left kidney (F) shows proximally double renal vein (E). Upper and lower (B, C) single renal vein (A).

Retroaortic left renal vein occurred in 2% of cases (Table 1, Fig. 3). In this case a renal vein formed by three primary tributaries originated from anterior aspect of the hilum of left kidney. At the renal hilum, two branches of renal artery passed in front of it while other branches passed behind it. It passed posterior to aorta to join IVC at the level of L3. There was no vein at normal position of left renal vein.

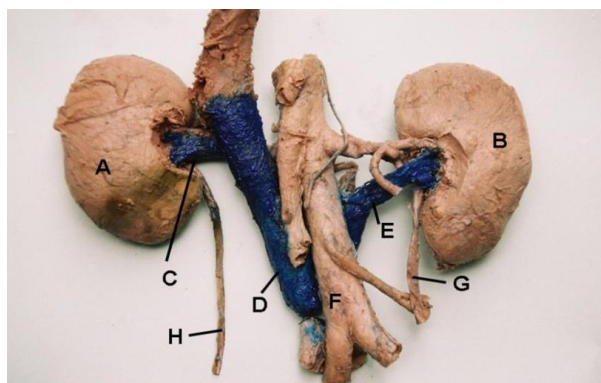


Figure No.3: Anterior view of both kidneys (A, B) showing left renal vein (E) passing retroaortically IVC (D); aorta (F).

Circumaortic renal vein was observed in 2% of cases. The anterior renal vein formed by the union of two primary tributaries originated from the anterior aspect of hilum of the kidney. It crossed medially in front of aorta and joined IVC at the level of L2. It also received the suprarenal and the testicular veins. The posterior renal vein originated from the posterior aspect of hilum by the union of two primary tributaries. It first passed medially and crossed behind the abdominal aorta, to join IVC at the level of L5 just above the bifurcation of IVC (Fig. 4). There was a small vein communicating the two veins at their commencement completing the collar around aorta.

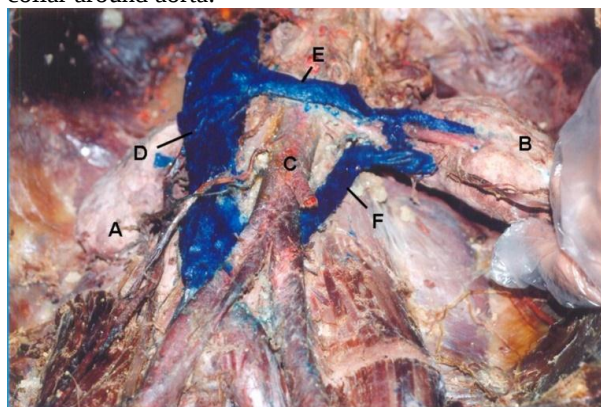


Figure No.4: Anterior view of circumaortic renal collar having an anterior component (E) and a posterior component (F). left kidney; C, aorta; D, IVC.

In the present study all normal and variable left renal veins terminated in IVC and no case was seen to terminate in veins other than IVC.

DISCUSSION

Pattern of normal left renal vein and its anomalous variants have been the focus of this study. Recent literature has asserted the significance of knowing the normal as well as its variant patterns for anatomical research as well as for surgical purposes.

The various patterns of left renal vein which were found in this study included preaortic, retroaortic and circumaortic veins. Normal pattern was found in 84% of cases similar to previous studies.⁸ In this pattern number of primary tributaries forming left renal vein at renal hilum varied from two to seven. No additional renal vein (ARV) was found on the left side which is in accordance with findings of Dhar et al¹ who also could not find an ARV on left side. However in studies by Janschek et al² frequency of occurrence of left ARV was 6.7%. Most researchers did not differentiate between ARV and double renal vein while reporting multiple renal veins. Less occurrence of ARV on left side is due to complicated embryological development of left renal vein and its passage to reach IVC which would discourage the retention of additional veins.

Double left renal vein, one part preaortic and other retroaortic part was found in 2% of cases in our study. Studies have reported double left renal vein having one component being retroaortic in 6.5% of cases.⁹ None of previous studies found both the veins passing anterior to aorta. Persistence of both the dorsal and ventral portions of circumaortic venous plexus during development results in this type of variant pattern in adults. Nayak¹⁰ also reported double right renal vein in his study where two veins of equal size were found and testicular vein joined the inferior vein instead of IVC.

Proximally double left renal vein has been observed in 10% of cases in this study. In this pattern renal vein was double in its proximal half and single in distal half. The mean length of single part of proximally double renal veins was much less than normal renal vein. Although this variant pattern has been reported by some authors, it has not been described by most of the previous studies. Satheesha¹¹, Biswas et al¹² and Verma et al¹³ also reported cases of proximal duplication of left renal vein. Senecail et al¹⁴ reported cases of partial distal duplication of left retroaortic renal vein. In these cases renal vein emerged as a single vein from hilum but divided in distal half into two or more veins. Such duplication was not observed in present study. This variant pattern may present a real trap in abdominal imaging.

In our study circumaortic renal vein was found in 2% of cases. In an extensive study Satyapal et al³ found circumaortic renal vein in 0.3% of cases. They mentioned that the incidence of renal collar varied widely in literature, with a range of 0.2% - 30%. Trigaux et al¹⁵ reported circumaortic renal vein in 6.3% of cases where the testicular vein was connected to both the anterior and posterior components. While in the present study suprarenal and testicular veins joined the anterior component. Multiple renal veins and circumaortic renal collar are not only susceptible to avulsion injuries but also provide collateral channel if main renal vein is blocked or damaged. Clinically

recognition of this pattern is important because circumaortic renal collar may lead to unexpected venous hemorrhage where surgeon may not suspect a posterior component after having identified a normal LRV.^{16,17}

Variant pattern of retroaortic left renal vein (RLRV) was also observed in this study (2% of cases). Satyapal et al³ in an extensive study in South African population reported the incidence of RLRV as 0.5%. According to Karkos et al¹⁸ the incidence of this anomaly as reported by anatomists in the literature ranges from 1.85-4.0%, while the reported incidence in radiological and surgical studies is 0.8%-3.7%. Yoshinaga et al¹⁹ reported a very low incidence of 0.49% in Japanese population and therefore suggested that the low percentage may be due to racial differences. In their study retroaortic vein was connected directly to azygos and lumbar veins and received posterior suprarenal vein. Complications of retroaortic renal vein include hematuria, thrombotic pain, left renal vein hypertension and varicocele.¹¹ Pressure from RLRV may cause congestion of left kidney which if untreated may lead to chronic interstitial nephritis. Retrograde flow due to RLRV results in reflux in the gonadal veins which leads to pelvic congestion syndrome in females and nutcracker syndrome in males.¹⁴

Any variation in termination of left renal vein was also noted. In the present study none of left renal vein variants joined any vein other than IVC. In our study a retroaortic LRV and posterior component of circumaortic LRV also joined IVC just above its formation at the level of L5. A case of RLRV joining the left common iliac vein instead of IVC was reported by Brancatelli et al.²⁰

Our study confirms the findings of other recent studies that the variations in the venous pattern are encountered more often than reported earlier in the literature. The difference in the incidence of various variant patterns in different studies as well as in this study may presumably be due to racial differences. The presence or absence of various venous variations can influence both the management and outcome of surgical procedures which involve renal veins. Also modern-day innovative imaging techniques require a sound understanding of renal venous anatomy.^{21,22} Appreciation of the most common anatomical variants, a high index of suspicion, careful reading of preoperative CT-Scan and safe operative technique are all vital if fatal complications are to be avoided.

CONCLUSION

The present study describes occurrence and anatomical features of various variations of left renal vein and their clinical implications in detail. This is an important baseline study from Pakistan which expands and augments the previous work. The findings of this study not only have implications but also provide an

anatomical reference for future research in the fields of surgery and radiology.

Author's Contribution:

Concept & Design of Study:	Robina Shaheen
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Revisiting Critically:	Robina Shaheen
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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Frequency of Early Postoperative Infective Complications Among Patients Undergone Surgery for Colorectal Carcinoma

Farwa Tariq, Tahira Islam, Mushahida Batool and Habib Ahmad

ABSTRACT

Objective: To determine the frequency of early postoperative infective complications after colorectal surgery among patients of colorectal carcinoma.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Surgery, Unit-III, Jinnah Hospital Lahore from: September 2016 to February 2017.

Materials and Methods: A total of 240 cases, between 18 to 60 years of both sexes with colorectal carcinoma who had undergone colorectal surgery either open or laparoscopic were included in the study. Information regarding their demographic data, presence of early post-operative infective complication and type of surgical procedure was obtained by the researcher and was recorded.

Results: The mean age was 39.05 ± 10.75 years with 117 (48.8%) males and 123 (51.3%) were female patients. Overall, wound infection was found in 37 (15.4%) and wound infection was not developed in 203 (84.6%). Abdominal abscess was found in 21 (8.8%) and abdominal abscess was not developed in 219 (91.3%). The frequency of wound infection was 13 (10.48%) and 24 (20.69%) among patients who had undergone laparoscopic surgery and open colorectal surgery respectively. On the other hand, frequency of abdominal abscess was 6 (4.84%) and 15 (12.93%) among patients who had undergone laparoscopic surgery and open colorectal surgery respectively. By using chi-square, it was observed that significant association was found between the occurrence of wound infection and type of surgical procedure having p-value 0.029. The occurrence of abdominal abscess was significantly associated with type of surgical procedure having p-value 0.027.

Conclusion: The prevalence of post-operative complications were more frequent in the open colorectal surgery group than in laparoscopic surgery group. Significant association was found between the occurrence of wound infection and type of surgical procedure. The occurrence of abdominal abscess was significantly associated with type of surgical procedure.

Key Words: Laparoscopic Surgery, Abdominal Abscess, Wound Infection

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INTRODUCTION

Globally, CRC is the third most commonly diagnosed cancer in males and the second in females, with over 1.2 million new cases and 608,700 deaths estimated to have occurred in 2008.¹ Rates are substantially higher in males than in females. Global, country-specific incidence and mortality rates are available in the World Health Organization GLOBOCAN database. In the United States, both the incidence and mortality have been slowly but steadily decreasing.² Annually approximately 142,820 new cases of large bowel cancer are diagnosed, of which 102,480 are colon and the remainder rectal cancers.³

Although some data support the view that some risk factors are more related to colon rather than to rectal cancer.⁴ Environmental and genetic factors can increase the likelihood of developing CRC.⁵

The surgical techniques used to treat colorectal carcinoma are either through open resection or laparoscopic surgery but their advantage over each other for short term and long term are still under research. Postoperative infective complications cause considerable morbidity in patients who had undergone surgery for colorectal carcinoma and their frequency vary depending upon operative techniques and condition. This study was planned to record the frequency of early postoperative infective complications after colorectal surgery among patients of colorectal carcinoma so that it may help patients and surgeons while managing these cases.

MATERIALS AND METHODS

This cross-sectional study was carried out at Department of Surgery, Unit-III, Jinnah Hospital

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Lahore from: September 2016 to February 2017. A total of 240 cases, between 18 to 60 years of both sexes with colorectal carcinoma who had undergone colorectal surgery either open or laparoscopic were included in the study, whereas patients not willing to participate, patients who had cancer infiltrating to adjacent areas determined by CT scan, patients with history of prior ongoing infection determined by history for the presence of fever and medical records and those with plasma neutrophil level less than $2 \times 10^9 / L$ determined by complete blood count were excluded from the study. Information regarding their demographic data, presence of early post-operative infective complication and type of surgical procedure was obtained by the researcher and was recorded. Confidentiality of the data was ensured. The data was entered and analyzed using SPSS version 17.

RESULTS

From two hundred and forty patients, the minimum age was calculated 21 years and maximum age was 59 years with 39.05 ± 10.75 years. There were 117 (48.8%) male patients and 123 (51.3%) were female patients. Overall, wound infection was found in 37 (15.4%) and wound infection was not developed in 203 (84.6%). Abdominal abscess was found in 21 (8.8%) and abdominal abscess was not developed in 219 (91.3%). The frequency of wound infection was 13 (10.48%) and 24 (20.69%) among patients who had undergone laparoscopic surgery and open colorectal surgery respectively. On the other hand, frequency of abdominal abscess was 6 (4.84%) and 15 (12.93%) among patients who had undergone laparoscopic surgery and open colorectal surgery respectively.

By using chi-square, it was observed that significant association was found between the occurrence of wound infection and type of surgical procedure having p-value 0.029. The occurrence of abdominal abscess was significantly associated with type of surgical procedure having p-value 0.027.

Table No.1: Descriptive statistics of the patients (n = 240)

Variable	No.	%
Age (years)	39.05±10.75	
Gender		
Male	117	48.8
Female	123	51.3
Wound infection		
Yes	37	15.4
No	203	84.6
Abdominal abscess		
Yes	21	8.8
No	219	1.2
Type of Surgical procedure		
Laparoscopic surgery	124	51.7
Open colorectal surgery	116	48.3

Table No.2: Cross-tabulation between wound Infection and Type of Surgical Procedure

Wound Infection	Type of Surgical Procedure		Total
	Laparoscopic Surgery	Open Colorectal Surgery	
Yes	13	24	37
No	111	92	203
Total	124	116	240

Chi-Square = 4.787 D.f. = 1 P-value = 0.029

Table No.3: Cross-tabulation between Abdominal Abscess and Type of Surgical Procedure

Abdominal Abscess	Type of Surgical Procedure		Total
	Laparoscopic Surgery	Open Colorectal Surgery	
Yes	6	15	21
No	118	101	219
Total	124	116	240

Chi-Square = 4.916 D.f. = 1 P-value = 0.027

DISCUSSION

From two hundred and forty patients, the mean age was 39.05 ± 10.75 years. There were 48.8% male patients and 51.3% were female patients. Overall, wound infection was found in 15.4% and wound infection was not developed in 84.6%. Abdominal abscess was found in 8.8% and abdominal abscess was not developed in 91.3%. The percentage of wound infection was 10.48% and 20.69% among patients who had undergone laparoscopic surgery and open colorectal surgery respectively. On the other hand, frequency of abdominal abscess was 4.84% and 12.93% among patients who had undergone laparoscopic surgery and open colorectal surgery respectively. Previous research showed that total fifty-six patients with age range of 14 to 70 years; thirty males and twenty six females were studied. Most of the patients were in fifth and sixth decades of their life. Only ten patients with colorectal carcinoma were in twenty-one to thirty years age group while two patients were below the age of twenty years.^{6,7}

In a non- interventional descriptive study, out of 75 patients included in the series, 53 were males and 22 females, with a male to female ratio of 2.4:1. The average age of the patients was 37 years, with males being in the range of 18 to 64 years and a mean of 36 years. In females average age was 38 years with a range of 22 to 57 years and a mean of 38 years. Thirty-four patients (45.3%) were in the third decade while 15 (20%) were in the fourth decade. Overall 66 (80%) patients out of 75 were below 50.^{8,9}

A study showed that about 17.1% patients developed early postoperative infective complications among patients who had undergone colorectal resection with

10.4% developing wound infection and 4% developing abdominal abscess.^{10,11}

By using chi-square, it was observed that significant association was found between the occurrence of wound infection and type of surgical procedure having p-value 0.029. The occurrence of abdominal abscess was significantly associated with type of surgical procedure having p-value 0.027. Existing literature showed that the frequency of wound infection and abdominal abscess was 5.9% and 2.9% respectively among patients who had undergone laparoscopic surgery as compared to 15% and 5.3% respectively with open conventional surgery. These results were found to be statistically significant.^{12,13}

In another study it was revealed that post-operative complications were more frequent in the open resection group than in LAP resection group (5.6% vs 27.8%; $P < 0.05$).¹²

CONCLUSION

The prevalence of post-operative complications were more frequent in the open colorectal surgery group than in laparoscopic surgery group. Significant association was found between the occurrence of wound infection and type of surgical procedure. The occurrence of abdominal abscess was significantly associated with type of surgical procedure.

Author's Contribution:

Concept & Design of Study:	Farwa Tariq
Drafting:	Tahira Islam
Data Analysis:	Mushahida Batool, Habib Ahmad
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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Comparison of Montelukast with Fluticasone for Control of Asthma in Children

Rabia Saeed, Khadeeja Mustafa and Najam u Saqib

ABSTRACT

Objective: To compare the efficacy of Montelukast and Fluticasone for control of asthma among children of age 4-10 years.

Study Design: A Randomized control trial study.

Place and Duration of Study: This study was conducted at the Department of Pediatrics Medicine Mayo Hospital Lahore from 12 January 2017 to 15 December 2017.

Materials and Methods: The ethical grant and informed consent was taken from Department of Pediatrics Medicine Mayo Hospital Lahore and parents before start of the study. The sample size of this study was 780 patients and they were randomized in two groups. Chi-square and student t test were used for categorical variables and pair t test was used to compare means. All the data was entered and analyzed by using the computer software SPSS version 21. In all the statistical interference, the p value of ≤ 0.05 was considered as significant.

Results: Overall, 780 patients were enrolled in this study and they were of both genders. The differences between both the groups were statistically insignificant except ASA ($p=0.010$) and operative time ($p=0.000$). The mean asthma RFDs and FEV₁ before treatment in group "M" was 63.1 ± 2.15 days and 2.5 ± 1.23 liter respectively. While, the mean asthma RFDs and FEV₁ before treatment in group "F" was 61.7 ± 2.56 days and 2.0 ± 1.35 liter respectively. The mean asthma RFDs and FEV₁ after treatment in group "M" was 133.50 ± 4.59 days and 2.9 ± 1.45 liter respectively. While, the mean asthma RFDs and FEV₁ after treatment in group "F" was 138.5 ± 4.67 days and 3.1 ± 1.12 liter respectively.

Conclusion: It has been concluded that Montelukast is not less effective than Fluticasone for asthma control among pediatric patients. Both the therapies of Fluticasone and Montelukast are well tolerated and can be used as first line drugs for asthma control.

Key Words: Montelukast, Fluticasone, Asthma, Pediatric patients.

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INTRODUCTION

Asthma is the long term chronic inflammation of the airway of lungs. Its characteristics and symptoms are different, chest tightness, shortness of breath, coughing, wheezing, obstruction of airway and bronchospasm^[1]. It becomes worsen in the morning and evening. It is caused due to genetic and environmental factors^[2]. Due to increasing industries, urban population, smog and air pollution, the cases of asthma are rapidly increasing up to 50 percent in the world. In 2015, nearly 358 million people had asthma throughout the world. According to Aga Khan University Hospital (AKUH), about 10 percent of the population of Pakistan has asthma^[3].

Asthma is one of the most prevailing chronic diseases of children and adults as well. A study conducted in Aga Khan University Hospital shows; 7.5 millions

Pakistani adults and 15 million children suffer from asthma^[4]. In pathophysiological mechanism of asthma, chronic inflammation leads to the narrowing of airway especially bronchioles and bronchi. It results in thickening of lamina reticularis, increased eosinophils. There is also involvement of immune system; cytokines, chemokines, histamine and leukotrienes. But cysteinyl leukotrienes play an important role in development of asthma^[5]. Therefore all the antileukotriene agents like Montelukast have been proved helpful in blocking cysteinyl leukotrienes. So, they are very useful in controlling the effects of asthma and its symptoms. These agents also reduce chronic airway inflammation in children and adults^[6].

Regarding the treatment and therapy of asthma, some very useful practical and clinical guidelines have been published by National Heart, Lung, and Blood Institute of America. According to these guidelines, anti-inflammatory drugs can be used for treatment of moderate asthma but inhaled corticosteroid (ICS) and antileukotriene should be first line drugs for asthma therapy^[7].

Many clinical trials show that Montelukast have similar effects like beclomethasone and triamcinolone. It controls symptoms of asthma and decreases the bronchial hyperresponsiveness^[8]. Many studies show

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variable results when comparison of Montelukast and inhaled corticosteroids (ICS) takes place. Both have different effects on lungs function and forced expiratory volume in 1 second (FEV₁)^[9]. Many large scale clinical studies have been done among aged patients, to compare the efficacy of orally intake Montelukast and inhaled corticosteroids (ICS) but no trial have yet been done on local level. So, we designed this study on local level and in pediatric patients to compare the effects of Montelukast and Fluticasone.

MATERIALS AND METHODS

This randomized control trial was held in Department of Pediatrics Medicine Mayo Hospital, Lahore, from 12 January 2017 to 15 December 2017. The ethical approval and informed consent was taken from institution and parents before start of the study. The sample size of this study was 780 patients and they were randomized in two groups. All children of both genders and age up to 10 years suffering from mild to moderate asthma were included but patients who had pulmonary TB, chronic respiratory illness, anatomic nasal disorder and severe airway obstruction were excluded in this trial.

All the patients were divided into two different groups named as 'M' group and 'F' group. Montelukast of 5-10 mg once at bedtime was given orally to patients included in 'M' group similarly, twice daily 2 puff of 50 microgram in the morning and evening of Fluticasone were inhaled to all patients of 'F' group. This study is basically conducted in house blinding procedure. All the patients were advised to have 3 clinic visits in 12 month trial. During each visit, physical examination, laboratory tests, baseline spirometry measurements, asthma symptoms and beta receptor agonists' use were performed in proper manner. All the patients were allowed to use the systemic corticosteroids if asthma is no being controlled adequately. The clinic visits were scheduled nearly 4 months during 12 month active treatment period. A standard spirometer was used to measure the FEV₁. Pre-bronchial and post-bronchial measurements were also measured on each clinic visit.

Chi-square test and student t test were used for categorical variables and pair t test was used to compare the means. All the data was entered and analyzed by using the computer software SPSS version 21. In all the statistical interference, the p value of < 0.05 was considered to be significant.

RESULTS

Overall, 780 patients were enrolled in this study and they were of both genders. 50% (n=390) patients were randomized to Montelukast (Group M) and 50% (n=390) were randomized to Fluticasone (Group F). The mean age, weight and height of the patients of group "M" was 8.25±2.47 years, 31.96±2.05 kg and

129.91±2.22 cm respectively. In this clinical trial, 67.4% (n=263) patients were boys and 32.6% (n=127) were girls. On the other, the mean age, weight and height of the patients of group "F" was 7.95±2.32 years, 29.93±2.27 kg and 127.98±1.61 cm respectively. In this group "F" 60.5% (n=236) patients were boys and 39.5% (n=154) patients were girls. The differences between both the groups were statistically insignificant except ASA (p=0.010) and operative time (p=0.000). The mean asthma RFDs and FEV₁ before treatment in group "M" was 63.1±2.15 days and 2.5±1.23 liter respectively. While, the mean asthma RFDs and FEV₁ before treatment in group "F" was 61.7±2.56 days and 2.0±1.35 liter respectively. The difference between asthma RFDs and FEV₁ of both "M" and "F" group were statistically significant. All this has been explained in (Table.1).

Table No. 1: Demographic and Baseline characteristics among the study groups

Variables	Montelukast (n=390)	Fluticasone (n=390)	Test of Sig.
Age (years)	8.25±2.47	7.95±2.32	t=0.186,p=0.853
Gender	B=67.4%, G=32.6%	B=60.5%, G=39.5%	$\chi^2=0.00$,p=1.0
Weight (kg)	31.96±2.05	29.93±2.27 kg	t=- 0.311,p=0.757
Height (cm)	129.91±2.22	127.98±1.61	t=- 0.7.97,p=0.000
Asthma RFDs (days)	63.1±2.15	61.7±2.56	t=8.27,p=0.000
FEV ₁ , (Litter)	2.5±1.23	2.0±1.35	t=5.41,p=0.000

Table No. 2: Results after Treatment

Variables	Montelukast (n=390)	Fluticasone (n=390)	Test of Sig.
Asthma RFDs(days)	133.50±4.59	138.5±4.67	t=- 1.20,p=0.232
FEV ₁ , L	2.9±1.45	3.1±1.12	t=- 1.80,p=0.240

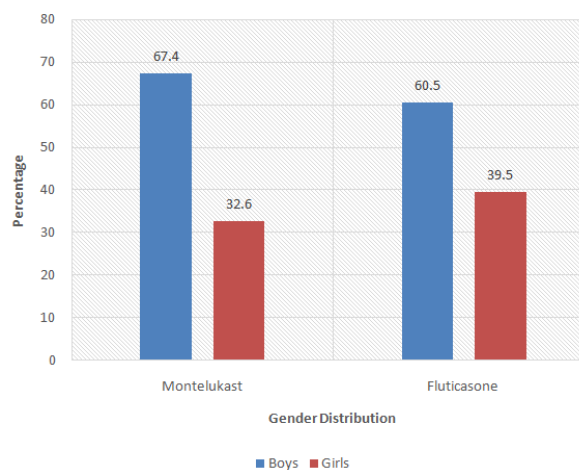


Figure No.1: Gender distribution with percentage.

The mean asthma RFDs and FEV₁ after treatment in group “M” was 133.50±4.59 days and 2.9±1.45 liter respectively. While, the mean asthma RFDs and FEV₁ after treatment in group “F” was 138.5±4.67 days and 3.1±1.12 liter respectively. The differences were statistically insignificant. (Table.2) The means asthma RFDs and FEV₁, before and after treatment was also statistically significant (p=0.232) and (p=0.240) respectively.

DISCUSSION

This randomized control study was designed to find out the comparison between effects of leukotrienes receptor antagonist Montelukast and inhaled corticosteroid (ICS) Fluticasone on mild asthma among pediatric patients of age 6-14 years. This trial explains that orally intake Montelukast is not less effective than ICS Fluticasone for asthma treatment. This 12 months treatment shows that both groups have 84% days during treatment in which they did not need any asthma medication. The difference of (RFD) rescue free days between Montelukast and Fluticasone was not greater than < 1 day / month. On the other hand, both the drugs have very significant effects on the Prebronchial FEV₁ and also decrease the peripheral blood eosinophils level.

Several clinical trials have been done among adults and children that show the efficacy of Montelukast and Fluticasone to reduce the asthma symptoms. The study by Barbara Knorr et al, in which 689 preschool children were randomly treated with 4mg Montelukast for 12 weeks^[10]. The daytime symptoms of asthma like wheezing, coughing, trouble breathing, activity limitation; and overnight cough; percentage of RFD were improved. It also explains that Montelukast has same effects regardless of sex, age and race.

There is another pediatric study by Jonathan, Bernstein, Barbara Knorr et al, 336 children with FEV₁ between 50% to 85 % of predicted value. 39% patients were receiving Montelukast and 33% receiving placebo. The result shows that FEV₁ increased from 1.85 to 2.01 liter in Montelukast group and from 1.85 to 1.93 liters in placebo group. This concludes that Montelukast improves the morning FEV₁^[11].

A multicentre, randomized, double blind trial by Theodore F, Reiss et al, demonstrates that Montelukast improves the airway inflammation and obstruction. It also increases the FEV₁ and reduces the peripheral eosinophilic level in blood. Due to its use rebound worsening effect and tolerance did not occur^[12].

An American base study by M. Luz, Garcia, Ulrich Wahn et al; that shows the comparison between Montelukast and Fluticasone for moderate asthma treatment. In this clinical trial, pediatric patients of age among 6- 14 years^[13]. This was very long study of 12 months and it was very comprehensive. This proves that Montelukast is not inferior to Fluticasone in asthma treatment. The difference between treatments was < 1

day/ month. The patients who were getting Montelukast has asthma attack 32.2% and those who were getting Fluticasone had asthma attack 25.6%.

To find the response to inhaled corticosteroids (ICS) and leukotrienes receptor antagonist (LTRA), a study was done by Stanley J. Szeffler, in which children from 6-17 year were treated with Fluticasone and Montelukast for 8 weeks^[14]. The result shows that 23% patients responded to Fluticasone and just 5% responded to Montelukast. It was concluded that children with low pulmonary function and high level allergic inflammation should receive Fluticasone and other asthma patient could get either Fluticasone or Montelukast. Similarly, for comparison of Fluticasone and Montelukast, the clinical study by Robert S. Zeiger, shows that ICS Fluticasone has very significant effects and has rapid improvements in asthma patient comparative to Montelukast^[14].

There are many clinical studies to show comparison between Fluticasone and Montelukast, one of them is “low dose Fluticasone compared with Montelukast” conducted by William Busse^[15]. It concludes that low dose Fluticasone should be first line drug for asthma therapy. It has effective role than Montelukast in asthma control.

Both the ICS Fluticasone and Montelukast are generally well tolerated. They do not have any significant difference in their treatment. They are good to control the asthma and to increase RFDs and FEV₁. Both the drugs play an important role in reducing the peripheral eosinophilic blood level.

CONCLUSION

Our study concluded that Montelukast is not less effective than Fluticasone for asthma control among pediatric patients. Both the therapies of Fluticasone and Montelukast are well tolerated and can be used as first line drugs for asthma control.

Author's Contribution:

Concept & Design of Study:	Rabia Saeed
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Data Analysis:	Najam u Saqib
Revisiting Critically:	Rabia Saeed, Khadeeja Mustafa
Final Approval of version:	Rabia Saeed

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

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Hepatic Dysfunction and Biochemical Abnormalities in Typhoid Patients

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ABSTRACT

Objective: To study hepatic dysfunction and biochemical abnormalities in typhoid patients.

Study Design: Observational/Analytical Study.

Place and Duration of Study: This study was conducted at the Medical Department of Mardan Medical Complex (MMC) Teaching Hospital Mardan and Pathology Department of Bacha Khan Medical College Mardan from June, 2016 to June, 2017.

Materials and Methods: This study included a total of 100 patients of typhoid fever and 50 individuals as control group. Typhoid positive serum was taken as that with visible agglutination at 1:320. To exclude false positive we used rising titer for widal test. Typhi dot was also positive in these patients. Moreover they had step ladder rising pattern of the fever. Alanine transaminase (ALT), aspartate transaminase (AST), bilirubin and serum albumin were performed on samples of these patients by a chemical analyzer.

Results: In present study fifty five patients had elevated ALT, mean value was 100 ± 12.265 U/L. Fifty percent of the patients had raised AST with mean value of 110 ± 15.233 U/L. Serum bilirubin was raised in 20% of the patients and mean value was 4.5 ± 2.623 mg/dl. Serum albumin was low in 25% of the patients. Mean value was 2.5 ± 1.532 g/dl. ALT, AST and serum bilirubin were significantly high and serum albumin was significantly low in typhoid patients as compared to control group.

Conclusion: The study concluded that typhoid fever is associated with elevated transaminases and bilirubin level as well as low serum albumin levels. As typhoid fever is common in our setup along with other infections, so any patient presenting with fever and the above mentioned biochemical abnormalities must be screened for typhoid fever for effective and prompt treatment and to reduce the morbidity and mortality associated with the disease.

Key Words: Typhoid fever, elevated ALT, AST, bilirubin.

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INTRODUCTION

Typhoid fever is a systemic bacterial infection caused by *Salmonella typhi*. It develops following ingestion of food or water that is contaminated with the organism. Incubation period is 6-14 days¹. It is a serious health problem in the developing countries and globally it affects about 16 million people and cause 69000 deaths annually². Typhoid fever is a multi-organ affecting disease and is associated with hematological abnormalities, gastrointestinal perforation and hepatitis with cholestasis³. Hepatic involvement in typhoid fever has been reported in 23-60% of patients⁴. Hepatic involvement can vary from mild elevation of amino transferases to a level indistinguishable from acute viral

hepatitis⁵. Fulminant Hepatitis has also been reported in typhoid fever². Few cases of hepatic granulomas have also been detected⁶. Typhoid fever is associated with significant hematological and biological changes and hepatic dysfunction as evidenced by elevated liver enzymes⁷. Complications in typhoid fever occur in 10-15% of cases, among these gastro intestinal bleeding, perforation and typhoid encephalopathy are the most serious⁸. Other complications include septicemia, peritonitis, metastatic abscesses, cholestasis, endocarditis, osteomyelitis and rash⁹. Mortality is 1% if treatment is started before the onset of complications and up to 15% if treatment is started after the onset of complications¹⁰. The aim of the study is to evaluate hepatic dysfunction and biochemical abnormalities in patients presenting with typhoid fever. As typhoid fever is a major health problem in developing countries and people are at high risk of contracting the disease so any patient presenting with deranged liver enzymes and clinically having sign and symptoms of typhoid fever should be screened for typhoid fever for immediate diagnosis and prompt treatment to reduce the complications of the disease and so reduce the morbidity and mortality: The biochemical changes are transient and disappear if the patient is treated in time.

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MATERIALS AND METHODS

The study was conducted in Medicine department of Mardan Medical Complex Teaching Hospital Mardan in collaboration with pathology department of Bacha Khan Medical College from June, 2016 to June, 2017. A total of 100 patients were included in the study. Fifty individuals were taken as a control group. Typhoid fever was diagnosed by widal test, Typhi dot test and clinically on the basis of step ladder pattern of fever. Typhoid positive serum was taken as that with visible agglutination at 1:320. To exclude false positive we used rising titer for widal test. Temperature of 100 °f was defined for fever.

Patients having temperature due to malaria, acute viral hepatitis, urinary tract infection and pneumonia were excluded from the study on the basis of history, examination and laboratory investigations.

Blood samples were collected from patients with typhoid fever in a gel tube. Serum ALT, Serum AST, Serum Albumin and serum bilirubin were determined. All these tests were performed by Microlab 300. Results were subjected to statistical analysis. P Value less than .005 was considered as significant.

RESULTS

A total of 100 patients of typhoid fever were included in the study. Male to female ratio was 60:40. Fifty individuals were included in the study as a control group. Alanine Transaminase (ALT), Aspartate Transaminase (AST), Serum bilirubin and Serum Albumin were determined of all the patients.

Fifty five percent of the patients showed elevated ALT level. Mean ALT level was 100 ±12.265 u/L which was significantly higher than the control group. Fifty out of 100 patients (50%) showed elevated AST Level, mean AST level was 110 ±15.233 u/L which was significantly higher as compared to control group. Twenty out of 100 typhoid patients (20%) had elevated bilirubin level. Mean bilirubin was 4.5 ±2.623 mg/dL and twenty five out of 100 patients (25%) had low albumin level, mean albumin level was 2.5±1.532 g/dL.

Table No.1: Frequency of biochemical changes in typhoid fever.

S. No	Biochemical Parameters in Typhoid Fever	
1	ALT	55%
2	AST	50%
3	Bilirubin	20%
4	Albumin	25%

The present study showed that hepatic dysfunctions are significant findings in typhoid fever and ALT, AST and Bilirubin level were significantly higher and serum albumin was low as compared to control group. P value

for ALT, AST, bilirubin and albumin is P<.00302, P<.00326, P<.0042 and P<.00322 respectively.

Table No.2: Mean value of Biochemical Parameters in Typhoid Fever

S. No	Mean value of Biochemical Parameter in Typhoid Fever	Mean Value of Control Group	P Value
1	ALT	100 ±12.265 U/L	P<.00302
2	AST	110 ±15.233 U/L	P<.00326
3	Bilirubin	4.5 ±2.623 mg/dl	P<.0042
4	Albumin	2.5 ±1.532g/dl	P<.00322

DISCUSSION

Typhoid fever is a systemic bacterial infection caused by salmonella typhi. Poor hygienic condition and under estimation of the disease are two main causes of this major public health problem in the developing countries¹. Typhoid fever presents with a lot of clinicopathological features. It may sometime present as fever of unknown origin as well¹¹.

Liver is commonly involved in patients with typhoid fever and significant hepatic dysfunction occurs. In the present study patients with typhoid fever were evaluated for hepatic dysfunction. ALT was raised in 55% of the patients while AST and serum bilirubin values were raised in 50% and 20% respectively.

A similar study has been conducted by Rasoolin Jad et al, that typhoid fever is associated with elevated ALT and AST levels, who reported 60% and 72% increase in the level of these enzymes¹². Enemchuk Ben et al also reported elevated ALT and AST in their study. which is similar to our study¹³. Korohi et al also reported that typhoid fever is associated with hepatomegaly and mildly deranged liver functions as evidenced by elevated levels of ALT and AST¹⁴.

In the present study bilirubin was elevated in 20% of cases and serum albumin was low in 25% of cases. The same observations have also been reported by Kayode et al that typhoid fever is associated with elevated bilirubin and low albumin levels¹⁵. Similar observations have also been reported by Bernard et al in their study¹⁶. Hepatomegaly, splenomegaly and moderate elevation of transaminase level are common findings that occur in 21-60% of cases of typhoid fever¹⁷. However severe hepatic derangement is a very rare incidence. It varies from less than 1% - 26%. Hepatic involvement in typhoid fever was initially reported by William¹⁸. The mechanism of hepatic damage is unknown but it is suggested that biochemical derangement of liver dysfunction results from invasion of the liver by salmonella or from high concentration of endotoxin which damage the hepatocytes¹⁹. The

bacteria may also proliferate in hepatocytes and produce cytokines which damage the liver²⁰. Hepatitis with jaundice, hyperbilirubinemia and low albumin level have also been reported invariably in typhoid fever^{21,22}. The same observations have also been reported in our study in which 25% of patients had low albumin level. Rise in bilirubin level is mainly due to canaliculi occlusion by swollen hepatocytes leading to rupture of bile canaliculi and resulting in raised conjugated bilirubin²³.

CONCLUSION

The study concluded that typhoid fever is associated with significant hepatic dysfunction as evidenced by elevated levels of ALT, AST, serum bilirubin and low serum albumin.

In the developing countries like Pakistan typhoid fever along with viral hepatitis, malaria, tuberculosis etc. is the major public health problem. Any patient presenting with hepatitis and elevated liver enzymes should be screened for typhoid fever and all clinicians must have high suspicion for immediate diagnosis and prompt treatment of typhoid fever. It will help to reduce its complication and will further reduce its morbidity and mortality.

Author's Contribution:

Concept & Design of Study:	Naveed Khan
Drafting:	Naveed Khan
Data Analysis:	Subhan-Uddin, Shah Zeb
Revisiting Critically:	Naveed Khan, Habib Ur Rehman,
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Comparison of Medium Weight Versus Light Weight Mesh in Patients with Unilateral Inguinal Hernia Undergoing Lichtenstein's Repair in Terms of Postoperative Pain Relief and Hospital Stay

Tahira Islam, Sajid Malik, Farwa Tariq and Habib Ahmad

ABSTRACT

Objective: To compare medium weight versus light weight mesh in patients with unilateral inguinal hernia undergoing Lichtenstein's repair in terms of postoperative pain relief and hospital stay

Study Design: Randomized controlled trial study.

Place and Duration of Study: This study was conducted at the Department of Surgery, Unit-III, Jinnah Hospital Lahore from: September 2016 to February 2017.

Materials and Methods: Two hundred cases (100 in each group) between 16-70 years of age of either sex presenting with unilateral, primary, reducible inguinal hernia determined by clinical examination were included in the study. All the operations carried out by same consultants on operative list under general anesthesia. Included patients were randomly divided into two groups using random table i.e. one group A in which hernia repaired by Lichtenstein technique using standard medium-weight composite mesh and second group (group B) using titanium-coated lightweight mesh. Data of all patients regarding postoperative pain relief and hospital stay was recorded.

Results: Mean age in Light weight and medium weight groups were recorded as 44.10±16.44 and 44.26±14.71 years respectively, 97%(n=97) in Light weight and 89%(n=89) in Medium weight group were male, patients who stayed two days in hospital were 89 [light weight=52, Medium weight=37], the patients who stayed three days in hospital were 81 [light weight=48, Medium weight=33] and the patients who stayed four days in hospital were 30 and all were from medium weight group. Mean value of hospital stay of the patients in light weights group was 2.48±0.502 days and its mean value in medium weight group was 2.93±0.820 days. Statistically significant difference was found between the hospital stay with study groups i.e. p-value=0.000

Conclusion: According to our study results light weight mesh in patients with unilateral inguinal hernia undergoing Lichtenstein's repair in terms of postoperative pain relief and hospital stay showed better outcome compared to medium weight mesh patients.

Key Words: Unilateral inguinal hernia, Lichtenstein's repair, Postoperative pain relief, Hospital stay, Medium weight, Light weight

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INTRODUCTION

Inguinal hernias by far are the most common types of hernias seen in our tertiary care settings.¹⁻⁴ The estimated lifetime risk for inguinal hernia is 27% for men and 3% for women. The Lichtenstein operation for inguinal hernia repair using mesh is one of the commonest operations done and the choice of the mesh to be used depends on the surgeon. However, the ideal mesh should be simple, cost effective, safe and free from complications.²

The conventional mesh has its shortcomings which include chronic groin pain, foreign body sensation and seroma formation.^{5,6} We have different types of mesh available like standard medium-weight composite mesh and titanium-coated lightweight mesh.⁷ In a study, comparing above mentioned meshes, pain measured at 1 month was significantly different between the two groups (80.3% vs 94.1% were pain free, P = 0.029), with the lightweight group giving better results.

The average consumption time for analgesics also differed significantly between the two treatment groups (6.1±6.3 days versus 1.6±2.5 days for those with the lightweight mesh (P<0.001). Hospital stay was not significantly different (2.3 ± 0.7 days versus 2 ± 0.8 days).⁸

In our setting we currently using both meshes only taking into account the affordability of patients. If quality of life is found better with either mesh in terms of postoperative pain profile and hospital stay, we may

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find an evidence for better and cost effective technique. More over there is no local study available and all international articles have addressed laparoscopic repair only. So current study may provide an evidence for open surgeries for this common issue.

MATERIALS AND METHODS

In this randomized controlled trial, we included 200 cases (100 in each group), from the department of surgical unit-III, Jinnah Hospital Lahore. The cases were between

16-70 years of age of either sex and all patients presenting with unilateral, primary, reducible inguinal hernia determined by clinical examination were included in the study whereas we excluded all cases with immune compromised (history of steroid intake and diabetes), and those suffering from any connective tissue disorder and having any history of previous surgery. Patients' informed consent was also obtained. All the operations carried out by same consultants on operative list under general anesthesia. Included patients were randomly divided into two groups using random table i.e. one group A in which hernia repaired by Lichtenstein technique using standard medium-weight composite mesh and second group (group B) using titanium-coated lightweight mesh. All the data was entered and analyzed in the SPSS (version 17). The descriptive statistics like age and hospital stay was presented in the form of mean + standard deviation while sex, postoperative pain relief, smoking history as frequency and percentage. The difference between postoperative pain profile and hospital stay was determined using chi square test and independent sample t test respectively.

RESULTS

In our study the patients who stayed two days in hospital were 89 [light weight=52, Medium weight=37], the patients who stayed three days in hospital were 81 [light weight=48, Medium weight=33] and the patients who stayed four days in hospital were 30 and all were from medium weight group (Table 1). The study results showed that the mean value of hospital stay of the patients in light weight group was 2.48 ± 0.502 days and its mean value in medium weight group was 2.93 ± 0.820 days. Statistically significant difference was found between the hospital stay with study groups i.e. p-value=0.000 (Table 2).

In our study the pain free outcome was noted in 176 cases in which 96 were from light weight group and 80 were from medium weight group, similarly the pain free outcome not found in 24 cases in which 4 were from light weight group and 20 were from medium group patients. Statistically significant difference was found between the study groups with pain free status i.e. p-value=0.001 (Table 3).

Table No.1: Basic Demographics of the patients

Variables	Light weight	Medium weight
Mean age	44.10+16	44 44.26+14.71
Gender		
Male	97(97%)	89(89%)
Female	3(3%)	11(11%)
Mean Height(m)	1.64+0.08	1.65+0.09
Weight (kg)	70.65+10.37	71.33+11.12
BMI(kg/m ²)	26.12+4.09	26.34+5.02

Table No.2: Comparison of hospital stays with study groups (n = 200)

Hospital stay (days)	Light weight	Medium weight	No. %	No. %
Two	52	52.0	37	37.0
Three	48	48.0	33	33.0
Four	-	-	30	30.0

Mean±SD 2.48±0.50 2.93±0.82 P value 0.000

Table No.3: Comparison of pain free with study groups

Hospital stay (days)	Light weight	Medium weight	No. %	No. %
Yes	96	96.0	80	80.0
No	4	4.0	20	20.0

P value p-value=0.001

DISCUSSION

History of hernia repair is very rich and since ancient times surgeons have tried to improve it bit by bit. Herniorrhaphy is one of the commonest general surgical procedures performed and about 700,000 hernia operations are performed each year in the United States which is still on rise. Post-operative pain, prolonged hospital stay and recurrence are a common problem associated with hernia surgery. Failure rate of less than 1% is reported from centers specialized in hernia surgery in contrast to much higher recurrence form non-specialized centers.⁹⁻¹⁰

Lichtenstein recommends always preserving the nerve to minimize the incidence of chronic pain. Some studies recommend that nerve ends be ligated to reduce the risk of chronic pain, but there were no studies on the outcome of these recommendations.¹¹⁻¹² A meta analysis conducted at Aberdine, UK conclude that the open and laparoscopic hernia repair are equally effective procedures and choice between them should be made on a case to case basis depending on patient preference and other characteristics such as age, work, health status etc.¹³

In this study the mean value of hospital stay of the patients in light weight group was 2.48 ± 0.502 days and its mean value in medium weight group was 2.93 ± 0.820

days. Statistically significant difference was found between the hospital stay with study groups. i.e. p -value=0.000.

A study by Pradeep Prakash et al¹⁴ showed that the mean post-operative hospital stay was 1.05 ± 0.2 days, and there was no significant difference in hospital stay between the two groups ($P = 0.24$). An audit published in 2009 have shown over all averaged 3.7 days hospital stay, averaging 3.3 and 3 days for bilateral and unilateral repairs respectively and any added procedures lengthened the hospital stay from 4 to 10.6 days.¹⁵

In our study free outcome was noted in 176 cases in which 96 were from light weight group and 80 were from medium weight group. Statistically lightweight patients significantly showed better pain free outcome compared to medium weight patients. i.e. p -value=0.001. There was not studies on comparison of light weight and medium weight with Lichtenstein's repair technique in past. However with laparoscopic technique few studies are available. Studies have also reported decreased early post-operative pain in LW mesh group because of less acute inflammatory response.¹⁶⁻¹⁷

In a study, comparing above mentioned meshes, pain measured at 1 month was significantly different between the two groups (80.3% vs 94.1% were pain free, $P = 0.029$), with the lightweight group giving better results. The average consumption time for analgesics also differed significantly between the two treatment groups (6.1 ± 6.3 days versus 1.6 ± 2.5 days for those with the lightweight mesh ($P < 0.001$). Hospital stay was not significantly different (2.3 ± 0.7 days versus 2 ± 0.8 days).⁸

One study by Pradeep Prakash et al¹⁴ demonstrated that one hundred and thirty-one completed follow-up of 3 months, 66 in heavyweight mesh group and 65 in LW mesh group. Early post-operative convalescence was better in LW mesh group in terms of early return to walking ($P = 0.01$) and driving ($P = 0.05$). The incidence of early post-operative pain, chronic groin pain and QOL and recurrences were comparable.

Shah et al.,¹⁸ conducted a retrospective analysis of 67 patients who undergone LIHR with either heavyweight polypropylene mesh or LW polyester mesh and they reported a 3 times higher rate of chronic pain (18.7% vs. 5.7%, $P = 0.05$ in polypropylene mesh group as compared to LW mesh group at 1-year follow-up.

Agarwal et al¹⁶ in a prospective double-blind randomised controlled study comparing LW and heavyweight polypropylene mesh in TEP repair of inguinal hernia, showed that LW polypropylene mesh was associated with significantly better pain scores, patient comfort, and sexual functions.

CONCLUSION

According to our study results light weight mesh in patients with unilateral inguinal hernia undergoing

Lichtenstein's repair in terms of postoperative pain relief and hospital stay showed better outcome compared to medium weight mesh patients.

Author's Contribution:

Concept & Design of Study:	Tahira Islam
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Progressive Rise in Wound Fabrication at Sialkot

Sajid Hussain

ABSTRACT

Objective: to find out the rising patterns and trend of fabrication injuries in respect of demography, site and nature of injuries.

Study Design: Observational / Descriptive study

Place and Duration of Study: This study was conducted at the Department of Surgery, Allama Iqbal Memorial Teaching Hospital from Jan 2015 to Dec 2017.

Materials and Methods: The reports of its examining officer compared with reports of District Standing Board from 2015 to 2017 along with all relevant records

Results: Total number of cases from 2015 to 2017 are 797, only 304 cases were reexamined by the District Standing Board, The most common weapon used was blunt, head was the most frequently involved site followed by hand, nose, forearm, teeth injury.

Conclusion: There is rising trend of fabricated injuries in society because of enmosity, superiority, implicate falsely for internal motives, medical professionals should declare all cases ethically, morally and honestly.

Key Words: Scarce, Invented, Standing Medical Board, Blunt

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INTRODUCTION

Pakistan is one of the populous country of South Asia with an inherited medico-legal system based on police investigation and authorized medical examination.¹

From initial times the egoist nature of human beings under the influence of power compel them for violence and torture to impose their ideas and in order to get their superiority they cause infliction of fabricated injuries which is becoming a major problem for the forensic experts. These injuries may be fictitious, invented and forged and hence grouped as self inflicted or self suffered. These injuries are produced to connect someone with the crime, torturing for compensation claims. Very scarce literature is available regarding fabricated injuries globally and locally in various districts of this province and this country^{2,3}. No authenticated principles have been laid down to declare such injuries as fabricated as there are lots of wound or cross version for alleged actual injuries on the opposite party.

The infliction of such injuries may produce publicity and their pattern is just like as seen in process of self destruction.

controversies which exist at the time of examination and investigation to implicate the enemy falsely to change the dimensions and manipulate the evidence by distorting, deforming, reshaping the exact nature of the These fabrication injuries are now becoming one of the political abuses of medicine and thereby destroying all ethical, religious norms, human rights violations and torturing the innocents^{4,5}. All of this ultimately puts the medical professionals, legal experts and victims of such incidences in the embracing position which is very much disturbing, upsetting the cognition process of all three people.

Sialkot is the district of more than four million population with urban and rural population connected to border areas where a large number of incidences of fabricated injuries occur. The objective of the study was to find out the current rising trends and pattern of wound fabrication in particularly the demographic aspects, most involved body area, most commonly used weapons and alleged fabrication at first MLR or re-examination.

MATERIALS AND METHODS

This observational study has been conducted at Allama Iqbal Memorial Teaching Hospital, Sialkot and the study period extends from January 2015 to December 2017. All the data was collected from the challenged medico-legal cases from whole of the district Sialkot comprising four Tehsils i.e. Pasrur, Sambiryal, Daska and Kotli Loharan. District standing medical board (DSMB) consist of medical superintendent, district health officer, surgeon, district medico-legal officer as a second tier of examination after first medico-legal

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examination conducted by medico-legal officer in all DHQ's, THQ's and RHC's. This study reviewed all the medical record of the injuries mentioned in the first medico-legal report either been challenged by the accused or by the injured, FIR of the cases, police inquest reports, available circumstantial evidence like clothes worn at the time of injuries signed or not signed by the first examining officer, shoes etc, radiological evidence like X-rays, CT scan, MRI, Punjab Forensic Science Agency reports and the presence of first medico-legal officer along with original record, investigating officer with all required documents to probe the actual facts. All cases included even demography of all those cases which were not examined by DSMB, All cases with incomplete record and cases not examined by the DSMB regarding fabrication injuries were excluded from study.

RESULTS

Total number of medico-legal cases in calendar year January 2015-2017 was 797. Out of these every year number of cases which were challenged before the DSMB on the instructions of area magistrate were 193 (in 2015), 287 (in 2016) and 317 (in 2017). Out of which 137 cases in 2015, 173 cases in 2016 and 183 cases in 2017 re-examination was not done either because of the non-appearance of injured or absence of police/police record or because of the non compliance of the investigations advised by DSMB. The cases which were re-examined by the DSMB were 56 in 2015, 114 in 2016 and 134 in 2017. Whole data was processed and analyzed in SPSS-20. Demographic analysis showed the occurrence of more medico-legal cases in the month of June & July i.e. 35 in 2015, 63 in 2016, 69 in 2017 and lesser number of cases were reported in November & December i.e. 10 in 2015, 14 in 2016 and 11 in 2017. (Table 1)

Table No.1: Time of infliction of injuries

Year	Time		p-value
	AM	PM	
2015	11	45	0.003*
2016	37	77	
2017	20	114	
TOTAL	68	236	

Table No.2: Kind of weapon used

Kind of weapon	2015	2016	2017	p-value
Blunt	42	80	79	0.0012*
Sharp	5	13	8	
Blunt & Sharp	5	9	11	
Firearm	4	6	8	
Not mentioned	-	6	28	
Total	56	114	134	

Most of the cases came in evening/night 236/304 (77.6%) and 68/304 (22.3%) came in morning. Most

common age group involved was between 21-30 (20/34 in 2015, 34/114 in 2016, 43/134 in 2017) and 31-40 (20/56 in 2015, 34/114 in 2016, 43/134 in 2017) respectively. Area of involvement was in order from head, left hand, right hand, nose, and forearm to teeth. (Table 2)

The most common weapon used was blunt (66%), sharp (8.5%), blunt & sharp (8.2%), firearm (5.9%) and in 34/304 (11%) weapon was not mentioned. Most common site was head (31%) in the form of bone exposed injuries then left hand (13%) in the form of injuries to little finger, index finger, 5th metacarpal while right hand (11%) showed fracture of middle finger, index finger and thumb followed by nasal bone fractures (9%), forearm injuries in the form of fracture of ulna (8%) mostly of left side as compared to right side, teeth injuries (5%) were seen in the form of incisors and canines followed by injuries on other parts of the body like legs, thigh, back and abdomen in the form of lacerations, incised wounds, abrasions and contusions. Only 31/304 (10.1%) injuries were declared by first medicolegal officer as fabrication, while 132/304 (43.3%) were declared as non fabrication, 35/304 (11.5%) referred on circumstantial evidence and in 103/304 (33.8%) nothing has been mentioned by first examining officer. (Table 3)

Table No.3: Fabrication injuries

Year	Total No of Cases	Fabrication		p-value
		1st MLO	By DSMB	
2015	56	11	42	0.026*
2016	114	12	89	
2017	134	8	112	
Total	304	31	243	

All cases have been presented before the DSMB where fabrication was proved in 243/304 (79.9%) while in very few cases 33/304 (10.1%) fabrication was not proved and traumatic nature came up in 28/304 (9.2%) cases.

Table No.4: Non Fabrication/Circumstantial evidence

Non Fabrication		p-value	Circumstantial Evidence		p-value	Not Mentioned
1st MLO	DS MB		1st MLO	DS MB		1st MLO
25	8	0.117	6	6	0.894	14
33	13		15	12		54
74	12		14	10		38
132	33		35	28		106

The percentage of agreement with the first examining officer regarding presence of fabrication was 31/273 (11.3%) while in 235/273 (86%) were declared as fabricated, included non fabrication injuries and non mentioned cases while no difference found in cases of traumatic injuries in the opinion of first MO 35/304 (11.5%) and DSMB 28/304 (9.2%) where court

of law was requested to decide the matter on the basis of circumstantial evidence. (Table 4)

DISCUSSION

Since the first examining officers are not the experts in the forensic medicine while preparing MLR's. So majority of the cases are embedded with discrepancies all over the world. These alleged injuries are involved in triple crime of harming self or implicate others in false charges against innocent or alleged accused or to enhance the gravity of the crime. And since doctor is not a witness of crime so these matters of self suffered are usually discussed before the experts of standing medical board in order to define the particular nature of injuries as fabricated. There are various forms of such injuries ranging from wounds, fractures and mostly involving the accessible parts of the body like head, face, nose and forearm. These fabricated injuries are not just practiced in Pakistan but also globally.²

Most authors have commented that the fabricated injuries are superficial in nature but these findings are not consistent with our study as both superficial and deep parts of the body have been involved in our study. The predominance of male involvement in fabricated injuries as compared to female is consistent with the results of other studies at national level⁶. As the males work in the society and may disrupt and develop conflicts which may lead to injuries as study conducted in Jinnah hospital, Lahore showed 85.44 % male as compared to 14.6 % female. Male predominance was also expected and a ratio 5.2:1 as predicted by various studies⁷ which is also in line with worldwide trends. Male predominance was also reported by Haridas et al., Garg et al., Malik et al and Husani et al.^{8,9,10,11}

The incidence of males were 5 times more in female, these were also consistent with other studies carried out in this country and in neighboring countries. Our study is also consistent with the study carried out by Bhullar et al., where males 84.6% were 21-24 (57.7%) of age and upper limbs was involved in 80 % of cases.

The most common age group involved was between 31-40 year followed by 21-30 year because of the reasons mentioned in other studies as they are economically productive and busy in outdoor activities. Our results are consistent with the studies carried out globally^{12,13} and in studies carried out locally^{14,15}, maximum number cases were reported in younger age group¹⁶ (21-40yrs) disturbing individually or to whole family physically and mentally for disability, followed by middle aged group and very less incidences were found above 60 year of age in particularly make us its traditional and religious factor of favoring and respecting old ones(7.2%).

The most commonly affected sites for fabricated injuries were head and face as most involved exposed area in interpersonal violence¹⁷, upper limbs and lower

limbs followed by other areas of the body and this is consistent with many studies but not consistent with the some studies where upper limb (47%), head (17%) and mixed type (14%) were found.

The fabricated injuries are most commonly incised wounds and sometimes contusions while lacerations are rarely self inflicted injuries as predicted by study carried out in Mumbai, India¹⁸ 2016 while in our study commonly used weapons were hands and blunt followed by sharp edged weapons which is consistent with the study of Haridas et al.

In our study the most common weapon used was blunt as compared to the study which was carried out in India^{19,20} where most common were the sharp weapon injuries. The findings of our study are also consistent with a study conducted at Jinnah hospital, Lahore and 72.5 % of blunt weapons presented in the medico-legal cases in a study carried out at DHQ Hospital Abbottabad²¹.

Gorea et al., studied 757 cases of medico-legal injuries and out of which 62 cases were fabricated injuries in the form of cut fractures^{22,23,24}, majority of the fractures were on upper limbs as compared to lower limbs. Areas of body prone to fracture were more on the bones of left hand as compared to the bones of the right hand followed by the fracture of ulna (5%) mostly of left forearm as compared to right ulna fractures. Our study results are not consistent with the study carried out in neighbor countries where tibia(41%), olecranon process of ulna/elbow(17%) outer table of parietal and frontal bone(2%) proximal phalanx of thumb(1%), nasal bone at bridge of nose(1%) were involved, no data available locally for comparison.

Maximum number of cases was reported in the evening and early night hours 236/304 as compared to early morning/ day time 68/304 The results of our study are consistent with the other studies carried out in Indian Punjab.

Higher incidents were found in month of June & July (167/304, 54.9%) due to increase in crop harvesting in this season. Our study is consistent with the studies in other centers where rural population was involved 1.6 times more in fabricated injuries as compared to urban areas as described in other studies where rural (61.5%) and urban(38.5%).

Our study showed more fabricated injuries not primarily declared by first examining officer while only 10.5% non fabricated injuries found to be correct. This study is more informative as compared to the study done in Larkana division where 60 % cases were found to be correct and 20 % cases were found to be incorrect by DSMB. Our study is consistent with the study of Zubair Hussain et al., carried out in Rawalpindi²⁵.

Geographic area of distribution of fabricated cases were variable among all tehsils in order of majority Skt, Pasrur, Daska, Sambrial. Lack of education, jealousy, enmity and family rivalry were the major motivational

forces to counterfeit the fabricated cases against others. Our study is also consistent with studies done at Rahim Yar Khan and Larkana.

CONCLUSION

There is a rising trend of fabricated, forged, invented injuries in the society because of enmity, superiority and to implicate others falsely for internal motives. Medical professionals should declare the medico-legal cases honestly on ethically, morally and technically on sound grounds in order to meet the ends of the justice not being influenced by any pressure. Lapses and deficiencies found by DSMB should be conveyed to the first examining officers in order to project the positive image of medical jurisprudence.

Author's Contribution:

Concept & Design of Study: Sajid Hussain
 Drafting: Sajid Hussain
 Data Analysis: Sajid Hussain
 Revisiting Critically: Sajid Hussain
 Final Approval of version: Sajid Hussain

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

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Effect of Glycemic Control on High Sensitivity C-Reactive Protein Level in Type 2 Diabetes Mellitus

Glycemic Control
& C-Reactive
Protein in
Diabetes

Zulfania¹, Soheb Rehman², Tahir Gaffar³ and Mehwish Durrani²

ABSTRACT

Objective: To determine with any certainty the association of glycemic control (HbA1c) and high sensitivity C-reactive protein (hs-CRP) in diabetes. Therefore, the present study was carried out to ascertain the relation of glycemic control with hs-CRP levels.

Study Design: Prospective / Longitudinal study

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

Materials and Methods: This longitudinal 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 hs-CRP were recorded. Statistical analysis of the data was done by spss version 20 using Pearson correlation test to correlate HbA1c levels with hs-CRP levels.

Results: The mean levels of HbA1c reduced from baseline ($9.64 \pm 2.25\%$) to ($8.56 \pm 1.99\%$) till second follow up. The correlation between hs-CRP and HbA1c was positive in baseline ($r=0.207$, $p=0.020$), the strength of correlation improved in first follow up ($r=0.331$, $p=0.003$), in the second follow up the correlation was again positive ($r=0.232$, $p=0.124$). The correlation of change in hs-CRP and HbA1c was also positive in all the three data.

Conclusion: The study concluded that there is a significant positive correlation between hs-CRP and HbA1c.

Key Words: HbA1c, glycemic control, , hs-CRP, Type 2 diabetes mellitus

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INTRODUCTION

Diabetes mellitus is a metabolic disorder characterized by increased blood glucose levels due to defective insulin secretion, its action or both. Due to long term hyperglycemia, this disease causes damage and dysfunction of organs including heart and blood vessels¹. WHO has reported that 30 million people were suffering from diabetes (mainly type 2) worldwide in 1985; the number increased to 217 million in 2005, and is expected to touch the figure of 366 million by the year 2030².

WHO survey in 1995 showed that Pakistan was at 8th position in top ten countries having high diabetic prevalence. The same survey has estimated that in year 2025, Pakistan will be on the 4th position with 14.5

million people having diabetes³. About 7.2 million individuals are suffering from this disease in Pakistan in 2012⁴. The prevalence of diabetes has reached to 7.89% in Pakistan in 2015⁵. In other countries of South East Asia the prevalence of diabetes varied much in 2014, with Mauritius having a prevalence of 14.8%, India had 9.1%, Sri Lanka 7.6%, Bangladesh 6.3%, Bhutan 5.8%, Nepal 4.9% and with Maldives 4.8%⁶.

Cardiovascular diseases (CVD) are the most prevalent cause of morbidity & mortality among diabetics⁷. A study has reported that CVD was present in 30% diabetics in Pakistan⁸. Diabetes is an independent risk factor for atherosclerosis, sharing common features of pathophysiology such as endothelial dysfunction, low grade inflammation and oxidative stress⁹. Therefore, it seems that early detection of cardiovascular risk can improve the morbidity status & mortality rate among diabetics.

C-reactive protein (CRP) is a nonspecific marker of inflammation which is a strong independent predictor of cardiovascular risk in future^{10,11}. American Heart Association and Centers for Disease Control recommended CRP as biomarker of CVS risk in 2003¹². CRP is an acute phase protein produced by liver during inflammation. Atherogenic mechanism of CRP includes impaired production of endothelial nitric oxide, uptake of LDL by macrophages, proinflam-

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matory cytokines release, and expression of monocyte chemotactic protein-1, vascular cellular adhesion molecule-1 and intercellular adhesion molecule-1¹³. Review of the available reports is unable to determine with any certainty the association of HbA1c and hs-CRP in diabetes. The aim of this study was to find out the relationship of glycemic control with elevated hs-CRP level, so that treatment in diabetics can be targeted towards drugs that lower CRP levels along with anti-diabetic medication.

MATERIALS AND METHODS

This longitudinal prospective 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 breastfeeding were excluded.

Data Collection: Detailed medical history and physical examination was done on 125 diagnosed cases of type 2 diabetes mellitus. Three fasting blood samples were taken from each patient; one initially on day one, second after three months and third after six months of the initial sample. Whole blood before centrifugation was analyzed for HbA_{1c} on immunoassay method by Architect *i1000SR* machine and expressed as percentage (%). hs- CRP was measured from plasma through automated analyzer architect *ci 8200* machine by Immunoturbidimetric method and it was expressed in mg/dl which was then converted to mg/L.

Data Analysis: Data was analyzed to measure the frequency and percentages for categorical variables while mean and standard deviation were calculated for numerical variables using SPSS version 20. Pearson's correlation coefficients were determined for numerical variables i.e. between HbA1C and hs-CRP.

RESULTS

In this study, 125 patients of type 2 DM were recruited and followed up for 6 months. About 70% of the data was available for the final analysis due to loss of follow up. In current study, HbA1c less than and equal to 7 was taken as good glycemic control whereas HbA1c more than 7 was taken as poor glycemic control.

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 (%). Mean baseline glycemic control (HbA1c0) was 9.64 ± 2.25 %. The mean glycemic control at 1st follow up (HbA1c1)

decreased to 8.83 ± 2.01 %. The mean glycemic 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 high sensitive C - reactive protein at baseline (hs-CRP0) 4.71 ± 2.97 mg/l. The mean 1st follow up hs-CRP (hs-CRP1) and hs-CRP in 2nd follow up (hs-CRP2) was 4.35 ± 3.09 mg/l and 4.15 ± 3.09 mg/l respectively. The changes in hs-CRP values in baseline, first and second follow up were insignificant.

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

Sr. No	Variables	Mean (%)	Standard Deviation	95%CI	p value
1	HbA1c0 HbA1c1	9.64 8.83	2.25 2.01	-1.491 to - 0.132	0.020
2	HbA1c1 HbA1c2	8.83 8.56	2.01 1.99	-0.362 to 0.910	0.396
3	HbA1c2 HbA1c0	8.56 9.64	1.99 2.25	0.409 to 1.762	0.002

Table No.2: Baseline, 1st and 2nd follow up hs -CRP

Sr. No	Variables	Mean (mg/l)	Standard Deviation	95%CI	p value
1	hs -CRP 0 hs -CRP 1	4.71 4.35	2.97 3.09	-0.598 to 1.332	0.453
2	hs -CRP 1 hs -CRP 2	4.35 4.15	3.09 2.88	-0.750 to 1.151	0.678
3	hs -CRP 2 hs -CRP 0	4.15 4.71	2.88 2.97	-0.365 to 1.500	0.231

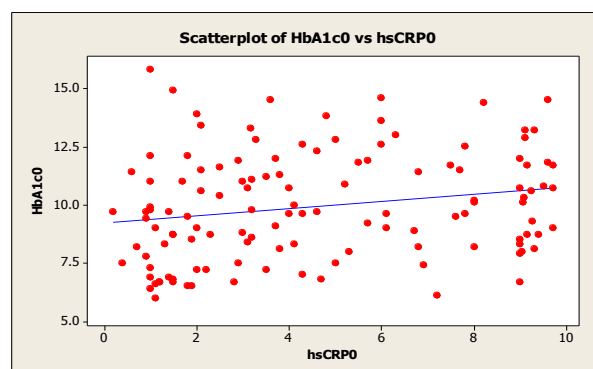


Figure No.1: Correlation of HbA1c0 and hs-CRP0 in baseline data $r = 0.207$ and $p = 0.020$.

Figure 1 shows significant small positive correlation of HbA1c0 and hs-CRP0 in baseline data (with $r = 0.207$ and $p = 0.020$). Figure 2 shows significant positive correlation of HbA1c1 and hs-CRP1 in first follow up data (with $r = 0.331$ and $p = 0.003$). Figure 3 shows positive correlation of HbA1c2 and hs-CRP2 in 2nd follow up (with $r = 0.232$ and $p = 0.124$).

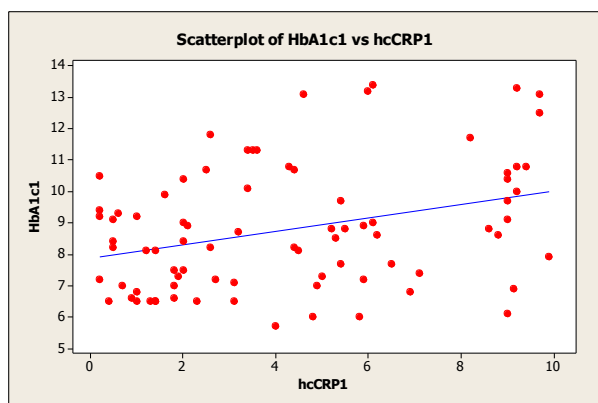


Figure No.2. Correlation of HbA1c1 and hs-CRP1 in first follow up data ($r = 0.331$ and $p = 0.003$).

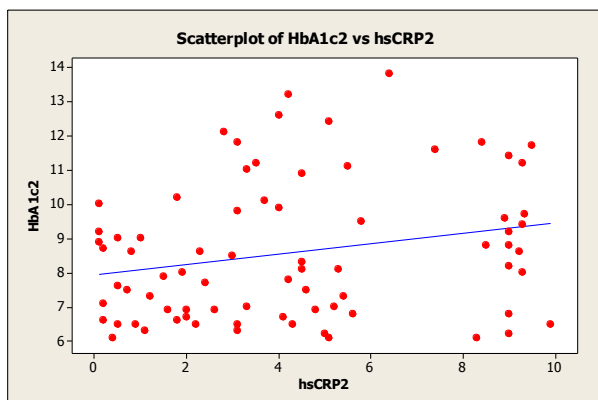


Figure No.3. Correlation of HbA1c2 and hs-CRP2 in 2nd follow up ($r = 0.232$ and $p = 0.124$).

DISCUSSION

This study was conducted to determine the hs-CRP levels in type 2 diabetics and to correlate it with HbA1c levels (glycemic control). A significant positive correlation was found between hs-CRP at all three stages of sampling i.e. baseline, first follow up after 3 months and second follow up after 6 month of initial sampling.

The baseline HbA1c in this study was significantly reduced in the first follow up (done after the month of Ramadan). The HbA1c dropped further in second follow up sample, the reduction in HbA1c measured from baseline to second follow up was statically significant. Similar drop in HbA1c level was reported in a study in which type 2 diabetics were followed up for four months^{14,15}. In a study done in type 2 diabetics to observe change in HbA1c level in Ramadan, there was a drop of 0.3% in mean HbA1c when measured two weeks after Ramadan¹⁶. The current study showed a significant positive association of hs-CRP with HbA1c in baseline data, the correlation was stronger in the first follow up. In second follow up the correlation was again positive. All these findings suggest a positive correlation of hs-CRP with HbA1c in type 2 diabetics. Our findings were similar to various studies including a

study conducted in India on newly diagnosed type 2 diabetics in which hs-CRP positively correlated to HbA1c¹⁷. A prospective study of overweight type 2 diabetic females also found a positive correlation of hs-CRP and HbA1c¹⁸. A case control study in which hs-CRP levels were measured in Saudi type 2 diabetics and compared with controls, the correlation of hs-CRP with HbA1c was also measured and reported to be positive¹⁹. In a cross-sectional study of newly diagnosed type 2 diabetics in India showed a positive correlation of hs-CRP and HbA1c²⁰. In another study in India in which type 2 diabetics and non-diabetics were investigated, the correlation of hs-CRP with HbA1c was significant and positive²¹. Oxidative stress occurring in diabetes due to poor glycemic control might be a link of correlation between HbA1c and CRP causing increased inflammatory markers level in poorly controlled diabetes.

On the other hand a prospective study in which an intervention was done to reduce HbA1c levels by educating the diabetics about glycemic control and pharmacological interventions for four months, no change in hs-CRP level was observed and no correlation was noticed in the two variables¹⁵. This might be due to the reason that the duration of follow up was shorter and it could not influence the levels of HbA1c sufficient enough to have an effect on CRP level. The study of CRP in healthy diabetics without complications showed no correlation of CRP and HbA1c because of the study being conducted only in well controlled diabetics²². Therefore, it can be deduced from the present study that since the glycemic control improves CRP levels, the inflammatory processes occurring in the body during diabetes can be suppressed by reducing HbA1c levels.

CONCLUSION

The strength of this study was its prospective design which enabled us to draw a few references as far as the relationship of hs-CRP and HbA1c was related. As we proved a positive association of hs-CRP and HbA1c we can recommend that if glycemic control is kept better we have lower chances of getting cardiovascular diseases but we need another cohort study of longer duration and sample size to show that cardiovascular complications develop only in those diabetics who have poor control and high hs-CRP.

Author's Contribution:

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The Effect of Delay in Examination, Vaginal Sampling on Results of Semen Analysis in Rape Victims

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ABSTRACT

Objective: To know the effect of delay in examination, taking vaginal samples and their effect on the laboratory results in cases of rapes. And to compare the results of the vaginal samples collected in cases presenting within 72 hours of the act to that presenting after 72 hours.

Study Design: Observational / cross sectional study.

Place and Duration of Study: This study was conducted at the Department of Forensic Medicine and Toxicology of Khyber Medical College, Peshawar from January, 2010 to December 2011.

Materials and Methods: The medico legal Centre of Peshawar is in Khyber Medical College. The rape cases occurring in two year were recorded in Performa's and then data was analyzed.

Inclusive Criteria: The sample included all the female sexual assault cases brought by police to the forensic medicine department, KMC, Peshawar during the period.

Exclusive Criteria: Examination of assailants and male victims of sexual assault cases are not included in this study. Results of the laboratory were obtained from the analysis of specimen in the laboratory. Data analysis was done on SPSS 16.

Results: The specimens taken for semen analysis were analyzed in laboratory for 33 cases. The samples from vagina were taken in first 24 hours, in 24-48 hours, 48-72 hours, and after 72 hours. The percentage of positive case in first 24 hours was 1 (3.03%), in 24 to 48 hours were 2(6.06%) , in 48 to 72 hours were 4(12.12%) and 26 (78.8%) cases examined after 72 hours were totally negative.

Conclusion: The findings of the research summarize that the most vulnerable age group among the female sexual assault cases is between 14 -20 yrs. The proportion of those cases which are positive for semen analysis is only 6.1%. It was known from the analysis that the results were positive with the earlier the examination done and the earlier the samples taken. The examination done later and sample taken after 72 hours were showing totally negative results. Awareness should be evoked among the general population using print media about the importance of timely forensic examination

Key Words: MLE, MLO, STD's

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INTRODUCTION

Rape is defined in Women Protection Bill 2006 as:¹ A man is said to commit **rape** who has sexual intercourse with a woman against her will, without her consent, with her consent, when the consent has been obtained by putting her in fear of death or of hurt, with her consent, when the man knows that he is not married to her and that the consent is given because she believes that the man is another person to whom she is or believes herself to be married; or with or without her consent when she is under sixteen years of age.

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Explanation: Penetration is sufficient to constitute the sexual intercourse necessary to the offence of rape.

Forensic medicine has a critical role in striking a balance between public, law and police properly.² While Justice System needs collection and preservation of evidence, interpretation and presentation of findings and providing expert opinion in proceedings. A thorough forensic examination starts with a complete detailed history of the event.^{3,4}

Government of Punjab has devised guide lines for the medico legal examiner, which ensure examination of females only by authorized registered women medical officer granted by judicial orders as per Women Protection Act, working in Government institute.⁵

Informed consent of the victim herself is taken or of the guardian if the victim is less than 12 years of age or is unable to give consent due to some disability before the start of MLE.⁶

A detailed history is taken followed by complete body examination. Evidence is collected with objectivity. In addition to photographs and routine samples, Urine should be taken for pregnancy test and toxicology

screening.⁷ Blood for grouping, DNA analysis and toxicological screening. Vaginal swabs are taken even if victim is menstruating.

Checklist of forensic evidence collection from victims shall be made. Step by step documentation and record is made for evidence.

According to WHO, Most protocols recommend that forensic evidence like sperm, blood, hair, and saliva samples should not be collected 72 hours after the incident. If the victim has showered, urinated, or changed clothes, it will significantly affect the quality of the sample.⁸

MATERIALS AND METHODS

The research work was conducted in Department of Forensic Medicine and Toxicology of Khyber Medical College, Peshawar. It is an observational, cross sectional study for a period of 2 years

Inclusive Criteria: The sample included all the female sexual assault cases brought by police to the forensic medicine department, KMC, Peshawar during the period. **Exclusive Criteria:** Examination of assailants and male victims of sexual assault cases are not included in this study.

A Performa was devised to record the history, observations and results of laboratory. Data was analyzed on SPSS 16.

The time of examination was given special emphasis. The cases examined in first 24 hours were recorded separately, than 24 -48, 48-72 hours and after 72 hours. The data of results and timing of examination was analyzed.

RESULTS

From the data collected the information about address was interpreted and it was known that among the 33 females 60.6% were from urban area and 39.4% were from rural back ground. (Table 1). The analysis about age showed that in the data collected the minimum age of the victim was 5 yrs, maximum is 32 yrs, with the mean age of 16.73-⁺4.7yrs. (Table 2)

Table No.1: Address

	Frequency	Percent
Urban	20	60.6
Rural	13	39.4
Total	33	100.0

Table No.2: Age.

	N	Min	Max	Mean	Std. Deviation
Estimated Age	33	5	32	16.73	4.785

3.03% were examined in first 24hours, 6.06% were examined in 24-48hours,12.11% were examined in 48-72 hours and 78.8% were examined after 72 hours. . (Table 3) 6.1% cases shows presence of spermatozoa

on vaginal swabs. 93.9% shows negative results. (Figure 1).

Table No.3: Examination of cases after incidence

Examination after incidence	Frequency of cases	Percentage
1 – 24 hours	1	3.03 %
24 – 48 hours	2	6.06 %
48 – 72 hours	4	12.11 %
After 72 hours	26	78.80 %
Total	33	100.00 %

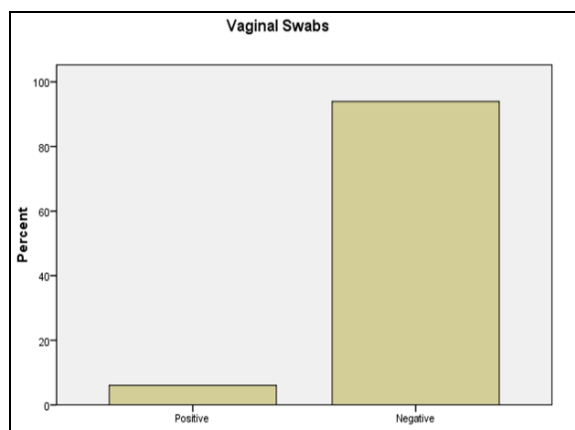


Figure No.1: Vaginal Swabs with percentage

DISCUSSION

Sexual violence is one of the most violent crimes in the world. The data is usually collected from various NGO's, police, hospitals and surveys. However the actual number of cases is much higher.

Our study in Peshawar showed that the incidence of sexual assault is more in urban areas. 60.6% are the inhabitants of urban area and 39.4% belongs to rural areas. These facts are against the study done in Bangladesh, where the sexual assault cases were detected more in rural area.⁹ Moreover the females are bound to their homes strictly in rural areas that's why the incidence of sexual assault is low in rural areas.

The mean age of the victim affected is 16.73. Most of the victims fall between the ages of 15 and 20 years showing that adolescent girls are more at risk of sexual assault than older women. These results are same like studies done in Pakistan, India, Malaysia, Denmark and South Africa.^{3,4,10-14}

As most of the victims fall between the age of 15 – 20 yrs, This is the same results as shown by the studies done in Lahore^{15,20}, Bangladesh⁹, turkey¹⁶ and other countries.¹⁷⁻¹⁸ This shows that young girls are more at risk of sexual assaults everywhere than the elderly ladies.

Among victims 3.03% were examined in first 24hrs, 6.06% were examined in 24-48hrs, 12.11% were examined in 48-72 hrs and majority of them 78.8% were examined after 72 hrs. Vaginal swabs were taken in all the victims for detection of semen. Only

6.1% shows positive results indicating recent sexual activity. Negative results did not exclude the sexual activity as 78% cases presented after 72 hrs of the incident. This may be a cause of loss of evidence in such cases.

A standardized evidence collection and documentation procedure should be adopted.¹⁹ It is estimated that worldwide, one in five women will become a victim of rape or attempted rape in her lifetime.⁹ Due to lack of legal or medico legal, scientific awareness and knowledge among victims, the end result is either 'justice hurried is justice buried' or 'justice delayed is justice denied' to the victims.

CONCLUSION

Rape is a heinous crime that has serious physical & psychological consequences. Anti women attitude by society, police & health professional have compelled many victims not to report the crime.

Medico legal services have been established in country, but little evaluation of such services with respect to impact and use of medico legal evidence has been done.

Recommendations:

1. Attention should be paid to the protocols & professional practices that are part of medico legal evidence.
2. Proper sexual assault kits must be provided in all the medico legal centers.
3. Manuals should be developed for the MLO's to review specialized medico legal techniques and detail description of injuries.
4. Blood and urine samples in sexual assault cases must be taken for drug detection.
5. Sexual assault victims must receive emergency medical treatment and psychotherapy.

Author's Contribution:

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

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Administration into Endotracheal Tube Balloon on Hemodynamics and Intraocular Pressure during Intraoperative Period

Sabir Khan, Faiza Liaquat and Hassan Jameel

ABSTRACT

Objective: To investigate the effect of lidocaine instillation into the endotracheal tube balloon during intraoperative period on intraocular pressure (IOP) and hemodynamics.

Study Design: A Randomize Control Trial.

Place and Study Duration: This study was conducted at the Department of Anaesthesia and Intensive Care, Hameed Latif Hospital, Lahore from 05 May 2016 to 04 April 2017.

Materials and Methods: After obtaining ethical approval from hospital ethical board and informed consent from patients regarding inclusion in clinical trial. Total 100 Patient were enrolled in study through non probability consecutive sampling and divided in two equal groups randomly by using lottery method. Data was collected by using preformed Performa and analyzed with SPSS 23. Quantitative continuous data was presented as mean and standard deviation age and IOP. Qualitative data was presented as numbers and percentages like gender. Student t-test and chi-square test was applied to see significance of variables. P value 0.05 was taken as significant.

Results: Number of 100 patients were enrolled in this study, both genders. The patients were further divided into two equal group 50% (n=50) in each i.e. control and lidocaine. Mean IOP 2 min before intubation, IOP 2 min after intubation, IOP 5 min after intubation and IOP 10 min after intubation of the control patients was 10.80 ± 3.48 minutes, 13.36 ± 3.50 minutes, 13.04 ± 2.09 minutes and 10.30 ± 2.32 minutes respectively. While, The mean IOP 2 min before intubation, IOP 2 min after intubation, IOP 5 min after intubation and IOP 10 min after intubation lidocaine patients was 13.12 ± 2.12 minutes, 17.74 ± 1.92 minutes, 15.44 ± 1.96 minutes and 13.54 ± 3.01 minutes respectively. The differences were statistically significant.

Conclusion: The observations of our study revealed that the use of Lidocaine into the endotracheal tube balloon gives better hemodynamic control and intraocular pressure maintenance. And attenuate presser response due intubation.

Key Words: Endotracheal Tube, Lidocaine, Intubation, Intraocular Pressure

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INTRODUCTION

Raised intra ocular pressure (IOP) is an alarming sign for healthy and normal eyes similar increase in injured or traumatic eye is dangerous which can lead to blindness¹. It is necessary to maintain intra ocular pressure at its normal level or below the normal given level. During intubation and extubation of endotracheal tube stress response activates the sympathetic system which increased the IOP^{2,3}. Number of sensory receptors is located on lower portion of pharynx, epiglottis and larynx that respond to different type of

thermal, chemical and mechanical stimuli received in different cases⁴. Among these mechanoreceptors are abundantly found in epiglottis lower portion of pharyngeal wall and on vocal cords⁵. Activation of these receptors at the time of intubation and extubation produce several body responses such as cough and hiccups due to reflux motor response⁶, cardiovascular presser response due to activation of sympathetic reflex and also release of catecholamines from adrenal medulla into blood pressure stream (circulation)⁷. This adrenergic outflow is responsible for tachycardia, vasoconstriction and raised central venous pressure. These all pressures and their increase have close relationship with IOP in comparison with systemic pressure⁸.

This whole mechanism enhances the outflow resistance of aqueous humor in mesh work of trabecular which located between Schlemm's canal that can increase the IOP⁹. To overcome this situation more experienced hands for intubation and extubation are needed,

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intubation procedure is well studied and improved but extubation is not¹⁰. It is a well known fact that short time period after extubation can cause aspiration, laryngeospasm, ineffective pulmonary massage and short opening can cause raised in IOP. Patients of coronary artery disease may develop myocardial ischemia. In this aspect drugs (atropine, epinephrine, lidocaine and naloxone) can be administered through endotracheal tube where they absorb more rapidly due to excessive blood supply¹¹. It is necessary to avoid these complications by control of IOP¹². Aim of our study is to examine the effect of lidocaine administration into endotracheal tube to overcome the increase in IOP.

MATERIALS AND METHODS

Study was conducted in Hameed Latif Hospital, Lahore from 05 May 2016 to 04 April 2017, after ethical approval from hospital ethical board and obtaining detailed consent after information about study purpose and procedure. Study was conducted on 100 patients of either gender and ASA status I and II. Patients were between age of 20 to 40 years who were selected for any ophthalmic surgery (squint, position and cataract). Non probability consecutive sampling technique was used and sample size was calculated by using 95 percent confidence interval 80% and P1 (IOP 2 minutes before surgery in case group 11.10 ± 1.7611) P2 (IOP 2 minutes before surgery in control group 11.56 ± 1.4012) and patients were divided into two groups, 50 patients in each group. Patients of hypertension, glaucoma, difficult airway, diabetes and obesity were excluded from the study. Patients were monitored for Noninvasive pulse oximetry, tidal volume, two large bore cannulas were inserted on both limbs in operative room and 1.0 micrograms per kg fentanyl was given. Propofol was given with dose of 1 to 2 mg per kg for induction and neuromuscular blocker atracurium bromide was given 0.5 mg per kg. Before insertion of endotracheal tube patients were ventilated with 100% oxygen and sevoflurane for three minutes. Patients were intubated with standard size endotracheal tube. After confirmation of proper placement balloon of endotracheal tube was inflated with 2% Lidocaine solution and fixed for Lidocaine Group and Normal saline was used to inflate the balloon of endotracheal tube for control group, endotracheal tube was connected to ventilator on positive intermittent mandatory ventilation mode. Anesthesia was maintained using atracurium and sevoflurane. Non operated eye was used measure IOP. Intra ocular pressure was measured before 2 min of intubation and then measured at two minutes, five minutes and ten minutes duration with tonometer (schiotz tonometer). All hemodynamic parameters blood pressure systolic and diastolic, heart rate and IOP was measured and recorded.

Patient's data was analyzed with statistical package for social sciences. Quantitative continuous data was presented as mean and standard deviation age and IOP. Qualitative data was presented as numbers and percentages like gender. Student t-test and chi-square test was applied to see significance of variables. P value 0.05 was taken as significant.

RESULTS

Overall, 100% (n=100) patients were enrolled in this study, both genders. The patients were further divided into two equal groups 50% (n=50) in each i.e. control and lidocaine. The mean age, weight and operative time of the controls was 28.12 ± 2.68 years, 63.88 ± 3.11 kg and 45.18 ± 3.24 minutes respectively. There were 70% (n=35) males and 30% (n=15) females. While, the mean age, weight and operative time of the lidocaine patients was 28.02 ± 2.69 years, 64.08 ± 3.31 kg and 49.58 ± 2.16 minutes respectively. There were 70% (n=35) males and 30% (n=15) females. ASA I and II was observed as 80% (n=40) and 20% (n=10) respectively in controls. While, ASA I and II was observed as 56% (n=28) and 44% (n=22) respectively in lidocaine patients. Operative type distribution noted cataract, ptosis and squint as 36% (n=18), 42% (n=21) and 22% (n=11) respectively, in controls. While, in lidocaine patients, operative type distribution noted cataract, ptosis and squint as 42% (n=21), 36% (n=18) and 22% (n=11) respectively. The differences were statistically insignificant except ASA (p=0.010) and operative time (p=0.000). (Table. 1).

Table No.1: Demographic characteristics among the study groups

Variables	Control (n=50)	Lidocaine (n=50)	Test of Sig.
Age (years)	28.12 ± 2.68	28.02 ± 2.69	t=0.186, p=0.853
Gender	M=70%, F=30%	M=70%, F=30%	$\chi^2=0.00$, p=1.0
Weight (kg)	63.88 ± 3.11	64.08 ± 3.31	t=-0.311, p=0.757
ASA (I/II)	I=80% (n=40), II=20% (n=10)	I=56% (n=28), II=44% (n=22)	$\chi^2=6.61$, p=0.010
Operative time (min)	45.18 ± 3.24	49.58 ± 2.16	t=-0.7.97, p=0.000
Operative type (cataract ptosis/squint)	36% (n=18)/ 42% (n=21)/ 22% (n=11)	42% (n=21)/ 36% (n=18)/ 22% (n=11)	$\chi^2=0.462$, p=0.794

The mean SBP 2 min before intubation, SBP 2 min after intubation, SBP 5 min after intubation, SBP 10

min after intubation, DBP 2 min before intubation, DBP 2 min after intubation and DBP 5 min after intubation of the control patients was 112.88 ± 5.45 minutes, 131.76 ± 2.45 minutes, 114.38 ± 3.19 minutes, 111.66 ± 3.75 minutes, 69.16 ± 3.18 minutes, 74.90 ± 2.03 minutes, 71.22 ± 2.39 minutes, 67.86 ± 3.31 minutes respectively.

Table No. 2: Comparison of hemodynamic changes before and after tracheal extubation among the study groups

Variables	Control (n=50)	Lidocaine (n=50)	Test of Sig.
SBP 2 min before intubation	112.88 ± 5.45	112.50 ± 4.22	$t=0.386$, $p=0.698$
SBP 2 min after intubation	131.76 ± 2.45	118.36 ± 2.19	$t=28.79$, $p=0.000$
SBP 5 min after intubation	114.38 ± 3.19	113.38 ± 3.65	$t=1.45$, $p=0.148$
SBP 10 min after intubation	111.66 ± 3.75	110.28 ± 4.39	$t=1.68$, $p=0.095$
DBP 2 min before intubation	69.16 ± 3.18	65.58 ± 2.57	$t=6.18$, $p=0.000$
DBP 2 min after intubation	74.90 ± 2.03	68.72 ± 3.18	$t=11.55$, $p=0.000$
DBP 5 min after intubation	71.22 ± 2.39	66.22 ± 1.98	$t=11.37$, $p=0.000$
DBP 10 min after intubation	67.86 ± 3.31	63.48 ± 3.86	$t=6.08$, $p=0.000$
HR 2 min before intubation	80.80 ± 2.05	76.80 ± 1.64	$t=10.76$, $p=0.000$
HR 2 min after intubation	85.22 ± 2.36	81.94 ± 3.49	$t=5.49$, $p=0.000$
HR 5 min after intubation	80.86 ± 3.11	76.26 ± 1.99	$t=8.78$, $p=0.000$
HR 10 min after intubation	83.40 ± 3.60	77.90 ± 3.22	$t=8.04$, $p=0.000$

While, the mean SBP 2 min before intubation, SBP 2 min after intubation, SBP 5 min after intubation, SBP 10 min after intubation, DBP 2 min before intubation, DBP 2 min after intubation and DBP 5 min after intubation in lidocaine patients was 112.50 ± 4.22 minutes, 118.36 ± 2.19 minutes, 113.38 ± 3.65 minutes,

110.28 ± 4.39 minutes, 65.58 ± 2.57 minutes, 68.72 ± 3.18 minutes, 66.22 ± 1.98 minutes, 63.48 ± 3.86 minutes respectively. The differences were statistically significant except SBP 2 min before intubation ($p=0.698$), SBP 5 min after intubation ($p=0.148$) and SBP 10 min after intubation ($p=0.095$). (Table. 2).

Table No.3: Comparison of intraocular pressure changes before and after tracheal extubation among the study groups

Parameters	Control (n=50)	Lidocaine (n=50)	Test of Sig.
IOP 2 min before intubation	10.80 ± 3.48	13.12 ± 2.12	$t=-4.01$, $p=0.000$
IOP 2 min after intubation	13.36 ± 3.50	17.74 ± 1.92	$t=-7.73$, $p=0.000$
IOP 5 min after intubation	13.04 ± 2.09	15.44 ± 1.96	$t=-5.91$, $p=0.000$
IOP 10 min after intubation	10.30 ± 2.32	13.54 ± 3.01	$t=-6.02$, $p=0.000$

The mean HR 2 min before intubation, HR 2 min after intubation, HR 5 min after intubation and HR 10 min after intubation of the control patients was 80.80 ± 2.05 minutes, 85.22 ± 2.36 minutes, 80.86 ± 3.11 minutes and 83.40 ± 3.60 minutes respectively. While, the mean HR 2 min before intubation, HR 2 min after intubation, HR 5 min after intubation and HR 10 min after intubation lidocaine patients was 76.80 ± 1.64 minutes, 81.94 ± 3.49 minutes, 76.26 ± 1.99 minutes and 77.90 ± 3.22 minutes respectively. The differences were statistically significant. (Table. 2).

The mean IOP 2 min before intubation, IOP 2 min after intubation, IOP 5 min after intubation and IOP 10 min after intubation of the control patients was 10.80 ± 3.48 minutes, 13.36 ± 3.50 minutes, 13.04 ± 2.09 minutes and 10.30 ± 2.32 minutes respectively. While, The mean IOP 2 min before intubation, IOP 2 min after intubation, IOP 5 min after intubation and IOP 10 min after intubation lidocaine patients was 13.12 ± 2.12 minutes, 17.74 ± 1.92 minutes, 15.44 ± 1.96 minutes and 13.54 ± 3.01 minutes respectively. The differences were statistically significant. (Table 3).

DISCUSSION

It is necessity to avoid increase of IOP in perioperative and post-operative time to limit the complications and its dangerous effects (vitreous humor expulsion). Most important thing in this aspect is choice if anesthetic agent. In our study we use non operated eye instead of operated eye to minimize the bias. We include patients of 18 to 40 years as hypothesized that airway reflexes are associated with age¹³. In our study we found

remarkable decrease in mean IOP in case group as compared control group.

In a study conducted by Hassaneina A ¹⁴ concluded the similar results that use of Lidocain 2% instillation five minutes before end of surgery is an effective method which reduce the incidence of raised IOP with complete hemodynamic stability both during and after extubation. This study is identical to our study and can be compared with our results. In another study Bidwaskiet al¹⁵ use similar variables and evaluate role of lidocaine instillation in endotracheal tube to reduce IOP and found that use of 2% lidocaine in tube reduce the laryngeospasm and laryngeal reflux. But intravenous lidocaine is not inferior to that technique both are equally effective.

Another study was conducted by Gefkeet al¹⁶ in 1983 and reported significant decrease in HR values. He also observed that there was not any difference in anesthesia duration and dizziness in both groups (Lidocain group and placebo group). SBP in his study was also significantly lower in lidocaine group at 2 min before extubation. This study is also comparable with our finding as in our study HR is lower in lidocaine group as compared placebo.

In a study Ebrahim N et al¹⁷ also observed that at the time intubation and extubation IOP raised to a significant level, its peak value were at the one minute after intubation and extubation. Furthermore IOP was higher at extubation as compared to intubation. It takes about 10 minutes to return at baseline values. This study can be compared with our study.

In another study conducted by Pandya Malti J et al¹⁸ was compared laryngeal mask airway and endotracheal for the evaluation of IOP. He reported that endotracheal extubation is the cause of increase in IOP and that can be controlled with use of lidocaine in endotracheal tube which has significance reduction in IOP and its side effects. Findings of this are study also similar our study. In a study by Tavakkolet al¹⁹ use 5 ml of 2% lidocaine in endotracheal tube and compared number of coughs and laryngeospasm with placebo. Observations of his study revealed that number coughs and incidence of laryngeospasm is much lower in case (lidocaine) group as compared to control (placebo) group. This study is also strengthen our study as its results identical to our results.

CONCLUSION

The observations of our study revealed that the use of Lidocaine into the endotracheal tube balloon give better hemodynamic control and intraocular pressure. And attenuate presser response due intubation.

Author's Contribution:

Concept & Design of Study: Sabir Khan
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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Association High Sensitivity C-Reactive Protein with Systolic Blood Pressure and Hypertension in Middle Aged Coronary Heart Diseased Patients

Nadia Haleem¹, Afsheen Siddiqi² and Shazia Tauqir³

ABSTRACT

Objective: To find a correlation and relationship of c reactive protein with systolic blood pressure and hypertension in middle aged coronary heart diseased individuals.

Study Design: Cross sectional study.

Place and Duration of Study: This study was conducted at the Department of Biochemistry, Khybar Medical University, Peshawar from Feb. 2011 to Feb. 2013.

Materials and Methods: This is across sectional study in which two groups of age group 40-60 were taken whose serum C-reactive protein as well as two readings of their systolic blood pressures were taken. Data was collected and analyzed properly by SPSS version -15.

Results: It was found that C-reactive protein is strongly associated with systolic blood pressure. P value was 0.001 which is found to be highly significant.

Conclusion: It was concluded that serum C-reactive protein is strongly associated with systolic blood pressure and hypertension but whether a causal link exist is uncertain.

Key Words: Systolic blood pressure, C reactive protein, coronary heart disease

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INTRODUCTION

Coronary heart disease is the major contributor and is the multifactorial inflammatory process in which there is accumulation of lipid macrophages and smooth muscle cells found in the form of intimal plaques present in medium and large sized coronary arteries.¹ The major cause of coronary heart disease is atherosclerosis.² Atherosclerosis is defined as "imbalance between the oxygen supply to the heart muscle and myocardial demand". So coronary atheroma is formed which may cause the obstruction of coronary blood flow.³ Cardiovascular heart disease is responsible for 500,000 deaths per year in united states i.e global cause of death in united states and in many other parts of the world and may result in loss of productivity and gross disability.⁴ There are hundreds of putative risk factors involved in causation of coronary heart disease that may be biochemical behavioral or genetic markers but in addition to all inflammatory markers have very significant role in causation and progression of coronary heart disease⁵.

One of the most important risk factor which may cause coronary heart disease is hypertension. High sodium intake is basically linked to hypertension, CHD and then finally death of individuals. General and current recommendation for the consumption of salt for general population is less than 5-6gm of salt/daily (i.e equivalent of 2000-2400mg of Na)⁶. Hypertension is defined as "blood pressure greater than or equal to 140/90 mmHg. There is a very strong, graded relationship between fatal coronary disease and hypertension. Risk may increases and doubles for every 20mmHg increase of systolic blood pressure or increased 10mmHg in diastolic blood pressure. There are various mechanisms by which high coronary events that may include hemodynamic stress on blood vessels and heart, increased myocardial oxygen demand which impaired and diminished coronary blood flow and endothelial functions. Reduction in cardiovascular mortality and morbidity in several trials shown by reducing in blood pressure⁷. According to a research association of illness is highly correlated with adherence to pharmacological treatment.⁸ One of the other reversible risk factor which may be considered as inflammatory marker is C reactive protein. CRP is an important marker of systemic inflammation and this has been postulated to increase the risk of hypertension development⁹. C reactive protein is defined as "acute phase protein or reactant synthesized in the hepatic cells of liver, that is responsible to promote

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inflammation". It is regulated by cytokines (interleukin 1, 6 and tumor necrotic factor) and considered to be a golden marker of inflammation.¹⁰

MATERIALS AND METHODS

This proposed and selected cross sectional study was carried out in tertiary care hospital of Peshawar. Two groups were selected and studied thoroughly. The research and analytical work was carried out in well equipped and advanced laboratory of institute of basic medical sciences KMU. The group A have confirmed coronary heart diseased patients and group 2 were those who are free of coronary events i.e controls. Both groups are middle aged individuals i.e 40-60 years and sample size was 150. The study received clearance from hospital ethical review committee. Aims and objectives were briefly explained to both groups and patient history was recorded according to well defined and well designed questionnaire. Consent of both groups was taken. After completion of field work, specimen collection and preparation was done.

Two biochemical parameters i.e serum high sensitivity CRP and blood pressure of two groups were taken. Measurement of systolic and diastolic blood pressure of both groups with standardized methods i.e with standard mercury sphygmomanometer and standard arm cuff at right arm was taken properly. Subjects were in sitting position and mentally and physically relaxed. At least two readings were taken at 5 minutes interval and then took their mean. The determination of serum high sensitivity CRP is done by two clia strip reader (model- 4100) machine in research laboratory of IBMS Peshawar using the immunoenzymometric chemiluminescence assay. The specimen of about 5ml of blood into the vacutainer tube which donot contain coagulant collected. The specimen centrifuged in centrifuge machine to get serum and refrigerated at 2-8°C for 5 days. labell the sample properly and serum CRP analysis done. The sensitive mathadologies for assays are used in routine way. CRP calibrator and patient and control specimen added and mixed to treptavidin coated well. Biotinylated monoclonal and enzyme labeled antibodies are also added and mixed. The reaction takes place between various antibodies of CRP and native CRP. Finally we get sandwich complex. The complex then unite with streptavidin coated to well. After conjugation period completes the enzyme CRP antibody bound conjugate is separated from the unbound enzyme. The activity of enzyme is quantitated with a suitable substrate to produce light.

RESULTS

In this cross sectional study the two groups i.e 100 cases of coronary heart disease and 50 controls without evidence of coronary heart disease. Both were of middle aged groups. We took two parameters i.e to find the correlation and significant association of of serum CRP and blood pressure of two groups. By using the

pearson product moment correlation on SPPSS version 15, we found the coefficient of correlation "r" of biochemical variables i.e blood pressure and CRP. The magnitude of alteration of one value changes in the other is determined by value "r". positive and negative correlation are two types of correlation. Correlation is shown by scatter diagram. Linear correlation of mean systolic blood pressure and serum CRP of coronary heart disease and controls shows the positive correlation i.e these two variables vary steadily in same direction, correlation is direct so it is positive. The independent variable taken on x-axis (blood pressure) and dependent (serum CRP) taken on Y axis. The significant association between mean systolic blood pressure with high sensitivity C reactive protein in middle aged coronary heart diseased patients were found.

Table No.1: Mean values of study groups including coronary heart disease patients and control group.

Variables	Patients (N= 100) Mean SEM	Controls (N= 50) Mean SEM	Overall (N= 150) Mean SEM
Systolic Blood Pressure			
SBP1	159.65± 2.582	119.90 ±2.288	146.40 ±29.708
SBP2	142.65± 2.468	118.20 ±1.095	134.50 ±23.68
Mean SBP	146.65 ±2.146	117.84 ±1.079	136.82 ±24.25

Table No.2: Correlation and significance levels of CRP with systolic blood pressure in coronary heart disease and normal subjects.

Y-axis vs X- axis		C0-efficient of correlation r	P value of r
CRP	Mean BP (systolic)	0.336	0.001
CRP	Mean SBP(Above 140)	0.255	0.04

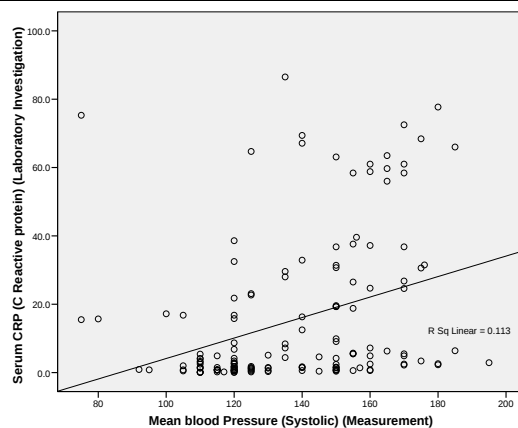


Figure 1: Linear correlation and significance of mean systolic blood pressure and serum CRP of coronary heart disease and controls.

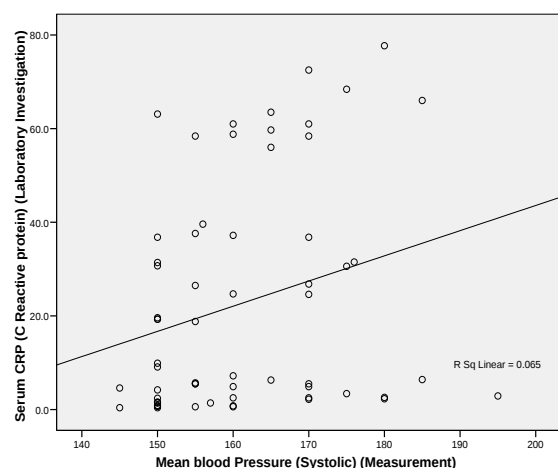


Figure No.2: Linear correlation and significance of mean systolic blood pressure above 140 and serum CRP of coronary heart disease and controls.

DISCUSSION

The most common and prevalent cause of the coronary heart disease is the atherosclerosis.¹¹ In industrialized world and developed countries the coronary heart events and disorders are considered to be most common cause of morbidity and death. A total of three quarters of million deaths in united states, basically more or less than 40% of these deaths are due cardiovascular events.

¹² In united states the prevalence of coronary heart disease, the mortality rate is declining steadily as age adjusted since 1960.¹³ There are multiple factors which may be involved in declining or controlling the coronary heart disease deaths including the greater control of risk factors and improved treatment.¹⁴ In study done by George davey in 2005, which shows a positive association of c reactive protein with blood pressure and hypertension. Basically 4286 women of age 60-79 were selected from British towns. Women taking warfarin were excluded. They found positive linear association between CRP and systolic blood pressure, pulse pressure and hypertension.¹⁵ Another study done by bautista et al in 2004, also shows association between c- reactive protein and hypertension healthy middle aged men and women. This is a case control study among 904 participants, 39-50 years of age, participants with systolic blood pressure ≥ 140 mmhg or diastolic blood pressure ≥ 90 mmhg (n=120) were case participants and other be controls (n=784). At 95% confidence interval systolic pressure increased 1.17 mmhg and diastolic blood pressure 1.04 mmhg. the prevalence of hypertension was 13.3 % and increased with CRP exposure., showing the highest CRP quintile were 2.35 times more likely to have hypertension than lower quantile. (p=0.03).¹⁶ In study done by chuang sy in which he concluded that inflammation is associated with future systolic blood pressure in taiwanese population. A study population

sample recruited in cycle 2 of coronary heart disease risk factors. A study followed to 1994-1997. About 2113 nondiabetic individuals with normal BP were selected. with systolic blood pressure and pulse pressure, but not with diastolic blood pressure.¹⁷ In another study done by Perrault et al, the estimated death rate from coronary events and disorders was found to be 4-5 times greater in individuals among the females having no hypertension. Similar to the case of males, the predicted reduced baseline risk of death from coronary heart events following hypertension treatment among those women who were hypertensive declined from 20% to 12% between 35-54 and 65-74 years of age. The predicted reduction of risk with lipid therapy decreased from 20% to 8% between two groups. So in this study it was presumed that increased and higher risk among treated hypertensive people may be due to deficient control of other risk factors.¹⁸ In our study in which we found the correlation and association of serum C-reactive protein with mean systolic blood pressure and hypertension. The p value was found to be 0.001 between mean systolic blood pressure and serum c reactive protein in coronary heart diseased patients of age group 40-60 years (middle age group individuals) which was found to be highly significant. We also correlate the association of mean systolic blood pressure above 140 and c reactive protein (p= 0.04), which also found to be significant. Different treatment regimens like beta blockers, calcium channel blockers and combined alpha and beta blockers and clonidine are very effective in treating hypertension.¹⁹ Secondly low dose antihypertensive drug therapy is also effective for prevention of hypertension and was recently shown to beneficially impact left ventricular mass.²⁰

In our study we concluded that c reactive protein which is a golden marker of coronary heart disease showing strong association with one of another modifiable risk factor of coronary event i.e systolic blood pressure. These are interrelated to each other. This study will probably helps us to some extent that by controlling the inflammatory risk factor i.e serum Creactive protein will decreases the events of hypertension in coronary heart diseased individuals. We must change our life styles like by discouraging the sedentary life and encouraging the exercise habits to prevent the disease.

CONCLUSION

It was concluded that serum C-reactive protein is strongly associated with systolic blood pressure and hypertension but whether a causal link exist is uncertain.

Author's Contribution:

Concept & Design of Study:	Nadia Haleem
Drafting:	Nadia Haleem
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Revisiting Critically: Nadia Haleem
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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Comparing the Hemodynamic Changes When Supraglottic Airway Devices Inserted with Propofol VS Sevoflurane During Short Surgical Procedures

Muhammad Zuhaib, Munir Ahmad, Hammad Rafiq and Aamir Furqan

ABSTRACT

Objective: To compare the hemodynamic changes when supraglottic airway devices are inserted with propofol versus sevoflurane during short surgical procedures.

Study Design: Our study is randomized controlled trial. Non-consecutive sampling technique was used to select a total of 54 patients.

Place and Duration of Study: This study was conducted at the Department of Anaesthesia, Nishtar Hospital, Multan from 15 March 2017 to 15 December 2017.

Materials and Methods: All the patients were randomly divided into two equal groups, one for propofol, Group-P and the other for sevoflurane, Group-S. Age, weight and height were documented. Electrocardiogram and non-invasive blood pressure monitors were used. After preparation, 2.5 mg/kg body weight of propofol was given to group-P, and a mixture of 8% sevoflurane in 8L/min flow rate of oxygen was used in Group-S. After evaluating the jaw relaxation, supraglottic airway devices were inserted. Pulse rate and mean arterial pressure were recorded before anesthesia, after inducing anesthesia, and at 0, 5 and 10 minutes after insertion of supraglottic device. Means were calculated and compared by applying the one way ANOVA, using SPSS v.23 software to analyze the data, considering $p \leq 0.05$ significant.

Results: In group-P and group-S, baseline pulse rate was $81.55 \pm 3.33/\text{min}$ and $89.48 \pm 4.34/\text{min}$ ($p=0.000$) at 5 minutes and $81.96 \pm 3.75/\text{min}$ and $85.00 \pm 3.11/\text{min}$ ($p=0.002$) at 10 minutes; and mean arterial pressure was $79.26 \pm 3.98 \text{ mmHg}$ and $86.02 \pm 2.63 \text{ mmHg}$ ($p=0.000$) at five minutes and $84.11 \pm 2.95 \text{ mmHg}$ and $87.01 \pm 2.62 \text{ mmHg}$ ($p=0.000$) at 10 minutes after insertion of supraglottic device, respectively. These differences were statistically significant in both groups.

Conclusion: It is concluded sevoflurane is a better agent as compared to propofol, in terms of stabilizing hemodynamics, for inducing anesthesia when supraglottic airway device is to be inserted.

Key Words: Hemodynamics, Propofol, Sevoflurane, Supraglottic Devices, Mean Arterial Pressure

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INTRODUCTION

Propofol is an intravenous anesthetic agent. It is used widely in surgical procedures because it results in good recovery from anesthesia and very few side effects⁽¹⁾. Propofol anesthesia is associated with significant decrease in heart rate and mean arterial pressure⁽²⁾. Decrease in cardiac contractility, suppression of baroreflex response system and arterio-venous vasodilation all combined result in reduced vascular resistance and cardiac output and contribute to the hypotensive characteristics of propofol⁽³⁾⁽⁴⁾.

Although the exact mechanism is not yet known, most of the propofol induced changes in the hemodynamics can be explained by the weakened sympathetic activity. On the contrary, lessened sympathetic response of heart due to propofol should result in decreased heart rate. Significant reduction in blood pressure and peripheral sympathetic activity has been caused by propofol anesthesia while the heart rate was high⁽⁵⁾. Anticholinergic prophylaxis has failed to avoid propofol-induced bradycardia as well asystole in healthy and adult patients. This reveals that the cardiac and peripheral autonomic activity is affected in a different way by propofol.

Sevoflurane is used for inducing and maintaining general anesthesia over a large scale. It is a volatile ether which has a high composition of fluorine gas. It is an aromatic and fire resistant agent⁽⁶⁾. Quick generation and appearance and rapid control of depth of anesthesia are the most wanted properties of sevoflurane. It decreases sympathetic nervous system

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activity and contractility of heart but there is mild or no effect on peripheral neuronal activity^{(7) (8)}. Ephedrine activates the sympathetic nervous system and increases heart rate. When anesthesia was induced with sevoflurane, is abolished the effects of ephedrine. His suggests that that sevoflurane suppresses the cardiac baroreflex response by blocking the efferent activity of vagus nerve. Block of peripheral autonomic neuronal activity causes a drop in blood pressure but simultaneous suppression of efferent vagal activity prevents the heart rate from rising in response to systemic hypotension.

Supraglottic airway devices are valuable for managing the common and problematic airways⁽⁹⁾. Classic type of laryngeal mask airway was introduced in 1980; and since then, the incidence of supraglottic airway devices use has been on the constant rise. Almost 56% of the general anesthesia procedures are managed by the use of such devices in UK. Both disposable and reusable forms of supraglottic airway devices are available for use. Different sizes of supraglottic airway devices are being manufactured keeping in view the patients' weight. Many types of supraglottic airway devices are available including classic laryngeal mask airway, laryngeal mask airway unique, laryngeal mask airway flexible, intubating laryngeal mask airway, laryngeal mask airway proseal, laryngeal mask airway supreme, combitube, i-gel, baska mask, 3gLM and SLIPA etc.⁽¹⁰⁾. When supraglottic airway devices are inserted, the pressure applied on the oral and pharyngeal mucosa is transmitted via glossopharyngeal, vagus and trigeminal nerve towards the vasomotor center of the brain and in response, sympatho-adrenal system is activated and catecholamines are released which cause an increase in heart rate, mean arterial pressure and consequently, the cardiac output⁽¹¹⁾.

As it is known that the supraglottic airway device insertion triggers sympathetic response whereas propofol and sevoflurane suppress the sympathetic cardiac responses to some extent. There is need to perform study about which one of propofol and sevoflurane attenuates the sympathetic activation -after supraglottic device insertion- in a better way. Or both of these drugs have equal effect on hemodynamics when supraglottic devices are inserted after inducing anesthesia with any of these agents.

MATERIALS AND METHODS

Our study was randomized controlled trial. Fifty four patients were selected using non-probability consecutive sampling technique; and the sample size was calculated using the study by Chavan SG et al.⁽¹²⁾ as reference. This study was conducted over a time period from 15 March 2017 to 15 December 2017 in Departments of Anaesthesia, Nishtar Hospital, Multan. The consent was taken from the ethical committee of the Department.

All the patients were randomly divided into two equal groups, one for propofol, Group-P and the other for sevoflurane, Group-S. Informed consent was taken from each patient in written form. A pre-anesthetic assessment was done. After taking the patients to the operation theatre, intravenous wide bore lines were secured in the basilic and cephalic veins. Electrocardiogram and non-invasive blood pressure monitors were attached. Prior to anesthesia, ondansetron 4 mg and glycopyrrolate 0.2 mg were injected to all the patients and oxygenation was done with 100% oxygen at a flow rate of 8 liter per minute for at least 4 minutes. After that, injection fentanyl 2 mcg/kg and injection midazolam 1 mg were given and baseline pulse rate and mean arterial pressure were recorded. 2.5 mg/kg body weight of propofol was given to group-P, at a 40 mg per 10 sec rate. A mixture of 8% sevoflurane in 8 liter per minute flow rate of oxygen was used to induce anesthesia in Group-S. After assessing the jaw relaxation, supraglottic airway devices were inserted.

All the patients who did not consent, or suffered from ischemic heart disease, congestive heart failure, diabetes mellitus, any other disorder disturbing autonomic nervous system; and those taking medication that could affect the cardiovascular system, needing endotracheal intubation, undergoing head, neck or face procedures and the procedures which require muscle relaxation, were excluded from our study.

Age, weight and height was recorded and their means were compared. Pulse rate and mean arterial pressure were recorded before inducing anesthesia, just after inducing anesthesia and at 0, 5 and 10 minutes after insertion of supraglottic airway device. The data was entered on a pre-formed Performa. Their means were calculated and compared by applying the one way ANOVA test, using SPSS v.23 software to analyze the data. A value of p was considered significant if it was ≤ 0.05

RESULTS

A total of 54 patients were included in our study. All the patients were divided into two equal groups; group-P was anesthetized with propofol and group-S with sevoflurane. Mean age, weight and height of group-P were 36.33 ± 4.10 years, 53.78 ± 3.91 kg and 160.00 ± 4.94 cm; and of group-S were 36.67 ± 4.50 years, 54.78 ± 4.04 kg and 159.37 ± 5.48 cm, respectively. (Table-1)

In group-P and group-S, baseline pulse rate was 80.48 ± 4.34 /min and 80.48 ± 4.34 /min ($p=0.663$); after induction of anesthesia, 88.52 ± 4.34 /min and 84.25 ± 3.98 /min ($p=0.000$); and after insertion of supraglottic airway device at 0 min, 88.74 ± 3.97 /min and 88.78 ± 4.04 /min ($p=0.973$); at 5 min, 81.55 ± 3.33 /min and 89.48 ± 4.34 /min ($p=0.000$); at 10 min, 81.96 ± 3.75 /min and 85.00 ± 3.11 /min ($p=0.002$), respectively. (Table-2)

In group-P and group-S, baseline mean arterial pressure was 94.11 ± 5.20 mmHg and 95.63 ± 3.36 mmHg ($p=0.209$); after induction of anesthesia, 91.29 ± 4.17 mmHg and 90.11 ± 2.81 mmHg ($p=0.226$); and after insertion of supraglottic airway device at 0 min, 86.30 ± 4.17 mmHg and 87.00 ± 2.63 mmHg ($p=0.462$); at 5 min, 79.26 ± 3.98 mmHg and 86.02 ± 2.63 mmHg ($p=0.000$); at 10 min, 84.11 ± 2.95 mmHg and 87.01 ± 2.62 mmHg ($p=0.000$), respectively. (Table-3)

Table No.1: Demographic Characteristics

Variable	Group-P	Group-S
Age (years)	36.33 ± 4.10	36.67 ± 4.50
Weight (kg)	53.78 ± 3.91	54.78 ± 4.04
Height (cm)	160.00 ± 4.94	159.37 ± 5.48

Values are mean $\pm$ S.D

Table No.2: Pulse rate (beats/min)

Study Parameter	Group-P	Group-S	Test of Significance	
Baseline Pulse Rate	80.48 ± 4.34	80.48 ± 4.34	F=0.193	p=0.663
After Induction	88.52 ± 4.34	84.25 ± 3.98	F=14.12	p=0.000
At 0 min after Insertion	88.74 ± 3.97	88.78 ± 4.04	F=0.001	p=0.973
At 5 min	81.55 ± 3.33	89.48 ± 4.34	F=56.58	p=0.000
At 10 min	81.96 ± 3.75	85.00 ± 3.11	F=10.49	p=0.002

Values are Mean $\pm$ S.D; $P \leq 0.05$ is significant

Table No.3: Mean Arterial Pressure (mmHg)

Study Parameter	Group-P	Group-S	Test of Significance	
Baseline MAP	94.11 ± 5.20	95.63 ± 3.36	F=1.620	p=0.209
After Induction	91.29 ± 4.17	90.11 ± 2.81	F=1.502	p=0.226
At 0 min after Insertion	86.30 ± 4.17	87.00 ± 2.63	F=0.550	p=0.462
At 5 min	79.26 ± 3.98	86.02 ± 2.63	F=53.95	p=0.000
At 10 min	84.11 ± 2.95	87.01 ± 2.62	F=14.40	p=0.000

Values are Mean $\pm$ S.D; $P \leq 0.05$ is significant

DISCUSSION

Current study shows that inserting supraglottic airway devices resulted in sudden rise of pulse rate in both group-P and group-S but there was a significant difference in group-P at 5 and 10 minutes after the insertion of device. Similarly, mean arterial pressure was relatively much stable in group-S as compared to the readings in group-P. Just after the insertion of the device, there was no significantly different affect on

pulse rate and mean arterial pressure in both the groups. Pulse rate and mean arterial pressure were relatively stable in group-S but the differences were statistically significant in group-P.

Chavan SG et al. ⁽¹²⁾ concluded in their study that sevoflurane was a better agent, in terms of effect over hemodynamics, for inducing anesthesia when supraglottic airway device was to be inserted. Propofol maybe the better agent in term of ease of insertion of device but not better in terms of stability of hemodynamics. In a study conducted by Hosseinzadeh H. et al. ⁽¹³⁾ in 2013, propofol resulted in hemodynamic instability and there were some undesired results in the form of decreased heart rate and low mean arterial pressure; and it was shown that propofol anesthesia was not associated with desirable results when supraglottic device was inserted.

A study by Erdogan MA et al. ⁽¹⁴⁾ disclosed that when patients were anesthetized with propofol and laryngeal mask airway was inserted, many patients required ephedrine to stabilize their hemodynamic status. Some patients even required higher doses of ephedrine. Ghafoor HB et al. ⁽¹⁵⁾ have established in their study that laryngeal mask airway insertion with propofol is coupled with hemodynamic instability and requires other measures to prevent adverse outcomes. According to study by Kanazawa M. et al. ⁽¹⁶⁾, clinical doses of propofol was unable to prevent the effects of supraglottic device insertion. Rather, drug like fentanyl was required to stabilize these effects.

Shao G. et al. ⁽¹⁷⁾, after conducting a study, came to a conclusion that that laryngeal mask airway insertion with propofol resulted in hypotension as compared to which, sevoflurane provided better control of hemodynamic stability, especially in elderly patients who have cardiovascular compromise. According to Topuz D. et al. ⁽¹⁸⁾, laryngeal mask airway insertion with sevoflurane anesthesia resulted in minimal change in hemodynamics as compared to propofol induction. So, sevoflurane appears to be a better alternative to propofol for supraglottic device insertion.

CONCLUSION

Current study reveals that sevoflurane was a better agent as compared to propofol, in terms of effect over hemodynamics, for inducing anesthesia when supraglottic airway device was to be inserted. It stabilizes the pulse rate as well as mean arterial pressure. On the other hand, propofol does not keeps the hemodynamics stable after insertion of supraglottic device. Sevoflurane is also useful in patients who are at risk of hemodynamic compromise.

Author's Contribution:

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Incidence of Non Alcoholic Fatty Liver Disease in Type II Diabetes Mellitus Patients

Muhammad Tahir, Muhammad Waqas and Namra Anam

ABSTRACT

Objective: To assess the incidence of non alcoholic fatty liver disease in type II diabetes mellitus patients.

Study Design: Prospective / Observational Study

Place and Duration of Study: This study was conducted at the Department of Medicine, Nishtar Hospital Multan, from April 2017 to December 2017.

Materials and Methods: A total no. of 176 took part in the study. Patients were divided into two equal groups on the basis of presence or absence of NAFLD. Age, gender, BMI, plasma AST, plasma ALT, plasma ALP, duration of type II diabetes mellitus, fasting plasma glucose, serum albumin, plasma cholesterol, plasma triglycerides, plasma LDL-C, plasma HDL-C and HbA_{1c} were the variables calculated. All the data was subjected to statistical analysis by using computer software SPSS version 23. Chi square test was applied and P value less than or equal to 0.05 was taken as significant.

Results: The mean age, BMI, plasma AST, plasma ALT, plasma ALP, duration of type 2 DM and fasting plasma glucose of non NAFLD patients was 59.15±5.63 years, 32.03±5.32 kg/m², 19.68±2.22, 19.87±1.71, 62.32±12.84, 8.40±3.71 years, 124.57±5.66 mg/dl respectively. While, the mean age, BMI, plasma AST, plasma ALT, plasma ALP, duration of type 2 DM and fasting plasma glucose of NAFLD patients was 61.55±8.00 years, 32.05±6.24 kg/m², 23.03±2.56, 27.28±1.94, 75.19±21.30, 8.12±1.28 years, and 137.45±5.07 mg/dl respectively. The mean albumin (g/dl), plasma cholesterol, plasma triglyceride, plasma LDL-C and plasma HDL-C of non NAFLD patients was 4.20±0.64 g/dl, 150.65±28.44, 114.04±5.99, 87.25±18.16 and 42.97±11.40 respectively. HbA_{1c} was 9.1% (n=8). While, the mean albumin (g/dl), plasma cholesterol, plasma triglyceride, plasma LDL-C and plasma HDL-C of NAFLD patients was 3.80±0.69 g/dl, 158.62±42.02, 150.07±9.03, 87.0±27.89 and 40.76±10.46 respectively. HbA_{1c} was 6.8% (n=6)

Conclusion: Conclusion from results of this study can be made that NAFLD has a high incidence in patients with type II diabetes mellitus.

Key Words: Non-Alcoholic Fatty Liver Disease, Diabetes Mellitus, Non-Alcoholic Steatohepatitis

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INTRODUCTION

In United States of America and many other parts of the world Non-alcoholic fatty liver disease is considered to be the most common cause of chronic liver disease ¹. Despite this fact, very little information regarding relation between type two diabetes mellitus and non alcoholic fatty liver disease has been known. Use of aminotransferases as screening tools for its diagnosis ² has shown that its prevalence ranges from 15-20% ³ or may be less but contrary to these tests liver ultrasound has shown greater prevalence of non alcoholic fatty liver disease among type two diabetes patients i.e. 20-46%. Prevalence was reported to be 34% when gold standard techniques like, magnetic resonance imaging

and spectroscopy were used for screening ⁴. Obesity is also one of the major risk factors for the development of NAFLD as evident from the various studies present in previous literature ⁵.

Liver plays an important role in pathophysiology of type two diabetes mellitus as it is involved in the development of insulin resistance ⁶. Underlying mechanism which causes fatty changes in the liver of the patient suffering from type two diabetes mellitus is not fully understood. Hepatic fat accumulation, inflammatory signals from different types of immune cells and energy metabolism changes are thought to be the few reasons for development of NAFLD in T2DM. Mitochondrial function, lipotoxins, adipocytes and cytokines have been thought to be involved in both the development of NAFLD and type diabetes mellitus ⁷. Non diabetic patients suffering from NAFLD have insulin resistance. Similarly patients suffering from type diabetes mellitus often develop non alcoholic fatty liver disease due to insulin resistance and might undergo inflammatory changes and develop non alcoholic steatohepatitis. This complication can lead to further serious and more chronic complications like cirrhosis of liver and even development of

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hepatocellular carcinoma. Drugs used in the treatment of type two diabetes mellitus have been shown to be effective in improving conditions like NAFLD and NASH⁸.

Although there are evidences present to establish the relation between type to diabetes and liver fibrosis and steatohepatitis but in settings of normal aminotransferases very little literature have been published. Current study is conducted to determine the prevalence of non alcoholic fatty liver disease among patients of type II diabetes mellitus and different parameters which are altered during development of this change in bodies of the patients. Rationale of our study is to find prevalence of NAFLD in patients of type II diabetes mellitus in local population as even though multiple studies have provided this correlation but in our local settings such evidence and correlation needs to be established so that screening for liver disease among the patients of type II diabetes mellitus can be improved.

MATERIALS AND METHODS

This study was conducted in Nishtar Hospital Multan from April 2017 to December 2017. It is a prospective study with sample size of 176. Sample size was calculated from the reference study by Paola Portillo Sanchez et al⁹. Non probability consecutive sampling technique was used to collect the sample size. Ethical approval for this study was obtained from the Hospital Ethics Committee. Informed consent was taken prior to the inclusion in the study.

All the patients included in our study have had diabetes mellitus for more than five years. Patients were excluded on the basis of following exclusion criteria, prior history of alcohol consumption, history of any chronic liver disease, type I diabetes mellitus or any other serious illness of heart, lungs or kidney. Patients were divided into two equal groups Non-NAFLD group and NAFLD group on the basis of the presence of non alcoholic fatty liver disease. Diagnosis of non alcoholic fatty liver disease was made by measuring total body fat by dual energy x-ray absorptiometry and by measuring liver triglyceride content with the help of magnetic resonance spectrometry. Diagnosis of NAFLD was considered if liver triglyceride content was more than 5.5%.

Age, gender, BMI, plasma AST, plasma ALT, plasma ALP, duration of type II diabetes mellitus, fasting plasma glucose, serum albumin, plasma cholesterol, plasma triglycerides, plasma LDL-C, plasma HDL-C and HbA_{1c} were the variables calculated at the start of the study and at the end of the study. Other than the variables just mentioned treatment with metformin, antihypertensive drugs use and statin use was also taken into account and analyzed in each patient presenting as type II diabetes mellitus.

After recording and measuring the data regarding these variables, all the data was subjected to statistical analysis by using computer software SPSS version 23. Frequency and percentage was calculated for categorical variables and mean and standard deviation was calculated for continuous variables. Chi square test was applied and P value less than or equal to 0.05 was taken as significant.

RESULTS

A total number of n=176 patients were enrolled in this study. This study was divided into two equal groups i.e. 50% (n=88) in each, non NAFLD and NAFLD respectively. The mean age, BMI, plasma AST, plasma ALT, plasma ALP, duration of type 2 DM and fasting plasma glucose of non NAFLD patients was 59.15±5.63 years, 32.03±5.32 kg/m², 19.68±2.22, 19.87±1.71, 62.32±12.84, 8.40±3.71 years, 124.57±5.66 mg/dl respectively. There were 87.5% (n=77) males and 12.5% (n=11) females. While, the mean age, BMI, plasma AST, plasma ALT, plasma ALP, duration of type 2 DM and fasting plasma glucose of NAFLD patients was 61.55±8.00 years, 32.05±6.24 kg/m², 23.03±2.56, 27.28±1.94, 75.19±21.30, 8.12±1.28 years, and 137.45±5.07 mg/dl respectively. There were 80.7% (n=71) males and 19.3% (n=17) females. The difference was statistically significant, except gender (p=0.216) and duration of type 4 DM (p=0.499). (Table I).

Table No.1: Demographic Characteristics among the study groups

Characteristics	Non NAFLD (n=88)	NAFLD (n=88)	Test of Sig.
Age (years)	59.15±5.63	61.55±8.00	t=-2.29, p=0.023
Gender			
Male	87.5% (n=77)	80.7% (n=71)	$\chi^2=1.52$, p=0.216
Female	12.5% (n=11)	19.3% (n=17)	
BMI (kg/m ²)	32.03±5.32	32.05±6.24	t=-3.45, p=0.001
Plasma AST	19.68±2.22	23.03±2.56	t=-9.26, p=0.000
Plasma ALT	19.87±1.71	27.28±1.94	t=-26.83, p=0.000
Plasma ALP	62.32±12.84	75.19±21.30	t=-4.45, p=0.000
Duration of type 2 DM (years)	8.40±3.7	8.12±1.28	t=0.677, p=0.499
Fasting Plasma glucose (mg/dl)	124.57±5.66	137.45±5.07	t=-15.38, p=0.000

Table No.2: Demographic Characteristics

Characteristics	Non NAFLD (n=88)	NAFLD (n=88)	Test of Sig.
Albumin (g/dl)	4.20±0.64	3.80±0.69	t=3.94, p=0.000
treatment with metformin	85.2% (n=75)	81.8% (n=72)	$\chi^2=0.372$, p=0.542
Anti- Hypertensive medications	86.4% (n=76)	84.1% (n=74)	$\chi^2=0.181$, p=0.671
Statin Use	75% (n=66)	83% (n=73)	$\chi^2=1.67$, p=0.195
Plasma cholesterol	150.65±28.44	158.62 ±42.02	t=-1.47, p=0.143
Plasma triglyceride	114.04±5.99	150.07 ±9.03	t=-31.17, p=0.000
Plasma LDL- C	87.25±18.16	87.0±2 7.89	t=0.070, p=0.944
Plasma HDL- C	42.97±11.40	40.76± 10.46	t=1.34, p=0.181
HbA1c %	9.1% (n=8)	6.8% (n=6)	$\chi^2=0.310$, p=0.577

The mean albumin (g/dl), plasma cholesterol, plasma triglyceride, plasma LDL-C and plasma HDL-C of non NAFLD patients was 4.20±0.64 g/dl, 150.65±28.44, 114.04±5.99, 87.25±18.16 and 42.97±11.40 respectively. HbA1c was 9.1% (n=8). Treatment with metformin was 85.2% (n=75). Anti-hypertension medications and use of statin use was 86.4% (n=76) and 75% (n=66) respectively. While, the mean albumin (g/dl), plasma cholesterol, plasma triglyceride, plasma ldl-C and plasma HDL-C of NAFLD patients was 3.80±0.69 g/dl, 158.62±42.02, 150.07±9.03, 87.0±27.89 and 40.76±10.46 respectively. HbA1c was 6.8% (n=6). Treatment with metformin was 81.8% (n=72). Anti-hypertension medications and use of statin use was 84.1% (n=74) and 83% (n=73) respectively. The difference was statistically significant albumin (p=0.000) and plasma triglyceride (p=0.000). (Table 2).

DISCUSSION

NAFLD and NASH are complications of diabetes mellitus and as our results have shown that most of the laboratory findings in people with NAFLD and without NAFLD are almost similar except few, it is important to advise more sensitive and specific methods for the diagnosis of NAFLD in patients with type two diabetes mellitus. There was difference present among the two groups discussed in this study in terms of plasma aminotransferases suggesting that their levels in NAFLD group, even though differ from the levels of plasma aminotransferases in non NAFLD patients but are not high enough to alarm the clinicians about the presence of a fatty liver disease. Plasma triglycerides were also significantly higher in patients with diagnosed NAFLD. Another striking finding in these

results is the presence of statistically significant difference among the two groups in terms of fasting blood glucose suggesting that NAFLD is associated with poor glycemic control in patients with type II diabetes mellitus.

Despite being closely related entities not many studies has shown the evidence of presence of Non alcoholic fatty liver disease in patients with type II diabetes mellitus with normal aminotransferases. Most of the clinicians and physicians believe that ultrasounds and aminotransferases levels which are commonly used in the diagnosis of liver diseases are not sensitive when used for the diagnosis of non alcoholic fatty liver disease ¹⁰. Our study was done to find out the prevalence of non alcoholic fatty liver disease not only because NAFLD or NASH is caused by type two diabetes mellitus ¹¹ but also because NASH and NAFLD can also precipitate micro and macro vascular diseases of type two diabetes mellitus ^{12, 13, 14}.

NAFLD and type II diabetes mellitus are closely associated with each as diabetes mellitus can lead to NAFLD and NAFLD when present can increase the risk of developing type two diabetes mellitus ^{15, 16}. Multiple studies have suggested the presence of liver fibrosis and steatosis in obese patients with type two diabetes mellitus but prevalence is still uncertain as tests for diagnosis of NAFLD and NASH that is ultrasound has very low sensitivity and specificity ¹⁷.

Multiple studies have shown that NASH and NAFLD usually presents with normal levels of plasma aminotransferases^{18,19} but very little number of studies have shown whether NAFLD or NASH with normal amino transferases is associated with type II diabetes mellitus, therefore, leaving a large gap in knowledge in terms of diagnosing the asymptomatic patients with diabetes who might have non alcoholic fatty liver disease or non alcoholic steatohepatitis. Only one previous study has results consistent with results of this study which showed very high prevalence of NAFLD in patients with type two diabetes mellitus.

CONCLUSION

Conclusion from results of this study can be made that NAFLD has a high incidence in patients with type II diabetes mellitus and that it occurs with normal levels of aminotransferases in plasma. Therefore its presence should not be ruled out if these markers are normal in type II diabetes mellitus patients. Moreover obesity is also a risk factor for the development of NAFLD in type II diabetes mellitus.

Author's Contribution:

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Efficacy of Tramadol in Preventing the Post-Anesthetic Shivering After General Anesthesia for Cholecystectomy

Efficacy of
Tramadol in
Preventing the
Post-Anesthetic
Shivering

Ali Ammar, Muhammad Ali Mahota, M. Asif and Aamir Furqan

ABSTRACT

Objective: To study the efficacy of tramadol in preventing the post-anesthetic shivering after general anesthesia for laparoscopic or open cholecystectomy.

Study Design: A randomized controlled trial study

Place and Duration of Study: This study was conducted at the Department of Anaesthesia Nishtar Hospital Multan, From September 5, 2017 to December 15, 2017.

Materials and Methods: A sample of thirty six patients was taken using non-probability consecutive sampling technique. Age, weight, baseline heart rate and mean arterial pressure; temperature before and after surgery and their difference; and degree of shivering and sedation in recovery period were recorded. Chi-square test and one way ANOVA test were applied to compare percentages/nominal data and means, respectively using SPSS v.23 and $p \leq 0.05$ was considered statistically significant.

Results: Considering the treatment groups, the postoperative shivering was 88.9% and 11.1% in group-L1; and 77.7% and 22.2% in group-O1, of grade 0 and 1, respectively. Both the groups were comparable and shivering of grade 2, 3 or 4 was not seen in both these groups. Considering the control groups, postoperative shivering was 22.2% grade 0, 55.5% grade 1, 11.1% grade 2, and 11.1% grade-3 in Group-L2; and 33.3% grade-0, 44.45 grade 1, and 22.2% grade 2 in group-O2. The difference between treatment and control group was statistically significant ($p=0.005$).

Conclusion: Our study concludes that tramadol, when given in adequate doses, is effective in preventing postoperative shivering after laparoscopic and open cholecystectomy.

Key Words: Post-anesthetic shivering, Core temperature, Tramadol, Laparoscopic Cholecystectomy, Open cholecystectomy

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INTRODUCTION

When patients are recovering from general anesthesia, their most common experience is shivering. Almost 60% of the patients go through this experience. The control of autonomic thermoregulatory system is compromised whenever a patient undergoes a general anesthesia¹. Four basic mechanisms of heat transmission^{2, 3} i.e. Conduction, convection, radiation and evaporation are responsible for the loss of heat from skin. Radiation is the most prominent culprit in this scenario. Radiation is the phenomenon in which heat is transferred from one surface, via photons, to another one and is not affected by the temperature of the interfering air. Conduction is the transfer of heat directly from one surface to another adjacent one and is directly proportional to the difference in the temperature

of the two surfaces. The transfer of heat by the movement of fluids in between two surfaces is called convection. The drop in body temperature is augmented by cold intravenous infusions, dry and cold gases used in anesthesia⁴, absent muscular activity, sub dermal vasodilation and cold atmosphere of the operation theatre⁵. All of these factors contribute to hypothermia which is thought to be the primary cause of post-anesthetic shivering.

It is well-known that core hypothermia is more marked in large operations as compared to small operations; and it is contributed mostly by the loss of heat via evaporation. A fall of 1 °C in core body temperature results in shivering⁶. Shivering is defined as a spontaneous, oscillatory muscle movement that enhances metabolic heat generation. It can be a very spiteful experience for the patients who are recovering from general anesthesia. Many patients describe this feeling to be worse than the post-surgical pain. Shivering is physiologically hectic and results in more oxygen depletion⁷, rise in intraocular as well as intracranial pressure, lactic acidosis, arterial hypoxemia, and over activity of sympathetic nervous system. Many pharmacologic agents have been tried in an attempt to prevent this unpleasant outcome, keeping

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above mentioned effects in view, but the exact basis is not understood so far⁸.

According to some studies, the use of tramadol resulted in total elimination of post-anesthetic shivering. Tramadol is a synthetic opioid. It is thought to inhibit shivering by blocking the reuptake of serotonin, dopamine and norepinephrine⁹. Activity of the nucleus median raphe in the medulla is also controlled by tramadol, via its effect on central m opioid receptor, primarily. Its effect over k-receptors is least. The most reported side effects of tramadol are nausea, vomiting, constipation, lightheadedness, dizziness, drowsiness, or headache. When the patient is taking other drugs that enhance serotonin level, the chances of serotonin syndrome increase¹⁰. The risk of toxicity and severe side effects (dizziness, drowsiness and shallow breathing) also increases when other opioids for example pain relievers (codeine) and cough relievers (hydrocodone) are being used. Therefore, tramadol needs to be used carefully in such patients.

The current study is aimed at determining the efficacy of tramadol in reducing or avoiding the shivering that occurs after the general anesthesia, when it was administered in adequate doses before closing the wound, in the patients undergoing cholecystectomy, either through laparoscopic or open surgery.

MATERIALS AND METHODS

This study is a randomized controlled trial. The study was performed in Department of Anaesthesia Nishtar Hospital, Multan, after taking consent from the department ethical committee, over a period from 5 September 2017 to 15 December 2017. The study by Angral R. et al.¹¹ was taken as reference and non-probability consecutive sampling technique was used to select the sample size. Total of thirty six patients who were planned to undergo cholecystectomy, either via laparoscopic (Group-L) or open procedure (Group-O), were included in our study. Both the groups were further divided indiscriminately into two groups, having nine patients each (Group L1, L2, O1 and O2); the treatment groups which were to receive 1mg/kg body weight of tramadol (Group L1 and O1) and the control groups which were to receive a corresponding dose of normal saline (group L2 and O2), before closure of the wound during surgery.

Patients were thoroughly examined and investigated. After reaching the operation theatre, baseline heart rate and mean arterial pressure were recorded after attaching the monitor. Patients were pre-oxygenated with 100% oxygen. Anesthesia was induced using intravenous propofol, followed by vecuronium bromide 0.1mg/kg injection. Endotracheal tube was inserted and fixed. Nasopharyngeal temperature probe was inserted because it lies closest to the base of brain and baseline temperature was recorded. The reading was highly precise and was not affected by breathing or turning of

head. Operating room temperature was maintained at 22-24 °C. Patients were covered with sterilized sheets but were not warmed actively. Diclofenac Sodium was used for analgesia during operation, as an intravenous infusion of 1.5mg/kg body weight diluted in 100ml of normal saline. Required changes were made to maintain oxygen saturation at 98-100%, following pneumoperitonium in the patients undergoing laparoscopic surgery. Tramadol 1mg/kg body weight or equivalent dose of normal saline was given intravenously to the corresponding groups, just before closing the wound during surgery. Nasopharyngeal temperature was recorded again at the end of surgery. Proper doses of neostigmine and glycopyrrolate were used to reverse the neuromuscular blockade. In the recovery room, all the patients were covered with wool blankets and 28% oxygen was given with vent mask.

An observer, who had no knowledge of the nature of the surgical procedure, recorded pulse rate, mean arterial pressure, degree of sedation and grade of post anesthetic shivering after every five minutes, for half an hour. The criteria presented by Crossley and Mahajan¹² was used to assess the grade of post anesthetic shivering. (Table-1). Table-2 as used to assess the grade of sedation. Tramadol 1mg/kg was given to control the shivering. The patients who had suffered from some severe febrile illness, had respiratory illness which could compromise breathing and received sedatives or narcotics in recent preoperative period, were excluded from our study. Age, weight, baseline heart rate and mean arterial pressure; temperature before and after surgery and their difference; and degree of shivering and sedation in recovery period were recorded on a preformed Performa, by the researcher himself. Chi-square test and ANOVA test were applied to compare percentages/nominal data and means, respectively. Data was analyzed using SPSS v.23 and value of $p \leq 0.05$ was considered statistically significant.

RESULTS

Mean age, mean weight were 35.78 ± 3.9 years and 56.1 ± 5.47 Kg in group-L1; 37 ± 4.87 years and 56.02 ± 2.74 kg in group-L2; 36.67 ± 3.6 years and 55.04 ± 5.47 Kg in group-O1; and 34.56 ± 4.95 years and 53.78 ± 6.83 Kg in group-O2, respectively. The male to female ratio was 7:2 in all the groups. (Table-3)

The baseline heart rate and mean arterial pressure was 90.56 ± 3.64 /min and 92.00 ± 2.74 mmHg in group-L1; 89.22 ± 4.82 /min and 90.67 ± 3.39 mmHg in group-L2; 88.56 ± 3.50 /min and 92.33 ± 3.39 mmHg in group-O1; and 90.78 ± 3.93 /min and 91.11 ± 2.57 mmHg in group-O2, respectively. The differences were not statistically significant ($p > 0.05$). Duration of surgery and anesthesia was 115.67 ± 11.64 min and 122.33 ± 10.51 min in group-L1; 117.67 ± 10.35 min and 123.88 ± 10.28 min in group-L2; 95.00 ± 15.61 min and 101.44 ± 14.65 min in group-O1; and 96.67 ± 16.39 min and 102.44 ± 16.88 min in

group-O2, respectively. The differences were statistically significant ($p < 0.05$). (Table-4). Mean preoperative temperature, postoperative temperature and the difference in temperature was $36.6 \pm 0.27^\circ\text{C}$, $36.03 \pm 0.43^\circ\text{C}$ and $0.56 \pm 0.42^\circ\text{C}$ in group-L1; $36.48 \pm 0.29^\circ\text{C}$, $36.10 \pm 0.35^\circ\text{C}$ and $0.38 \pm 0.21^\circ\text{C}$ in group-L2; $36.47 \pm 0.39^\circ\text{C}$, $36.28 \pm 0.48^\circ\text{C}$ and $0.18 \pm 0.14^\circ\text{C}$ in group-O1; and $36.63 \pm 0.36^\circ\text{C}$, $36.42 \pm 0.41^\circ\text{C}$ and $0.21 \pm 0.10^\circ\text{C}$ in group-O2, respectively. There was a significant drop in temperature in patients undergoing laparoscopic and open cholecystectomy ($p = 0.009$). (Table-5)

Considering the treatment groups, the postoperative shivering was 88.9% and 11.1% in group-L1; and 77.7% and 22.2% in group-O1, of grade 0 and 1, respectively. Both the groups were comparable and shivering of grade 2, 3 or 4 was not seen in both these groups. Considering the control groups, postoperative shivering was 22.2% grade 0, 55.5% grade 1, 11.1% grade 2, and 11.1% grade-3 in Group-L2; and 33.3% grade-0, 44.45 grade 1, and 22.2% grade 2 in group-O2. The differences were statistically significant ($p = 0.005$). (Table-6) Postoperative sedation of grade 0 and 1 was 77.7% and 22.2% in group-L1; 66.6% and 33.3% in group-L2; 66.6% and 33.3% in group-O1; and 77.7% and 22.2% in group-O2, respectively. All the groups were comparable and postoperative sedation of grade 2, 3 or 4 was not seen in any of these groups. (Table-7).

Table No.1: Grade of Shivering

Grade	Clinical Signs
0	No Shivering
1	peripheral vasoconstriction or Piloerection, but shivering not visible
2	Muscular activity (fasciculation) in only one muscle group
3	Muscular activity in more than one muscle group, but no generalized shivering
4	Shivering involving the whole body, with generalized shaking

Table No.2: Grades of Sedation

Grade	Clinical Signs
0	Alert
1	Arouse to voice
2	Arouse with gentle tactile stimulus
3	Arouse with vigorous tactile stimulus
4	No awareness

Table No.3: Demographic Details

Variable	Group-L1	Group-L2	Group-O1	Group-O2
Age (years)	35.78 ± 3.9	37 ± 4.87	36.67 ± 3.6	34.56 ± 4.95
Weight (Kg)	56.1 ± 5.47	56.02 ± 2.74	55.04 ± 5.47	53.78 ± 6.83
Male/Female Ratio	7:2	7:2	7:2	7:2

Values are Mean $\pm$ S.D or Ratio

Table No.4: Baseline Vitals and Surgery duration

Variable	Group-L1	Group-L2	Group-O1	Group-O2
Heart Rate (beats/min)	90.56 ± 3.64	89.22 ± 4.82	88.56 ± 3.50	90.78 ± 3.93
MAP (mmHg)	92.00 ± 2.74	90.67 ± 3.39	92.33 ± 3.39	91.11 ± 2.57
Surgery Duration (min)*	115.67 ± 11.64	117.67 ± 10.35	95.00 ± 5.61	96.67 ± 6.39
Anesthesia Duration (min)*	122.33 ± 10.51	123.88 ± 10.28	101.44 ± 14.65	102.44 ± 16.88

Values are Mean $\pm$ S.D or Number; MAP=mean arterial pressure; * $p > 0.05$ and is significant.

Table No.5: Variation in Temperature ($^\circ\text{C}$)

Variable	Group-L1	Group-L2	Group-O1	Group-O2
Preoperative	36.60 ± 0.27	36.48 ± 0.29	36.47 ± 0.39	36.63 ± 0.36
Postoperative	36.03 ± 0.43	36.10 ± 0.35	36.28 ± 0.48	36.42 ± 0.41
Difference*	0.56 ± 0.42	0.38 ± 0.21	0.18 ± 0.14	0.21 ± 0.10

Values are Mean $\pm$ S.D or Number; * $p = 0.009$, statistically significant fall in temperature

Table No.6: Incidence of Post-Operative Shivering According To Severity

Grade	Group-L1	Group-L2	Group-O1	Group-O2
0	8(88.9)	2(22.2)	7(77.7)	3(33.3)
1	1(11.1)	5(55.5)	2(22.2)	4(44.4)
2	0	1(11.1)	0	2(22.2)
3	0	1(11.1)	0	0
4	0	0	0	0

Values are numbers and percentages, N (%); $p = 0.005$, statistically significant.

Table No.7: Incidence of Post-Operative Sedation According To Severity

Grade	Group-L1	Group-L2	Group-O1	Group-O2
0	7(77.7)	6(66.6)	6(66.6)	7(77.7)
1	2(22.2)	3(33.3)	3(33.3)	2(22.2)
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0

Values are numbers and percentages, N (%); $p > 0.05$, not significant.

DISCUSSION

In our study, we deduced that tramadol at a dose of 1mg/kg caused a significant decrease in post anesthetic shivering in patients undergoing cholecystectomy, regardless of laparoscopic or open surgical procedure. These effects were noted when the patients were in recovery room and were under no or mild sedation.

Angral R. et al.¹¹ concluded in their study that tramadol was safe and effective for prevention of postoperative shivering after open and laparoscopic cholecystectomy, when given in a dose of 1 mg/kg. They observed minimum side effects at this dose level. In a study, conducted by Heidari SM et al.¹³ in 2014, they revealed that the incidence of high grade post anesthetic shivering was considerably lower in the group receiving tramadol at the end of surgery as compared to the group which received placebo. But the overall prevalence of post anesthetic shivering was not different in both groups. They suggested that increasing the dosage of tramadol can have better effects on reducing shivering. Both of these studies produced results that are in agreement with the results of our study.

In a recent study, Nakagawa T. et al.¹⁴, while studying the effects of tramadol on post anesthetic shivering after general anesthesia with remifentanyl and sevoflurane, established that post anesthetic shivering was significantly reduced after administration of tramadol. This response of tramadol was independent of the concentration of remifentanyl at the time of induction of anesthesia. According to them, tramadol can be a suitable drug for the prevention of post anesthetic shivering. A randomized control trial by Yousuf B.¹⁵ produced the similar results. This study concluded that the need for treatment of post anesthetic shivering and pain was reduced when a 1mg/kg prophylactic dose of tramadol was given to the patients.

Tewari A. et al.¹⁶ compared the effects of tramadol and clonidine over post anesthetic shivering in elderly patients undergoing transurethral resection of prostate under subarachnoid block. They came to conclusion that tramadol was comparable to clonidine in reducing the severity and duration of post anesthetic shivering but tramadol has a plus point of decreasing postoperative pain. Mahesh T. et al.¹⁷ compared the post anesthetic effects of tramadol and pethidine which showed tramadol to be better agent with respect to producing earlier and enhanced anti-shivering effects. Dhimar AA¹⁸ also compare tramadol with pethidine and found tramadol to be qualitatively better in terms of being more potent in controlling the post anesthetic shivering and its relapse.

In contrast with our results, Shukla U.¹⁹ found out that tramadol took longer time to attain full cessation of post anesthetic shivering in the patient who were given spinal anesthesia. The incidence of side effects was also frequent with tramadol.

There is need to conduct further studies to compare the effects of tramadol on post anesthetic shivering with different types of anesthesia.

CONCLUSION

Our study concludes that tramadol, when given in adequate doses, is effective in preventing postoperative shivering in patients undergoing laparoscopic and open cholecystectomy, when compared with patients who were injected intravenously with equivalent doses of normal saline.

Author's Contribution:

Concept & Design of Study:	Ali Ammar
Drafting:	Ali Ammar, Ali Ammar
Data Analysis:	Muhammad Ali Mahota, M. Asif, Aamir Furqan
Revisiting Critically:	Ali Ammar, Ali Ammar
Final Approval of version:	Ali Ammar

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Comparing the Analgesic Effects of IV Paracetamol Plus Ketorolac and IV Fentanyl for Pain Control after Thyroidectomy

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ABSTRACT

Objective: To determine the analgesic effects of intravenous paracetamol plus ketorolac and intravenous fentanyl for pain control after Thyroidectomy.

Study Design: A Randomized Control Trail study.

Place and Duration of Study: This study was conducted at the Department of Anesthesiology, Nishtar Hospital Multan, January 2017 to December 2017.

Materials and Methods: Total 128 patients was included in our study. All patients were divided in two equal groups, group P and Group F, with 64 patients in each group. Group P patients received IV paracetamol plus ketorolac where as Group F patients were managed by IV fentanyl for postoperative pain. Visual Analog Scale on 0-10 was used for assessment of pain and whole procedure was explained to the patients. Pain scores were interpreted as 0=no pain, 1-4=mild pain, 5-7=moderate pain and 8-10=severe pain. Data regarding age, VAS score and side effects was analyzed by using SPSS version 23. Mean and standard deviation was calculated for numerical variables, while frequency and percentage was calculated for qualitative variables. Statistical analysis was carried out using computer software SPSS version 23. T test was applied for quantitative data and Chi square test for qualitative data. P value less than or equal to 0.05 was taken as significant.

Results: In group-P, 55(85.94%) patients experienced mild pain, 6(9.37%) patient experienced moderate pain and 3(4.69%) patients suffered severe pain. In group-F, 57(89.06%) patients experienced mild pain and 7(10.94%) patients experienced moderate pain. The difference in efficacy of drugs in both the groups was not statistically significant (p=0.211).

Conclusion: There was no significant difference found between intravenous paracetamol plus ketorolac and fentanyl in terms of pain control.

Key Words: Paracetamol, Ketorolac, Fentanyl, Thyroidectomy

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INTRODUCTION

Post operative management requires particular attention after surgical procedures and interventions. With recent advances it has been now possible to understand the physiology of pain and complications it can create, along with its management.

Narcotics especially short acting narcotics are in wide use in intra as well as postoperative pain management in multiple procedures¹. Fentanyl belongs to the opioid class of analgesics and it is synthetic opioid, with rapid onset of action and high lipid solubility². Its onset takes two minutes and it provides analgesic effect from thirty to sixty minutes³.

As far as the side effects of fentanyl are concerned, pruritus, respiratory depression, thoracic and skeletal muscle rigidity are the common side effects⁴. It has also been associated with delayed discharge from hospital postoperative. Fentanyl has its pharmacological effect directly on central nervous system. Clinically it is analgesic as well as sedative in action. It decreases pain perception and increases tolerance of the patient for pain; where as feeling of pain still might exist as such⁵. Mood alteration, euphoria, drowsiness and dysphoria are other effects of this opioid drug. It depresses respiration and depresses cough reflex and also results in pupil constriction.

In contrast to fentanyl, paracetamol is a non opioid drug used for pain relief⁶. It has proved to be effective and quite safe drug in management of mild to moderate pains. Different routes are used for administration of paracetamol i.e. oral, rectal and intravenous. Intravenous paracetamol has been popularly recognized in literature during recent times, as a potent analgesic. It readily crosses blood brain barrier, maintaining high concentrations in cerebrospinal fluid and acts as anti-

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nociceptive via central nervous system. Paracetamol was first introduced in 2002 as an intravenous drug ⁷. Its onset takes five to ten minutes and its peak effect is obtained within an hour and it provides analgesia for four to six hours ⁸. Although it has no side effects of respiratory depression, circulatory depression and sedative effect but it is only effective in mild or moderate pain. Paracetamol is an excellent option when immediate venous injection is required for mild to moderate pain relief or fever. It is also proved to be safe in terms of side effects as compared to NSAIDS and opioids. Moreover it is also useful when only venous injection is possible for mild to moderate pain and fever especially postoperatively. Paracetamol has similar analgesic effects to NSAIDS. Among NSAIDS Ketorolac is an effective analgesic for efficient control of mild to moderate pain. But literature has shown that its long term use can cause local hemorrhage, GI bleed and renal insufficiency.

Rationale of our study is to conduct this trail so that postoperative pain management after thyroidectomy can be improved. Even though multiple studies have discussed the role of opioids and other analgesics in pain control, in this study we are comparing two specific drugs i.e. paracetamol and fentanyl when given intravenously. Very little data was found regarding comparison of these two drugs that is why it requires to be studied further.

MATERIALS AND METHODS

This randomized control trail was conducted in department of Anesthesiology, Nishtar Hospital Multan from January 2017 to December 2017. Ethical was obtained from Department Ethics Committee. Total no. of 128 patients was included in our study. Sample size was calculated using the reference study by Muhammad Ali Asghar et al ⁹. Sample size was calculated using non probability sampling technique. All patients were divided in two equal groups, group P and Group F, with 64 patients in each group. Group P patients received IV paracetamol plus ketorolac where as Group F patients were managed by IV fentanyl for postoperative pain. All the patients were selected for elective surgery for thyroid disease. Inclusion criteria was patient presenting for thyroidectomy because of thyroid enlargement, either hyperthyroid or euthyroid in outdoor patient department of Nishtar Hospital Multan. Patient with previous addiction, psychiatric illness, severe renal impairment or hepatic disease, allergy to paracetamol or opioids and BMI of equal to or greater than 30 were excluded from the study.

Thyroidectomy was performed by a surgeon with at least five year experience and researcher collected data from patients by himself. General anesthesia provided perioperatively was same in both groups. Midazolam and fentanyl was injected as premedication and

propofol and atracurium were used for induction of anesthesia.

Fifteen minutes before the completion of the procedure an injection of fentanyl was injected intravenously and in the end muscle relaxation was reversed by the use of neostigmine and atropine. Postoperatively IV paracetamol plus Ketorolac 15mg/kg was injected in group P and IV fentanyl 2 μ g/kg was injected in Group F patients. Visual Analog Scale on 0-10 was used for assessment of pain and whole procedure was explained to the patients. Pain scores were interpreted as 0=no pain, 1-4=mild pain, 5-7=moderate pain and 8-10=severe pain.

If any patient complained of pain of VAS >4, meperidine was injected. It was used as an adjunctive therapy in case patient demanded or until VAS becomes 4 or less than 4. Total no. of doses was calculated along with total dose given to each patient. Data regarding side effects of analgesia was also collected for postoperative nausea, vomiting, respiratory rate, pruritus and urinary retention. All data was collected through a predesigned Performa. Mean and standard deviation was calculated for numerical variables, while frequency and percentage was calculated for qualitative variables. Statistical analysis was carried out using computer software SPSS version 23. T test was applied for quantitative data and Chi square test for qualitative data. P value less than or equal to 0.05 was taken as significant.

RESULTS

Total of 128 patients were divided into two equal groups. Means of age, weight and height were 27.90 $\pm$ 3.72 years, 65.17 $\pm$ 6.21 kg and 157.86 $\pm$ 6.16 cm in Group-P and 26.73 $\pm$ 3.74 years, 26.73 $\pm$ 3.74 kg and 159.97 $\pm$ 6.17 cm in Group-F, respectively. There was no statistically significant difference. Both the groups consisted of 36 (56.25%) patients of ASA-I and 28 (43.75%) patients of ASA-II class, each. (Table-1)

Table No.1: Demographic and Anesthetic Data

Variable	Group-P (n=64)	Group-F (n=64)	p-value
Age (Years)	27.90 $\pm$ 3.72	26.73 $\pm$ 3.74	0.957
Weight (Kg)	65.17 $\pm$ 6.21	26.73 $\pm$ 3.74	0.951
Height (cm)	157.86 $\pm$ 6.16	159.97 $\pm$ 6.17	0.836
ASA I (%)	36 (56.25)	36 (56.25)	0.571
ASA II (%)	28 (43.75)	28 (43.75)	

Data are presented as Mean $\pm$ Standard Deviation and Number (percentage); ASA=American Society of Anesthesiologists.

In group-P, 55(85.94%) patient's experienced mild pain, 6(9.37%) patient's experienced moderate pain and 3(4.69%) patients suffered severe pain. In group-F, 57(89.06%) patients experienced mild pain and 7(10.94%) patients experienced moderate pain. The difference in efficacy of drugs in both the groups was not statistically significant ($p=0.211$). (Table-2)

In group-P, out of 64 patients, 6 (9.37%) experienced nausea, 3(4.69%) experienced vomiting, and 2 (3.12%) experienced respiratory depression. In group-F, out of 64 patients, 9 (14.06%) experienced nausea, 8 (12.5%) experienced vomiting, 8 (12.5%) experienced respiratory depression, and 3 (4.69%) experienced muscular rigidity. The difference was statistically significant ($p=0.013$). (Table-3)

Table No.2: Comparison of Pain Relief in Both Groups

Severity of Pain	Group-P (n=64)	Group-F (n=64)	p-value
Mild	55 (85.94)	57 (89.06)	0.211
Moderate	6 (9.37)	7 (10.94)	
Severe	3 (4.69)	0 (0)	

Data are presented as number (percentage); $p=0.211$, not significant statistically.

Table No.3: Side Effects

Side Effect	Group-P (n=64)	Group-F (n=64)	p-value
Nausea	6 (9.37)	9 (14.06)	0.013
Vomiting	3 (4.69)	8 (12.5)	
Respiratory Depression	2 (3.12)	8 (12.5)	
Muscular Rigidity	0 (0)	3 (4.69)	

Data are presented as number and percentage, N (%); $p=0.013$, statistically significant

DISCUSSION

Pain management has reached new advances in recent time, especially postoperative pain management. It is due to the fact that poor pain management during perioperative periods results in severe long term as well as short term complications. These complications include anxiety, morbidity, postoperative hospital stay and expenses. With provision of good analgesia, these tiresome complications can be totally avoided or at least reduced.

Short acting opioids are in common use for pain control in postoperative period after multiple surgical procedures of short durations. It is because of the fact that these drugs provide good analgesia^{10, 11}. Despite the fact that these drugs are very effective in controlling pain, but resource variability in developing countries like ours force the care providers to look for alternate safe modalities for pain control. In practice we commonly face the challenge of unavailability and

shortage of short acting narcotics which restrict the anesthesiologists to use alternatives. Fentanyl even though is an opioid analgesic it has lesser side effects like, respiratory depression, bradycardia and hypotension, etc as compared to the other drugs in this group¹².

Intravenous paracetamol is theoretically more acceptable and has a greater predictability as compared to the oral and rectal routes of administration. It readily crosses blood brain barriers and shows its analgesic effects within few minutes up till 4 hours after which its effects starts to wear off. The reason why it is preferred in most surgical procedure is that, it has no effects on mental status, respiratory rate, renal function, gastrointestinal mucosa and bleeding¹³. Our study aimed at finding the efficacy of IV paracetamol plus Ketorolac and fentanyl in pain management after thyroidectomy.

A comparison of IV paracetamol and placebo was carried out by Sinatra et al¹⁴ after orthopedic surgery. In that study it was found that intravenous paracetamol given over the period of 24 hours for pain ranging from moderate to severe, provided very effective and rapid analgesia and that paracetamol was well tolerated by the patients. In another study IV paracetamol was compared with oral ibuprofen for postoperative pain in patients undergoing cesarean section. In this study these two drugs were used in addition to morphine and results proved that IV paracetamol had better efficacy as compared to the oral ibuprofen¹⁵. A study conducted by Tsang et al¹⁶ compared opioid sparing effect of IV paracetamol in preoperative hip fracture patients. Results showed significant opioid sparing effect of IV paracetamol and also provided satisfying results in terms of pain control.

In a comparative study of IV paracetamol and IV morphine in pain management of acute limb trauma patients showed that even though paracetamol and morphine were equal in reduction of pain and requirement of rescue medication yet paracetamol had significantly lower incidence of side effects as compared to the morphine. There was no significant variation between the two groups in terms of patient satisfaction and pain relief¹⁷.

In another study 84 patients undergoing knee arthroscopy were studied for mild to moderate pain management by using IV morphine and IV paracetamol just before awakening from general anesthesia. Like our study no significant difference was found in the efficacy of the two groups and it was found that morphine was associated with greater number of side effects as compared to the IV paracetamol¹⁸. Similar results were found in multiple other studies where IV paracetamol was compared to IV fentanyl and other IV opioids in postoperative pain management¹⁹.

CONCLUSION

There was no significant difference found between intravenous paracetamol plus ketorolac and fentanyl in terms of pain control, but less side effects in term of nausea, vomiting, respiratory depression and muscle rigidity was group paracetamol plus ketorolac as compared to fentanyl group.

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Self-Reported Dental Health Attitude and Practices Among Undergraduate Students of Physiotherapy Program of a Government Institute of Karachi, Pakistan

Beenish Zaffar¹, Samia Khanam², Uzma Zareef³ and Syed Shahzad Ali⁴

ABSTRACT

Objective: The object is to evaluate self-reported oral health attitudes and behavior among DPT students of a government institute of Karachi.

Study Design: Cross sectional study.

Place and Duration of Study: This study was conducted at the Department of Physiotherapy, Institute of Physical Medicine & Rehabilitation, DUHS, Karachi from October to December 2017.

Materials and Methods: It is a cross-sectional study in which 200 students (both male and female) that were studying in a reputed physiotherapy college segregated into preclinical and clinical groups were the part of this study. Hiroshima University Dental Behavioral Inventory (HU-DBI), a self-administered questionnaire was used to collect data. The data was analyzed through SPSS.20.

Result: 50% (n=100) preclinical and 50% (n=100) clinical students were found out. The questionnaire is used to assess their perception and awareness level about their oral health. Both the groups of students were overall satisfied with the appearance of their teeth [mean value 4.4, 4.8, p-value 0.143 (pre-clinical and clinical respectively)]. the clinical side students scored significantly high when they asked about using standard sized toothbrush mean 5.5 (1.93) as compare to mean 4.8 (2.23) score of preclinical students, p-value 0.014. interestingly the early academic year students were less worried about visiting a dentist when needed as compare to their senior fellows [mean 5.16 (2.3), 4.02 (2.2), p-value <0.01].

Conclusion: Our study concluded that at certain levels the Clinical DPT students demonstrated enhanced approaches towards oral healthiness behavior in comparison to preclinical, but still that one obligatory to endorse a widespread oral hygiene sequencer for DPT students to start from the early weeks of their introduction to clinical field as good oral hygiene has good impact on verbal communication.

Key Words: HUDBI (Hiroshima University Dental Behavior Inventory), oral hygiene, physiotherapy

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INTRODUCTION

DPT students, future physical therapists are integral part of health care services and their physical well-being is as essential as the knowledge and skills they

carry. Dental hygiene plays an important role in maintenance of one's health. A good quality of life is possible if students maintain their oral health and become free of oral disease¹. The aim of our study is to evaluate self-reported oral health attitudes and behavior among DPT students of a government institute of Karachi, Pakistan. In the absence of adequate care, resulting oral diseases like dental caries, periodontal problems and bad odor known as halitosis that can have not only physical and functional but also social impacts². Oral causes, such as poor oral hygiene, periodontal disease, tongue coating, food impaction are far more common causes of malodor, stained teeth and malodor has direct impact on communication as Physical therapist deals patients in very closer contact. Management may include simple measures such as scaling, tongue cleaning, and mouth rinsing³.

Literature Review: Today we are living in a modern era, in which world has become more developed in terms of science and technology consumption of junk food and fizzy drinks along with lesser concentration at

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oral hygiene has affected the good oral health⁴. As it is the universally accepted phenomenon that physical therapists have the crown in maintenance of activities of daily living⁵. Not only have they embraced the accountability to impart rehabilitation approaches not only to their patients and the general public but on the other hand also to be an exemplar themselves as per their efforts in spreading the awareness regarding health education and to be a good communicator there is always a great emphasis on good oral hygiene⁶. For this motive, that one is considerable to gauge the DPT students' yearly advancement associated to their peculiar oral hygiene by way of their progress towards clinical experiences⁷.

The Hiroshima University dental behavioral Inventory (HUDBI), comprising of absolute responses (Agree-Disagree), established by Kawamura to scrutinize oral health attitudes and behavior in quite a lot of other countries and has reliability of worth⁸. Oral healthiness awareness is contemplated as one of the vital criterion for health-related behavior among DPT students⁹. A professional institute is alleged to be a place where a sense of obligation and accountability instill in students all through their academic years, that will have undeviating impact on their communication skills¹⁰. Since assisting healthiness personnel have their academic majors in precautionary information and health advancement, it is of utmost importance that their individual oral health understanding is good and their oral health conduct adapts to proficient commendations¹⁰.

In an analogous research concerning to the assessment of dental wellbeing characteristics amongst dental undergraduates it was discovered, with the exception of a small number of dissimilarities i.e females being more conscious and careful about their dental health, all the students had the competency to extemporize and contrivance their familiarity regarding extreme dental care¹¹. In one more study directed in Turkey in 2011 by Sinem et al, outcomes revealed students of clinical years had greater HU-DBI tally in relevance to that of non-clinical students¹².

One of the scientific study done at United Arab Emirates (UAE), equated hygiene practices between medical and dental students, in order to evaluate the significance of dental education in UAE. Substantial variances were found associated to dental health attitudes indicative of the impact of dental health knowledge and awareness amongst the dental undergraduates towards their peculiar oral maintenance as related to their therapeutic counterparts¹³.

MATERIALS AND METHODS

The data was collected from Department of Physiotherapy, Institute of Physical Medicine & Rehabilitation, DUHS between October to December 2017.

Study conducted among students of a renowned physical therapy institute of Karachi in 2017. This is a

cross sectional study. Sample size that was premeditated, established on the amount of students' inclusion was 200, by keeping confidence interval 95% and standard error of mean 5%.

Inclusion criteria: Students of both the genders enrolled in 1st and 2nd year DPT program were selected for pre-clinical group and those enrolled in 3rd, 4th and 5th year DPT program were selected for clinical group, Age limit was between 18-24 years.

Exclusion criteria: Students enrolled in DPT program but are suffering from stress or from any acute dental problem was excluded as this may affect their response.

Data Collection Tool: Data was collected using English version of authenticated self-administered Hiroshima University Dental Behavioral Inventory (HU-DBI), questionnaire. The questionnaire comprised of statements related to oral hygiene practices, the whole questionnaire has double choices by way of their replies, i.e. every respondent may pick to either come to affirmative response or differ with the statements rendering to his/her practices. Communal of these replies illustrated a quantifiable guesstimate of oral hygiene behavior of students. The responses of the students were noted on Likert scale with 1 to 7 with 1 means Strongly Disagree and 7 means Strongly Agree. Later on, students were divided into two groups depending on their academic status i.e. clinical and pre-clinical and then their scores were compared.

RESULTS

Table No.1. Demographic characteristic of the students

Age(year)Mean±SD	21.98±2.14	
18 -20	58	29.0
21 - 23	101	50.5
> 23 years	41	20.5
Year of education		
First	34	17.0
second	32	16.0
Third	34	17.0
Fourth	50	25.0
Fifth	50	25.0
Posting		
Pre-clinical	100	100
Clinical	100	100

Table No.2. Distribution of the student's gender and HUDBI Score

		Freq- uency	%age	Mean HU- DBI score (SD)	P Value
Gender	Female	183	91.5	3.82 (0.77)	0.45
	Male	17	8.5	3.67 (0.05)	

A total of 200 participants were recruited in the study. The mean age of the participants was found to be 21.98 ± 2.15 included both male and female. The male to female ratio in both clinical and pre-clinical group and other demographic characteristics has been shown in table 1 & 2. The participants were divided into clinical and pre-clinical groups on the basis of their academic year of study. A difference has been observed in the awareness level among the pre-clinical and clinical

students and it could be seen that clinical student are more aware as compared to pre-clinical students related to the concept of oral hygiene awareness (table 3). The female students has a slightly better overall mean score 3.82 (0.77) as compare to male students 3.67 (0.50) but the difference is not significant (p-value 0.45). Significant difference was also found at certain levels when students were compared on the basis of their age groups as shown in table 4.

Table No.3: Comparison of the HU-DBI scores between pre-clinical and clinical DPT student

Hiroshima university Dental Behavioral inventory Questionnaire	Preclinical (n = 100)		Clinical (n = 100)		t-test	
	Mean	SD	Mean	SD	Statistic	P-value
"I am satisfied with the appearance of my teeth"	4.4400	2.41343	4.8800	1.76	-1.471	0.143
"My gums tend to bleed when I brush my teeth".	2.3400	1.96546	2.9900	2.16	-2.224	0.02*
"I worry about the color of my teeth".	4.2200	2.44776	4.2800	2.07	-.187	0.852
"I have noticed white sticky deposits on my teeth"	3.0600	2.44048	3.4700	2.23	-1.240	0.216
"I use a standard-sized toothbrush".	4.8200	2.23553	5.5500	1.93	-2.469	0.014*
"I think that I cannot help having false teeth when I am old".	2.8000	2.64384	3.5500	2.37	-2.110	0.036*
"I am worried by the color of my gums."	3.0600	2.24202	3.2600	2.20	-.637	0.525
"I think my teeth are getting worse despite my daily brushing".	3.0600	2.39874	2.5800	1.91	1.566	0.119
"I brush each of my tooth carefully".	4.8400	2.32995	4.8500	2.11	-.032	0.975
"I have never been taught professionally how to brush".	4.3200	2.32196	3.5000	2.38	2.466	0.015*
"I think I can clean my teeth well without using tooth paste".	1.5400	1.19274	2.7500	2.18	-4.860	<0.01*
"I often check my teeth in a mirror after brushing".	5.4400	1.98133	5.5800	1.72	-.533	0.595
"I worry about having bad breath".	4.1600	2.48925	4.0200	2.42	.403	0.687
"It is impossible to prevent gum disease with tooth brushing alone".	4.2800	2.45394	4.3900	2.23	-.332	0.741
"I never go to a dentist until I have a toothache".	5.6200	2.13570	4.8700	2.39	2.340	0.02*
"I have used a dye to see how clean my teeth are".	2.8800	2.29747	2.4900	1.99	1.281	0.20
"I use a toothbrush which has hard bristles".	2.9000	2.23155	2.5918	1.87	1.053	0.29
"I do not feel I have brushed well unless I brush with strong strokes"	4.1800	2.39267	2.9800	2.06	3.801	<0.01*
"I feel that sometimes I take too much time to brush my teeth".	4.4200	2.31019	3.8400	2.21	1.816	0.071*
"I have had my dentist tell me that I brush very well".	2.7000	2.59175	3.4900	2.38	-2.247	0.026*
"I do not worry much about visiting the dentist if needed"	5.0600	2.29545	4.0200	2.21	3.263	0.001*
Over all Mean Score	3.8162	.73697	3.8038	0.77	.116	0.908

Independent t test applied - *P-value significant (<0.05)

Table No.4. Comparison of the HU-DBI scores among age group of students

Hiroshima university Dental Behavioral inventory Questionnaire	18 – 20 (n = 58)		21 - 23 (n = 101)		Greater 23 year (n = 41)		ANOVA Test	
	Mean	SD	Mean	SD	Mean	SD	Statistic	P-value
I am satisfied with the appearance of my teeth	4.43	2.3	5.02	1.9	4.07	2.0	3.53	0.03*
My gums tend to bleed when I brush my teeth.	2.38	1.8	2.53	2.1	3.42	2.2	3.5	0.03*
I worry about the color of my teeth.	4.19	2.5	4.19	2.2	4.49	2.1	0.28	0.75
I have noticed white sticky deposits on my teeth	3.53	2.	2.87	2.3	3.85	2.3	3.18	0.04*
I use a standard-sized toothbrush.	4.91	2.2	5.52	1.9	4.76	2.3	2.58	0.08
I think that I cannot help having false teeth when I am old.	2.10	2.5	3.3	2.4	4.39	2.3	11.0	<0.01*
I am worried by the color of my gums.	2.76	2.3	3.26	2.1	3.49	2.4	1.50	.225
I think my teeth are getting worse despite my daily brushing.	2.95	2.3	2.62	2.1	3.12	2.3	0.91	.40
I brush each of my tooth carefully.	5.09	2.1	5.19	2.1	3.66	2.4	7.9	<.01*
I have never been taught professionally how to brush.	4.24	2.4	3.90	2.3	3.46	2.6	1.28	0.28
I think I can clean my teeth well without using tooth paste.	1.89	1.6	2.07	1.9	2.65	2.1	2.17	0.12
I often check my teeth in a mirror after brushing.	5.91	1.6	5.56	1.7	4.83	2.4	4.31	0.02*
I worry about having bad breath.	3.64	2.4	4.01	2.4	4.93	2.3	3.52	0.03*
It is impossible to prevent gum disease with tooth brushing alone.	3.72	2.2	4.67	2.4	4.39	2.34	3.04	0.05*
I never go to a dentist until I have a toothache.	4.93	2.3	5.52	2.2	5.02	2.3	1.44	0.24
I have used a dye to see how clean my teeth are.	3.78	2.5	2.34	1.9	2.0	1.5	12.0	<.01*
I use a toothbrush which has hard bristles.	2.36	1.9	3.01	2.2	2.66	1.8	1.87	0.16
I do not feel I have brushed well unless I brush with strong strokes	4.36	2.3	3.22	2.3	3.37	2.1	4.94	.01*
I feel that sometimes I take too much time to brush my teeth.	4.72	2.1	4.02	2.3	3.56	2.3	3.47	.03*
I have had my dentist tell me that I brush very well.	3.09	2.6	3.24	2.6	2.76	2.2	.53	0.59
I do not worry much about visiting the dentist if needed	4.56	2.6	4.75	2.1	4.0	2.4	1.56	0.21
Over all Mean Score	3.79	0.8	3.84	0.7	3.76	0.8	.23	0.79

Independent t test applied - *P-value significant (<0.05)

DISCUSSION

The study provided multiple information related to the oral hygiene awareness level among the DPT students of Karachi, Pakistan. The result is in accordance with the study of Yildiz et al among dental and medical students, in which he concluded that the student awareness increases with the increase in the academic grades and the students of fourth and the final year are more orally hygiene conscious than the students of first and the second year¹². However, the result obtained from this study suggested that all of the DPT students irrespective of their academic levels are conscious and well aware about their oral hygiene. According to the present study at some point clinical students are more conscious related to oral hygiene than the pre-clinical

students. The reason may be due to the education and interaction level as they are professionally growing themselves in the field of physical therapy. The study conducted on the student of Jordan also showed similar result that at the start of the academic education in dental profession the students have less awareness related to oral health but as they progress into their academic lives they become more aware related to oral health. Moreover, their findings showed that females have more positive attitude towards oral health in comparison to males¹⁴. Another study on the dental students of Romania showed that there were considerable differences in dental health attitudes and behavior between the different academic stages of dental education and between genders¹⁵. Unfortunately, the male population in our study was very small so we

couldn't apply any statistical test. Moreover, all questions that has been asked from the students of both clinical and pre-clinical, of Karachi under Hiroshima University Dental Behavior Inventory questionnaire it is found that the clinical students are more consciously aware related to the Oral health in term of every question put forward to them and that the mean obtained for most of the question is higher for clinical students in comparison to the pre-clinical students.

CONCLUSION

Clinical DPT students demonstrated enhanced approaches towards oral healthiness behavior in comparison to preclinical students. The study also suggested that the students of Physical therapy are conscious related to their oral health. The study highlighted that the DPT students of a well-known institute of Karachi are though conscious and take good care of their oral health, however the result would not be the same for different other colleges of Karachi.

Recommendation: This study is mainly confined to one institute for DPT. We normally observed students who already take good care of their personal and social appearance. Thus, it is recommended that more surveys of this type should be performed among different other colleges and universities of Karachi where students from different other academic backgrounds like engineering, commerce etc. shall be surveyed to find out the awareness level among these students as well. Although clinical DPT students demonstrated better knowledge towards oral health hygiene but still that one obligatory to endorse a widespread oral hygiene sequencer for DPT students to start from the early weeks of their introduction to clinical field as good oral hygiene has good impact on both self-confidence and verbal communication.

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Evaluation of Heart Rate Variability and Baroreflex Sensitivity in Cesarean Spinal Delivery

Muhammad Salman Maqbool

ABSTRACT

Objective: To appraise that objective heart rate variations, can predict hypotension following block, in parturients undergoing spinal cesarean delivery.

Study Design: Observational study.

Place and Duration of Study: This study was conducted at the Anesthesia Department, Islam Teaching Hospital, Islam Medical College, Sialkot from 03-4-2012 to 18-9-2012.

Materials and Methods: One hundred and twenty eight term parturients scheduled for spinal cesarean delivery, with American Society of Anesthesiologists (ASA) physical status class 1-3 were inducted in the study. Pre-anesthetic assessment was done and informed written consent taken. Excluded were parturients with contraindications of regional anesthesia.

Results: Spearman's Rank correlation co-efficient (r) value came out to be 0.326 and significant at 0.01 level. Objective observation of heart rate variations i.e baseline and immediately following intra-theal block along with baroreceptor response (ratio of changes in heart rate to change in systolic blood pressure) were noted in 128 term parturients undergoing spinal cesarean section.

Conclusion: The objective observation of heart rate changes following spinal sympathetic block correlated with subsequent systolic blood pressure patterns, representing autonomic (sympathetic and parasympathetic) efferent influences on heart. The hemodynamic changes also guided further management, thus help in lowering severity of maternal hypotension and reducing maternal morbidity.

Key Words: Baroreflex, Spinal, Cesarean, Heart Rate

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INTRODUCTION

The maternal hypotension incidence in spinal anesthesia is said to be around 82%¹ when preventive measures are not adopted, even with the application of said techniques the prevalence still ranges from 53² to 80%³.

Historically administering intra-venous crystalloid fluids 15 to 30 minutes earlier to spinal anesthesia known as "preload" was considered as part of approach and practiced to counteract sympathetic block hypotension for many years, when first presented as part of protocol by Greiss FC Jr and Crandell DL⁴. In a randomized controlled study by Morgan PJ, Halpern SH⁵ and colleagues affirmed that incidence of maternal

hypotension associated with spinal anesthesia, employing crystalloid fluids pre-load to vary around 46%.

At present infusing intra-venous fluids at time of induction of spinal anesthesia known as "coload" is receiving particular attention as it appears physiologically more appealing in preventing post spinal hypotension as suggested by Mercier FJ, Roger-Christoph S⁶ and colleagues, in their study. In study by Ewaldsson CA and Hahn RG⁷ on volume kinetics, pushing ringer lactate solution at time of induction of anesthesia helped in better management of homeostatic levels of arterial blood pressures than a pre-load fluid use.

The incidence in central neuraxial anesthesia of profound bradycardia and cardiac arrest is stated to be around 1.5 per ten thousand cases, by contrast cardiac arrest incidence during general anesthesia is approximately 5.5 per 10,000 cases⁸. Local anesthetic agents injected into cerebro-spinal fluid cause blockade of neural transmission in posterior (somatic, visceral sensations) and anterior (efferent motor and autonomic outflow) nerve roots. The baroreceptor reflex is responsible for maintenance of arterial blood pressure so that marked changes are avoided, these changes are sensed by stretch receptors in carotid sinus and aortic

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arch, the nucleus solitarius in medulla receive impulses, via afferent signals of glossopharyngeal and vagus nerve, a rise in blood pressure elicits parasympathetic system activation and sympathetic inhibition resulting in decrease in heart rate, cardiac contractility and lower vascular resistance⁹ and vice versa. Pre-operative anxiety effect in parturients was assessed by visual analogue scale before spinal anesthesia in a study by Orbach-Zinger S, Ginosar Y¹⁰ and colleagues advocating that it projected into maternal hypotension following block. Various measures have been suggested to counter spinal attributed maternal hypotension like, fluid (pre-loading/co-loading), giving vasopressors (phenylephrine or ephedrine) and posture change¹¹.

Heart rate variability can be employed in predicting spinal induced maternal hypotension was first time-honored by Chamchad D, Arkoosh VA¹² et al in their study. Increased sympathetic drive in parturients before spinal anesthesia is associated with intra-operative hypotension following sympathetic block in cesarean section was demonstrated by Hanns R, Bein B, Ledowski T¹³ and colleagues in their study. Baroreflex sensitivity is the ratio of change in heart rate to change in systolic blood pressure and the autonomic efferent influences acting on heart rate (sympathetic and parasympathetic systems) are responsible for the said changes¹⁴.

The present study was designed to test the hypothesis, that objective observation of heart rate variations i.e. baseline and immediately following spinal block are predictive of maternal hypotension after block and guide treatment regimen and management thereby reducing incidence and severity of maternal hypotension. Baroreceptor reflex changes (pulse and blood pressure) were objectively observed following block. Additional outcome variables like vasopressor need, atropine used, maternal nausea and vomiting, fetal Apgar score¹⁵ and associated complications were noted. The vasopressor were used in study when 20% decline in systolic blood pressure occurred from baseline (or < 90mmHg) and supplemental venturi oxygen facemask were used for pulse oximeter reading <95% on air and atropine was used to treat bradycardia (heart rate of less than 50 beats/minute).

MATERIALS AND METHODS

Ethical committee approval was taken and study done from 03-4-2012 to 18-9-2012 at the Anesthesia Department of the Islam Teaching Hospital, Islam Medical College, Pasoor road, Sialkot. One hundred and twenty eight term parturients scheduled for spinal cesarean delivery, with American Society of Anesthesiologists (ASA) physical status class 1-3 were inducted in the study. Pre-anesthetic assessment was done and informed written consent taken. Excluded were parturients with contraindications of regional

anesthesia. After securing two large bore intravenous lines, standard monitors (electro-cardiograph, pulse oximetry, and non-invasive blood pressure) were attached and baseline readings noted. Sub-arachnoid block done with 0.75% hyperbaric bupivacaine in left lateral position employing standard aseptic technique and later placed supine with 15° wedge under the right hip for few minutes. The motor block was evaluated by modified Bromage scale by Breen TW, Shapiro T¹⁶ and colleagues. Neuraxial block assessment was done at one minute interval and procedure started when T6 dermatome level was attained to both cold (sympathetic) and pin prick (sensory) check. The heart rate changes were noted every 30 seconds along with blood pressure measurement every minute for fifteen minutes than at five minutes interval. After procedure hemodynamic monitoring and care of spinal anesthesia continued in post anesthesia care unit. SPSS version 19 was used for statistical analysis. Spearman's Rank correlation was employed to check interdependence (correlation) between the variables i.e. heart rate and blood pressure variations following block and significance noted at 0.01 level.

RESULTS

The mean age (years) in study being 15.91 (SD of 4.18), median and mode being 25, whereas minimum and maximum age being 18 and 40 years. The mean fetal Apgar score¹⁵ at one and five minutes was 6.9 (SD of 1.59) and 8.5 (SD of 1.90). In study vasopressor's were used in 63 (in 49.2%) and not used in 65 (in 50.7%) cases. Injection metoclopramide was given for nausea in 11 (in 8.5%) of cases. The patient's categorized in ASA grade 1, 2, 3 were 113 (88.2%), 6 (4.6%) and 9 (7.03%) respectively.

Table No.1: Atropine consumption.

	Number	Percent
Prophylactic Atropine	6	4.68
For bradycardia after block	54	42.18
For missed beats	2	1.56
No Atropine used	66	55.15

Table No.2: Hemodynamic patterns.

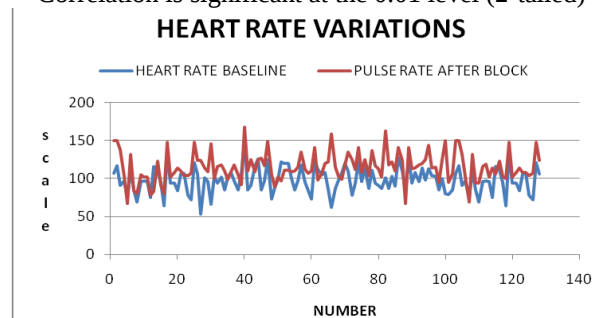
	Frequency	Percentage
Tachycardia along with hypotension	22	17.2
Bradycardia along with hypotension	2	1.6
Little or no hemodynamic change	96	75
Stable heart rate, only unopposed hypotension	8	6.3

The heart rate variation and systolic blood pressure changes baseline and following block are depicted in graph-1 and 2 respectively. Table-1 shows atropine used. The objective hemodynamic (heart rate and blood pressure) variation patterns observed in the study following block are shown in table-2. Baroreflex sensitivity heart rate (beats per minute) to change in systolic blood pressure (mmHg) variations are shown in graph-3. Spearman's Rank correlation test applied is depicted in table-3, the value of correlation coefficient (r) is .326 and correlation is significant at the 0.01 level. The total mean pre-load volume in millilitres 1551 ml (SD of 474ml), and mean dose hyperbaric bupivacaine being 13.6mg (SD of 0.54) in the study.

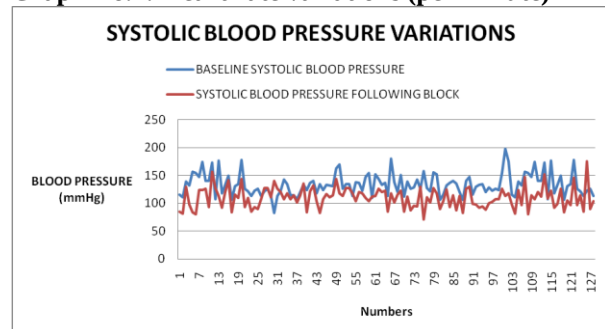
Table No.3: Spearman's Rank Correlation.

			Heart rate/ minute after block	Systolic blood pressure (mmHg) following block
Spearman's rho	Heart rate after block	Correlation Coefficient	1.000	-.326 **
		Sig. (2- tailed)	.	.000
		N	128	128
	Systolic blood pressure	Correlation Coefficient	-.326 **	1.000
		Sig. (2- tailed)	.000	.
		N	128	128

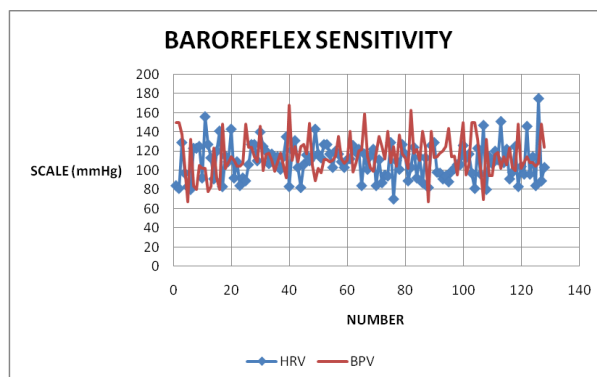
**Correlation is significant at the 0.01 level (2-tailed)



Graph No.1: Heart rate variations (per minute)



Graph No.2: Systolic blood pressure changes (mmHg).



Graph No.3: Baroreflex sensitivity.

DISCUSSION

As no autoregulation of placental blood flow exists, a decrease in maternal arterial pressure will lower its perfusion while increased sympathetic and decreased parasympathetic activity is observed in pregnancy¹⁷ though this is helpful in maintaining placental perfusion during pregnancy¹⁸ but this places parturient prone to hypotension following sympathetic block. A second highly potent endogenous vasodilator system other than arterial baroreflex is the nitric oxide system which acts through feedback mechanism stimulated by shear stress induced by high arterial pressure and is a short term regulatory system¹⁹. Mackey DC, Carpenter RL²⁰ and colleagues in their study stated, the cardiovascular reflexes involved in spinal associated sympathetic block hypotension (decreased venous return), are, pacemaker stretch reflex (decreased stretch result in bradycardia), activation of vagal reflex arcs mediated by baroreceptors, and the Bezold-Jarisch reflex²¹ (stretch receptors in the sinus node result in a paradoxical Bezold-Jarisch response). The sympathetic outflow of heart arises from cervical 5th to thoracic 5th level with main supply of heart is from thoracic 1st to 4th level. Another possible mechanism of bradycardia and asystole during spinal anesthesia is the blockade of the stated cardio-accelerator fibres this may alter balance of autonomic nervous system input to the heart resulting in unopposed parasympathetic influence on the sinoatrial and atrioventricular nodes. Brown DL, Carpenter RL²² and colleagues in their study advocated to use anticholinergic agents like atropine, and vasopressors in a step ladder pattern, when bradycardia and hypotension presents after intra-thecal block and successful resuscitation has been documented in majority of cases where atropine was used as first agent in the line of therapy²³ though in few cases if bradycardia is accompanied by hypotension, anticholinergic agent (atropine) use will put in view uncorrected hypotension to manage²⁴. Similar protocol for hemodynamic changes management following spinal block was utilized in our study as guided by observing heart rate variability changes after sympathetic block. In the study in a single case, oxygen supplementation

for respiratory distress via tight face mask assisted manual breathing was needed for a minute period. There was no neurological deficit in any case in our study in post-operative follow up.

A study by Bishop DG, Cairns C²⁵ and colleagues advocated that pre-operative heart rate variability analysis forecasts subsequent spinal block hypotension in parturients. Sakata K, Yoshimura N²⁶ and colleagues in their study stated, that changing posture along with employing heart rate variation analysis is helpful in predicting hypotension risk in parturients undergoing spinal cesarean delivery. Yokose M, Mihara T²⁷ and colleagues in a prospective observational study, evaluated pre-operative clinical value of non-invasive pulse oximetry derived variables e.g perfusion index, heart rate, etc and commented that pre-operative heart rate can be predictable of subsequent spinal associated hypotension in parturients. A related study by Toyama S, Kakumoto M²⁸ et al on prediction of perfusion index readings evaluated from pulse oximetry monitoring, stating that a high perfusion index readings correlates with lower blood pressure (hypotension) following block in spinal cesarean delivery. Jain R, Agarwal A, and Yadav S²⁹, studied blood pressure readings before spinal anesthesia in lateral and sitting position and pointed that the baseline values in lateral position correlated moderately with blood pressure readings post spinal in the supine position.

CONCLUSION

The objective observation of heart rate changes following spinal sympathetic block correlated with subsequent systolic blood pressure patterns, representing autonomic (sympathetic and parasympathetic) efferent influences on heart. The hemodynamic changes also guided further management, thus help in lowering severity of maternal hypotension and reducing maternal morbidity. A large multicenter trial at national level is need of time to assess heart rate variability analysis in prediction of post spinal hypotension.

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RECOMMENDATIONS

When appropriate, may be included.

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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.

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