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**Editorial****Let's Talk About Fitness****Mohsin Masud Jan**

Editor

This, and in the next few issues, I'll talk about fitness. Considering that I have already touched this topic before, albeit very slightly, in our June 2015 issue, I'll make this a several part topic, and go through, in depth, about fitness in general, and the trends going the rounds in our country.

First of all, let's see what fitness actually means: 'the quality or state of being fit'.<sup>1</sup> Now keep in mind that there are several types of fitness, namely, physical, mental and emotional. We, for now, we will associate ourselves with only the Physical aspect.

Physical fitness accounts for an individual's ability to carry out a specific task without unnecessary fatigue. Up until recently, fitness has largely been something that we as Pakistanis have generally kept at an arm's length, but, as of late, the tide has begun to turn. But, the rise in fitness enthusiasts in Pakistan has come after an exponential rise in obesity, westernization of our diet and love for luxury. And even though people are looking to be fit, the rise in the number of people looking to achieve a certain level of fitness, compared to the rising levels of obesity in our country remains abysmal.

There remain two integral components of fitness: diet and exercise. Regardless of what anyone claims, these two go hand in hand. Remember, you can't out train a bad diet. For now let's just start off with exercise.

For starters, let's see what science has to say about the multitude of benefits exercise has to offer:

- 1) Controls weight<sup>3</sup>
- 2) Combats health conditions and diseases<sup>3 & 5</sup>
- 3) Improves mood<sup>2, 3</sup>
- 4) Boosts energy<sup>2</sup>
- 5) Promotes better sleep<sup>3, 4</sup>

Now, going through these 5 benefits, and well, these 5 alone, who wouldn't want these? In more ways

than one, exercise is that miracle cure that humankind has sought since its creation.

For all its worth, everyone should exercise. Depending on your age and physical abilities, it could merely be a 15 minute walk or a grueling 1.5 hour long weight training session. Regardless, exercising regularly, at least 30 minutes a day, is what most experts recommend to maintain a certain level of fitness. And as far as my opinion and experience with fitness goes, I recommend everyone to exercise, even if you start off with one single step, start exercising. As time will go by, you'll get better and fitter, and once the results start showing, trust me, you'll be hooked.

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# Closed Reduction and Percutaneous Pinning in Proximal Humerus Fractures- Assessment of Results Using Constant-Murley Shoulder Scoring Scale

Mian Muhammad Azhar

Assoc. Prof. of Orthopaedic Surgery, KMS Medical College, Sialkot

## ABSTRACT

**Objective:** The aim of the study was to assess the results of closed reduction and percutaneous pinning in proximal humerus fracture using Constant-Murley shoulder outcome scoring scale

**Study Design:** Experimental study.

**Place and Duration of Study:** This study was conducted at KMSMC/AIMH and National Bones and Joints Hospital Sialkot from July 2013 to Dec 2014.

**Materials and Methods:** 20 patients having proximal humerus fractures were operated and closed reduction and percutaneous pin fixation was done. Out of 20 patients, 11 patients (55%) were male and 9 female (45%). Right side was involved in 14 patients (70%) and left side in 6 patients (30%). Age ranged b/w 30-50 years with an average age of 38.4 years. Mechanisms of injury were RTA in 10 patients (50%), fall from height 6 patients (30%), fall while walking/stair climbing 4 patients (20%). The follow up ranged from 6-18 months with an average follow up of 9 months.

**Results:** The patients were assessed postoperatively at the end of follow up using Constant-Murley shoulder outcome scoring scale. 12 patients (60%) had excellent, 5 patients (25%) good, 2 patients (10%) fair and 1 patient (5%) had poor result. The mean Constant-Murley score at the end of follow up was 88.2 points. The complications observed were; pin track infection 3 patients (15%), loosening of pin 2 patients (10%), mild fracture displacement 1 patient (5%) and shoulder stiffness 2 patients (10%). Whereas, deep wound infection, avascular necrosis, retrophic ossification and neurovascular injury were not seen in this study. All the fractures were satisfactorily b/w 8-14 weeks with an average of 10 weeks postoperatively.

**Conclusion:** Closed reduction and percutaneous pin fixation in displaced fractures of proximal humerus is safe and effective procedure with negligible complications and should be adopted as the first line of treatment if facilities are available.

**Key Words:** Proximal humerus fracture, closed reduction, pinning, Constant-Murley scoring scale.

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## INTRODUCTION

Proximal humeral fractures are the third most common fractures after hip and distal radius fractures.<sup>3,6,9,17</sup> The incidence of proximal humerus fractures typically increases after 50 years of age in women and 70 years in men. Based on recent literature the age and sex specific incidence rate of proximal humeral fractures varies from 10-300 per 100,000 people in different populations.<sup>6,17,27,40</sup>

Proximal humeral fractures account for almost 4-5% of all fractures. These fractures have dual age distribution, occurring in young individuals following high energy trauma or in older patients aged >50 years with low

velocity injuries like simple fall.<sup>1,7,24,26</sup> The management of proximal humeral fractures can be divided into 2 categories: conservative Vs surgical. Undisplaced fractures or fractures with minimal displacement and stable fractures can be treated conservatively with closed reduction and immobilization followed by early mobilization through exercise and physical therapy. Cornell<sup>8</sup>, Hawkins, et al<sup>15</sup>, Herscovici, et al<sup>16</sup>, Koval, et al<sup>26</sup>, Neer<sup>32</sup>.

Open reduction and internal fixation involves extensive soft tissue damage and there is chance of damage to the vascular supply, avascular necrosis, implant failure due to poor quality of bone, nonunion, pseudarthrosis and shoulder stiffness. Brooks, et al<sup>5</sup>, Jaberg et al<sup>21</sup>.

Various methods of osteosynthesis have been suggested for proximal humeral fractures which include: external fixation, closed reduction and percutaneous pinning, open reduction and plating either by compression plates, T-plates, phloos plate, fixed locking plate etc.,

**Correspondence:** Mian Muhammad Azhar  
Assoc. Prof. of Orthopaedic Surgery, KMS Medical College, Sialkot.  
**Cell No.:** 0300-9619977  
**E-mail:** drazharskt@gmail.com

open reduction and tension band wiring, Anterograde/retrograde nailing, hemiarthroplasty or total shoulder replacement. Each method has got its own advantages and disadvantages with different degree of complications. The purpose of intervention is to stabilize the fracture site to aid in better union, reduce pain and return to the preinjury level of activities. Failure to achieve fracture union can lead to impairment of function and weakness of shoulder muscles. Entrapment of soft tissues such as; long head of biceps tendon, deltoid muscle or neurovascular structures between the fragments is uncommon. The possibility of biceps tendon entrapment is only with 100% anterior displacement of shaft fragment. The humeral shaft fragment maybe button-hole through the capsule or the periosteum becoming entrapped in muscle and in this particular situation open reduction is indicated.<sup>2,4,5,8,9,20,21,25,27,35,38</sup>

About 80% of proximal humeral fractures can be treated conservatively. Bengner, et al<sup>3</sup>, Horak and Nilsson<sup>14</sup>, Leyshon RL<sup>30</sup>, Olerud P<sup>33</sup>, Williams GR, et al<sup>42</sup>, Fjalestad T, et al<sup>11</sup>

Plate fixation is often difficult due to multiple fragments and poor quality of bones whereas intramedullary nailing also has potential risk of violating the rotator cuff or elbow function.<sup>27,31,34,36</sup>

Closed reduction and percutaneous fixation is considered to be a reliable method in achieving good results in carefully selected patients, although it is less rigid biomechanically than the plate and screw construct, but can be used effectively in good quality bone. Percutaneous fixation technique has advantages over open reduction and internal fixation because there is no soft tissue damage and no chance of iatrogenic avascular necrosis.<sup>19,22,27,43</sup>

Unfortunately not much local data is available to ascertain the local results. This study was conducted to assess the efficacy of the procedure according to our circumstances.

## MATERIALS AND METHODS

20 patients were selected and operated upon for study at KSMC/AIMH/National hospital from July 2013 to Dec 2014. Out of 20 patients 11 patients (55%) were male and 9 patients (45%) were female. The age ranged from 30-50 years with an average age of 38.4 years. Right side was involved in 14 patients (70%) and left in 6 patients (30%). The mechanism of injury was RTA in patients (50%), fall from height 6 patients (30%), fall while walking/stairclimbing 4 patients (20%). The inclusion criteria was closed fracture; displaced or undisplaced, single or 2-3 parts fracture, whereas severely comminuted fractures with marked

osteoporosis, compound fractures, polytrauma patients along with abdominal or chest injury, patient unfit for anesthesia having different medical problems were excluded from the study. Prophylactic antibiotics were given to all the patients. In all the patients closed reduction and percutaneous pin fixation was done and were discharged on the 2nd post-operative day and were followed up; weekly for 1 month, then fortnightly for 3 months, then after every 3 months till completion of follow up. All patients were encouraged to have gentle range of motion exercises especially forward flexion and backward extension in order to avoid shoulder stiffness. K-wires were removed after 6-8 weeks of surgery depending upon the state of union. Patients were followed up from 6-18 months with an average follow up of 9 months. All patients were assessed postoperatively using Constant-Murley shoulder outcome scale as per recommendation of European Society of Shoulder and Elbow surgery (ESSES). The score system consists of 4 variables that are used to assess the shoulder function. The subjective variables include pain (15 points), activities of daily living-sleep, work, recreation (20 points) and Objective variables include range of motion-forward elevation, abduction, internal rotation and external rotation (40 points- 10 points each) and strength (25 points). The score was graded according to total points obtained by the patient taking the normal side of the patient as standard (100 points). A score b/w 85-100 was graded as excellent, 70-85 as good, 60-70 fair and <60 points as poor result.

## RESULTS

Mean Constant-Murley score of patients at the mean follow up of 9 months was 88.2 points. 14 patients (70%) had excellent, 4 patients (20%) had good, 1 patient (5%) fair and 1 patient (5%) had poor score at the end of follow up.

The fracture union time ranged from 8-12 weeks with an average of 10 weeks postoperatively. The satisfactory healing of fracture site occurred in all patients. The mean postoperative range of motion points at the end of follow up by Constant scale was 34 points (range 24-40 points). The mean forward flexion was 170° (range 120-180°) and mean abduction was 165° (range 110-180°).

The complications observed were; pin track infection 3 patients (15%), loosening of pin 2 patients (10%), mild fracture displacement 1 patient (5%) and shoulder stiffness 2 patients (10%). Whereas, deep wound infection, avascular necrosis, heterotrophic ossification and neurovascular injury were not seen in this study.



**Photographs: Closed Reduction and Percutaneous Pinning in Proximal Humerus fractures.**

## DISCUSSION

Different surgical treatments are available for the management of closed proximal humeral fractures in the literature which involve both, the non-operative as well as operative methods like open reduction and internal fixation with conventional plate, T plate, locking compression plate, Philos plate, external fixator either Hoffman type or JESS type (Joshi external stabilizing system), closed reduction and K wiring, percutaneous screw fixation or tension band fixation.<sup>1,2,4,8,12,17,20,24,25,27,33,41</sup>

Each procedure has its own limitations and complications with certain advantages over others. A major disadvantage to the nonoperative treatment is the failure to obtain early mobilization which results in high rate of shoulder stiffness and pain; Malunion and nonunion are also likely to be associated with this type

of treatment. Cordasco RH<sup>10</sup>, Hodgson SA, et al<sup>19</sup>, Jakob RP, et al<sup>22</sup>, Zyto K, et al<sup>43</sup> Fjalstad, et al<sup>11</sup> reported his results of 50 patients with 3 and 4 parts fracture humerus in which he compared the results of conservative treatment with angular stable interlocking implants. According to his report after 12 months follow up there was no significant difference inbetween the two groups. However, there were certain limitations in his study which include small sample size and short follow up.

Zyto R, et al<sup>43</sup> compared conservative treatment with tension band osteosynthesis in type 3 and 4 part fractures of proximal humerus. He reported that optimal functional ability was regained within first 12 months although the follow up period lasted for 5 years. The main complications noted in his study were in the surgical group, in which despite improved positioning and reduction, the functional outcome as measured by



subjective assessment of function at 12 months and at final follow up was not different b/w the two groups.

The disadvantage of open internal fixation is difficulty in achieving rigid fixation in osteoporotic, cancellous bone of proximal humerus. Similar problems are also encountered in case of severe comminution in relatively young patients as well. Cortical bone in osteoporotic and comminuted situation provides weak purchase to the screws. Presence of comminution provides difficulty to internal fixation and there is increased chance of complications due to hardware loosening and pull out of screw. Moreover there is extensive soft tissue dissection, blood loss, more chance of avascular necrosis and more joint stiffness which leads to poor results.<sup>5,7,10,20,24,27,29</sup>

Use of external fixators like Hoffman have also been reported by many authors but due to bulky Steinmen pins, increased risk of soft tissue injury, intra-articular penetration and moreover limited space for the application of pins in different planes has limited its use. The JESS (Joshi external stabilizing system) has also been reported in which small K wires are used in different planes which add to rotational stability to reduce fracture and has lower risk of soft tissue, neural and vascular injury.<sup>5,8,12,34</sup>

Stableforth, et al<sup>39</sup> reported his results of 32 patients treated with hemiartoplasty Vs conservative treatment. According to his report; the results of surgical intervention were better as compared to conservative treatment using closed reduction and sling application at 6 months follow up with reference to pain and power. In the literature implant failure and loss of primary fixation have been reported in 2.7 to 13.7% of cases following open reduction and internal fixation using locking plates in proximal humeral fractures. Recent trend is shifting away from open reduction and internal fixation to closed reduction and percutaneous fixation as this method has definite advantage of being less invasive, less soft tissue damaging and with a lower complication rate. Another complication associated with ORIF is the increased risk of avascular necrosis of humeral head due to the impairment of anterior circumflex humeral artery and consecutive devascularization of humeral head which leads to functional impairment. Percutaneous pinning is the best alternative to other operative treatments.<sup>2,10,21,28,29,31,36,42</sup>

In our study the mean Constant-Murley score was 88.2 points at the mean follow up of 9 months with 14 patients (70%) having excellent, 4 patients (20%) good, 1 patient (5%) fair and 1 patient (5%) poor results. Overall 90% of the patients were satisfied with this procedure. Kettler et al reported a constant score b/w 52-72 points with ORIF using Philos plate whereas, Hunter et al reached a mean Constant score of 55 points. Rosa et al<sup>37</sup> reported a Constant score b/w 33-84 points using two elastic smooth pins inserted through.<sup>24,25,37</sup>

Pin track infection was the most common complication observed in this study. We noted loosening of pin in 2 patients, fracture displacement (1-2mm) in 1 patient,

shoulder stiffness in 2 patients; whereas other complications like wound infection, avascular necrosis, nonunion, were not observed in the study.

## CONCLUSION

Displaced proximal humeral fractures can be treated with closed reduction and percutaneous pin fixation successfully with excellent results. It is the safe and effective method with negligible complications and should be adopted as the first line of treatment if facilities are available.

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

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# Comparison of Efficacy and Safety of Magnesium Sulphate in 12 Hours Versus 24 Hours After Last Fit in Eclamptic Patients

1. Shahid Irshad Rao 2. Uzma Shaheen 3. Syeda Hussna

1. Assoc. Prof., 2. Senior Registrar, 3. Postgraduate Trainee, Department of Obstetrics & Gynaecology, Unit III, Nishtar Medical College & Hospital Multan

## ABSTRACT

**Objective:** To compare the efficacy & safety of magnesium sulphate in 12 hours regime versus 24 hours regime after last fit in eclamptic patients.

**Study Design:** Randomized controlled trial study

**Place and Duration of Study:** This randomized controlled trial was carried out at Department of Obstetrics and Gynaecology, Unit-III, Nishtar Medical College/Hospital Multan from 01.06.2013 to 31.05.2014.

**Materials and Methods:** Total 120 patients with eclampsia were included. All patients were given 4g of magnesium sulphate (20% solution) intravenously slowly (15 mins) as loading dose. After receiving the loading dose randomization was performed by block design. So 60 patients for 12 hour regime while 60 patients for 24 hour regime (control group). In 12 hour regime group magnesium sulphate maintenance dose of 1g (20% solution) was given 1 hourly intravenously for 12 hours after last fit. In 24 hour regime group magnesium sulphate maintenance dose of 1g (20% solution) was given 1 hourly intravenously for 24 hours after last fit. Efficacy in shape of recurrence of fits, number of fits and safety in shape of pulmonary oedema, oliguria and loss of knee jerk reflex, Nausea and flushing was noted.

**Results:** Total 120 patients were studied falling in age group of 20 to 40 years. Eclampsia was most commonly occurring in young and primigravida patients. Majority of eclamptic patient had diastolic B.P 110 or > 110mmHg. None of patients in either group had eclamptic fit. Loss of knee jerk reflex seen in 5 patients in 24hrs regime group. Minor side effects were more commonly observed in 24hrs regime group.

(n=38) of the students were underweight and 36 % (n=21) were obese.

**Conclusion:** Twelve hours regime is equally effective as 24 hours regime but with lesser side effects & so more cost effective. 12hours regime was observed to promote shorter hospital stay decreasing work load.

**Key Words:** Magnesium Sulphate, Eclampsia, Efficacy, Safety

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## INTRODUCTION

Eclampsia is a greek word meaning "to shine forth" or "flash of lightening".<sup>1</sup> Eclampsia is defined as the occurrence of fits in association with other clinical features of pre-eclampsia, excluding convulsions of co incidental neurological disorder such as epilepsy or metabolic & other organic causes.<sup>2,3</sup>

Eclampsia is an important modifiable cause of maternal mortality and morbidity worldwide and in particular in countries of low socioeconomic conditions.<sup>4,5</sup>

Eclampsia has become rare in developed countries but in low & middle socioeconomic countries where appropriate or prompt intervention are not available delay in seizer treatment results in hypoxic brain damage resulting in maternal and neonatal mortality and morbidity. According to world health organization

pre-eclampsia and eclampsia is the second leading direct cause of maternal morbidity and mortality following postpartum haemorrhage in under developed countries.<sup>6</sup>

In 1925  $MgSO_4$  was introduced into clinical practice to control fits in cases of eclampsia.<sup>7</sup> It is an anti convulsion drug, approved by the WHO as cost effective and safe drug available for management of severe pre-eclampsia and eclampsia.<sup>8</sup>

Its exact mechanism of action is unclear. it is thought to treat eclampsia by producing cardiovascular and neurological effects, which are induced by its interaction with calcium homeostasis.<sup>9</sup> According to some studies magnesium sulphate causes vasodilatation, protects blood brain barrier by decreasing cerebral edema so acts as cerebral anticonvulsant.<sup>10</sup>

$MgSO_4$  is generally administered parenterally in a loading dose by intravenous route or intramuscular route, It is followed by maintenance dose (by continuous IV infusion or intermittent IM injections). The two most commonly used regimens are the Zuspan

**Correspondence:** Dr. Shahid Irshad Rao,  
Associate Professor, Department of Obstetrics &  
Gynaecology, Unit III Nishtar Medical College/Hospital  
Multan  
**Cell No.:** 03008732882  
**E-mail:** drshahidrao@hotmail.com



regimen (a loading dose of 4 g IV, and maintenance dose of 1 g/hr IV) and the Pritchard regimen (loading doses of 4 g IV and 10 g IM or maintenance dose of 5 g IM/4hr).<sup>11,12</sup>

Despite the strong evidence for the efficacy of magnesium sulphate, its safety is still questionable, particularly in clinical environments where the facilities for patient monitoring are limited. These concerns can limit the initiation and maintenance of MgSO<sub>4</sub> therapy for all women where indicated.<sup>13,14</sup>

Ekele and his associates<sup>15</sup> has reported in a study that a short dosage therapy of magnesium sulphate was effective in controlling fits in 92.6%. Sahu and his associates<sup>16</sup> has also reported in a recent study that 12 hours therapy had almost same results like that of treatment with MgSO<sub>4</sub> 24 hours after last convulsion in terms efficacy and safety.

Tasnim and her associates<sup>17</sup> has reported in a recent comparative study comparing 12 hours therapy versus 24 hour therapy that there was no recurrence of fits in both therapies while no difference was found regarding pulmonary edema and oliguria.<sup>17</sup> The various studies performed on different dosage regimes have shown that 12 hours MgSO<sub>4</sub> therapy is equally effective versus 24 hours regime with simultaneous reduction in side effects. Our study was planned on basis of existing data with a hope that 12 hours regime will reduce the work load of tertiary care hospital and will prove more safe.

## MATERIALS AND METHODS

This randomized controlled trial was conducted at Department of Obstetrics and Gynaecology, Unit-III, Nishtar Medical College/Hospital Multan. Total 120 patients with eclampsia were enrolled in study. All patients were given 4g of magnesium sulphate (20% solution) intravenously slowly (15 mins) as loading dose. After receiving the loading dose randomization was performed by block design. 60 patients for 12 hour regime while 60 patients for 24 hour regime (control group). In 12 hour regime group MgSO<sub>4</sub> maintenance dose of 1g (20% solution) was given 1 hourly intravenously for 12 hours after last fit. In 24 hour regime group it was given as a maintenance dose of 1g (20% solution) per hour intravenously for 24 hours after last fit. Efficacy in shape of recurrence of fits, number of fits and safety in shape of pulmonary oedema, oliguria and loss of knee jerk reflex, Nausea and flushing was noted.

## RESULTS

Of 120 patients 60 patients were assigned to each group. It was found eclampsia occurring more commonly in young (Table 1), nulliparous woman with first pregnancy and least frequent in multipara woman (Table 2). Moreover it was more common in antepartum patient as compared to intrapartum or post partum patient (Table 3). Majority of these patients had

diastolic B.P 110 or >110 mmHg (Table 4). Regarding maternal outcome in terms of recurrence of fits No patient in either group has fit. 5 patients in 24 hours group developed loss of knee jerk reflex. No patient in either group had respiratory or renal failure. Regarding minor side effects nausea and flushing was observed more commonly in group having 24 hrs regime of MgSO<sub>4</sub>.

**Table No.1: Percentage of patients according to age**

Age (years)	12 Hours Group A	24 Hours Group B
20-24	33 (55%)	35(58.3%)
25-29	14(23.3%)	10(16.6%)
30-40	13(21.6%)	15(25%)

**Table No.2: Frequency and percentage of gravidity & parity**

Gravidity & parity	12 Hours Group A	24 Hours Group B
G <sub>1</sub> P <sub>0</sub>	46(76.6%)	44(73.3%)
G <sub>2</sub> P <sub>1</sub>	05(8.3%)	4(6.6%)
G <sub>3</sub> P <sub>2</sub> or more	09(15%)	12(20%)

**Table No.3: Percentage of type of eclampsia**

Type of eclampsia	12 Hours Group A	24 Hours Group B
Ante Partum	43(71.6%)	41(68.3%)
Intra Partum	03(5%)	2(3.3%)
Post Partum	14(23.3%)	17(28.3%)

**Table No. 4: Percentage of blood pressure**

Blood pressure	12 Hours Group A	24 Hours Group B
90 or Less	06(10%)	04(6.6%)
91-100	07(11.6%)	09(15%)
101-110	13(21.6%)	15(25%)
>110	34(56.6%)	32(53.3%)

**Table No.5: Frequency of recurrent fits**

Recurrent fits	12 Hours Group A	24 Hours Group B
Recurrent of Fits	0(%)	0(%)
No of fits	0(%)	0(%)

**Table No.6: Frequency of major and minor side effects**

Major side effects	12 Hours Group A	24 Hours Group B
Loss of Knee Jerk Reflex	0(%)	05(8.3%)
Respiratory Failure (Pulmonary Oedema)	0	0
Renal Failure (Oliguria)	0	0
Minor		

**Table No.7: Frequency of minor side effects**

Minor side effects	12 Hours Group A	24 Hours Group B
Nausea	1 (1.6)	7 (11.6%)
Flushing	3 (5%)	11 (18.3%)

## DISCUSSION

Efficacy & Safety of magnesium sulphate in eclamptic women is time tested & supported by various studies. Eclampsia was found to be particularly common in young pregnant patients, in age range of 20-24 years (55-58.3%).<sup>18</sup> It was found predominately a disease of primigravidas (73.3-76.6%). Our study also showed similar results.

Most of the patient with eclampsia developed fits in antepartum period (71.6%)<sup>19</sup>. The study contradicting to these finding was by Douglas.<sup>20</sup> Mostly patients (53.3 - 56.6%) had very high blood pressure at the time of their presentation suggesting it is a risk factor for development of fits but convulsions can also occur without previous history of hypertension.<sup>18</sup> As Ekele and his colleagues<sup>15</sup> reported that ultrashort regime of MgSO<sub>4</sub> was effective in controlling recurrent of fits in considerably high proportion of patients while in our study it is effective in 100% of cases. Regarding toxicity our study showed loss of knee jerk reflex in 5 patients (8.3%) and nausea in 7 (11.6%) and flushing in 11(18.3%) patients in group receiving 24hrs regime. No patient had loss of knee jerk reflex in 12 hours group. Nausea & flushing was seen only in 1 (1.6%) and 3 (5%) patients respectively in 12hours group. These results are supported by a study in india in 2010 in which low dose magnesium sulphate was associated with lower toxicity.<sup>21</sup>

## CONCLUSION

Twelve hours regime is equally effective as 24hours regime but with lesser side effects & so more cost effective. 12hours regime was observed to promote shorter hospital stay decreasing work load.

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

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# Significance of Sonographic Characterization and FNAC of Small Size Thyroid Nodules

1. Tanweer Ahmad 2. Nadeem Mehmood Butt 3. S.M.Nasir Qadri

1. Asstt. Prof. of Radiology, PGMI/Ameer ud Din Medical College Lahore 2,3. Consultant Radiologists, Deptt. of Diagnostic Radiology SIMS/Services Hospital Lahore

## ABSTRACT

**Objective:** The purpose of this study is to determine the accuracy of various ultrasound characteristics of small size thyroid nodules in the predication of malignancy and the usefulness of ultrasound guided FNAC of these nodules.

**Study Design:** Experimental / analytic study.

**Place and Duration of Study:** This study was carried out at Radiology Department Services Hospital, Lahore from October 2011 to September 2012.

**Materials and Methods:** This study was conducted on 70 patients, in whom 76 thyroid nodules 4mm to 10mm in size were biopsied. Diagnostic ultrasound was performed with high frequency linear probe for the evaluation of following ultrasound characteristics, internal structure, echogenicity, margins, posterior acoustic shadowing, height to width ratio, halo around the nodules, calcifications and vascular flow on Doppler scan. Each character was correlated with the results of FNAC to determine the accuracy of the feature in the prediction of malignancy.

**Results:** Out of 76 FNACs of 4mm to 10mm size thyroid nodules 8(10.5%) biopsies did not yield significant cytological specimen. Another 8(10.5%) specimen were classified as indeterminate so no further analysis was done. The rate of malignancy among nodules on final diagnosis was 20%. The most accurate sonographic features associated with malignancy were posterior acoustic shadowing (88.1%), taller than wider (83%), Halo around the nodule (80%) and calcification (70%).

**Conclusion:** Small size thyroid nodules are associated with significant risk of malignancy. Certain sonographic characteristics can be used to measure the risk of malignancy. FNAC of these nodules can be safely and accurately performed with high diagnostic rate.

**Key Words:** Thyroid Nodules, Sonographic features, Fine needle aspiration biopsy

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## INTRODUCTION

The thyroid gland nodules are a common medical problem seen in 4-7% of patients on clinical examination, 10-67% on thyroid ultrasound and 50% at autopsy.<sup>1,2</sup>

Rate of malignancy of these nodules on FNAC is 9.2-14.8 %<sup>2</sup>. The over all prevalence of thyroid cancer is 3.6%.<sup>3</sup> The management of large size thyroid nodules is clearly defined<sup>4</sup>. But there is controversy for the smaller size nodules, how best to approach the small size nodules. It is suggested by the experts that suspicious features on ultrasound seems to merit for ultrasound guided fine needle aspiration biopsy.

The aim of this study is to determine the usefulness of the evaluation of thyroid nodules up to 10 mm in size. It will compare ultrasound features with pathological results to determine the rate of malignancy in small size nodules.

## MATERIALS AND METHODS

In this study 70 patients including male and female of the age 25 to 80 years were evaluated consecutively referred to the radiology department Services Hospital Lahore from October 2011 to September 2012. In these entire patients at least one nodule up to 10 mm in greatest diameter was biopsied. Patients with total and partial thyroidectomy and diagnosed cases of thyroid cancer were excluded from the study.

High frequency (7.5-10 MHz) linear ultrasound probe was used for the thyroid scanning and aspiration of nodules was done with 25 gauge needles. Ultrasound guided fine needle aspiration was performed by qualified and experienced radiologists. The size of the nodules biopsied ranges from 4mm to 10mm. If repeat aspiration failed to yield an adequate specimen, then 22 gauge needles were used to obtain adequate aspirate. It was spread on slides and air dried. The average no. of passes was 2 +\_0.8. The final cytological results were classified according to the Bethesda thyroid system (5), Unsatisfactory, benign, indeterminate and malignant (including suspicion for malignancy). No serious

**Correspondence: Dr. Tanweer Ahmad,**  
Assistant Professor of Radiology PGMI/ Ameer ud Din  
Medical College Lahore.  
**Cell No.: 0300-4249182**  
**E-mail: drtanweer22@gmail.com**

complications except minor bleed and or pain was noted.

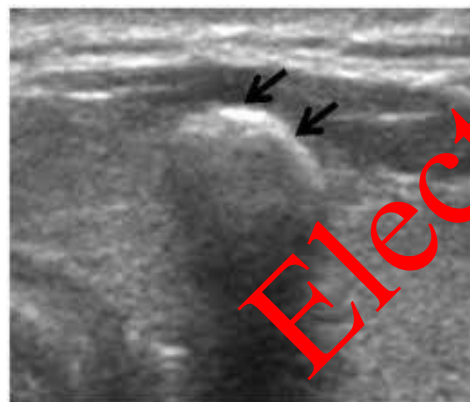
All patients with malignant cytological results were referred for surgical resection.

The ultrasound images of small size thyroid nodules were evaluated for the following characteristics, internal structure (solid / cystic/ mixed), echogenicity (iso/hypo/hyperechogenic), margins (Defined/ ill-defined), height to width ratio, presence of calcification (micro/macrocacification/few /many/ none), vascular flow on Doppler scan, Posterior acoustic shadowing and peripheral halo around the nodules. Images were analyzed independently, in case of discrepancy consensus was reached by mutual discussion between radiologists.

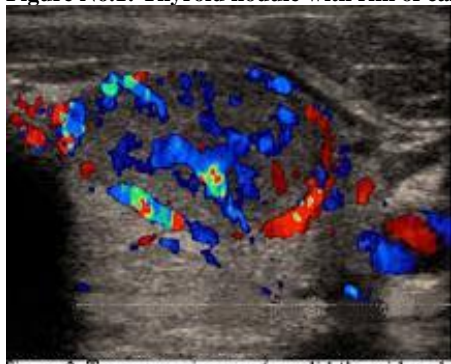
## RESULTS

This study was conducted on 70 patients having thyroid nodules Up to 10 mm in greatest diameter. These patients were scanned with high frequency linear ultrasound probe and sonographic characteristics of each nodule were recorded. FNAC of 76 thyroid nodules was performed. In 6 out of 70 patients 2 nodules up to 10 mm in size were biopsied.

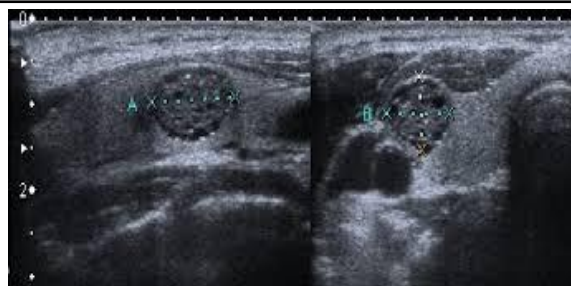
Out of 76 biopsies 8 (10.5%) did not yield significant cytological specimen and were excluded from the study. Another 8 (10.5%) nodules were classified as indeterminate, so no further analysis was done and excluded from the study.



**Figure No.1: Thyroid nodule with rim of calcification**



**Figure No.2: Thyroid nodule with increased vascularity**



**Figure No.3: Malignant Thyroid nodule**

**Table No.1: Sono Graphic Features of up to 10 mm size malignant and Benign Thyroid Nodules.**

Sono Graphic Features	Malignant Nodules (n=12)	Benign Nodules (n=48)
(1)		
(a) Solid	12(100%)	30 (62.5 %)
(b) Partially Solid/	0	18(37.5%)
(2) Echogenicity		
(a) Hypo echoic	11 (92%)	39 (81 %)
(b) Iso/	1 (8%)	9 (19%)
(3) Margins		
(a) Ill defined	9 (75%)	14 (30 %)
(b) Well defined	3 (25%)	34 (70 %)
(4) Posterior Acoustic Shadowing		
(a) Present	9 (75%)	4 (8%)
(b) Absent	3 (25%)	44 (92 %)
(5) Dimensions		
(a) Taller than	6 (50%)	5 (11%)
(b) wider than tall	6 (50%)	43 (89 %)
(6) Halo		
(a) Present	5 (40%)	5 (11 %)
(b) Absent	7 (60%)	43 (89%)
(7) Calcification		
(a) Present	10 (84%)	16(33%)
(i) Micro	7	3
(ii) Macro	1	6
(iii) Rim	1	4
(iv) Diffuse	1	3
(b) Absent	2 (16%)	32 (67%)
(8) Vascular Flow		
(a) Present	10 (83%)	24 (50 %)
(b) Absent	2 (17%)	24 (50%)

In total 60 nodules included in this study were satisfactorily biopsied with 25/22 gauge needles. 92 % of the patients were having solitary nodule while only 8 % presented with more than one small size nodules. The frequency of sonographic features between malignant and benign nodules is shown in Table 1. The accuracy data on the bases of ultrasound features for the detection of malignant nodules is shown in Table 2. No single feature except purely solid structure was most common in malignant than in benign nodules (100% vs?? %) The frequency of hypo echoic nodules was more common in malignant than benign (92% vs 81%) as were the taller than wide (50% vs 11%).

Presence of posterior acousting shadowing (75% vs 8%), halo around the nodule (40% vs 11%), and ill-defined margins (75% vs 30%). Presence of any calcification (84% vs 33%) was also significant. Doppler study revealed the vascular flow in (83% vs 50%).

Malignant nodules were significantly linked to the presence of any type of calcification. The presence of diffuse microcalcifications was more accurate feature.

By contrast features with high specificity included taller than wider shape (90%) or a halo around the nodule (90%).

Those features that did not show statistical significance but were more common in malignant than in benign nodules included hypo echogenicity (91%) sensitivity and (18%) specificity, and presence of vascular flow 84% sensitivity vs 50% specificity.

**Table No. 2: Diagnostic Index of ultrasound Features of Malignant Thyroid Nodules.**

Sr. No	Sonographic Features	Sensitivity %	Specificity %	Positive Predictive Value %	Negative Predictive Value %	Diagnostic Accuracy %	Odds Ratio
1	Solid structure	100%	37.5	28.5	100	50%	7.2
2	Hypoecho-genicity	91.6	1837	22	90	34%	2.5
3	Margins (III defined)	75	70.8	39.1	92	72%	7.2
4	Post, acoustic Shadowing	75	92	70	94	88.3%	33
5	Taller than wider	50	90	55	88	83%	8.6
6	Halo	42	90	50	86	80%	6.2
7	Calcification	84	67	38.4	94	70%	10
8	Vascular flow	84	50	30	92.3	57%	5

## DISCUSSION

Guide lines for the biopsy of larger thyroid nodules (>10mm) are recommended in the literature<sup>4,7,8</sup>. With marked improvement in technology and advent of high resolution / high frequency probes the sub centimeter thyroid nodules are well visualized. But its management is somewhat over looked. One possible reason is technically difficult biopsy of small size nodules. Some authors have found that biopsy of smaller nodules results in poor rate of diagnostically significant biopsy material<sup>9,10</sup>. Others have shown similar rate of success in FNACs in larger and smaller nodules.<sup>10,11</sup> In this study we have achieved about 90% rate of diagnostic biopsy. This rate is higher than generally mentioned in literature which range from (67-81%)<sup>1,9,12-15</sup>. In another study adequate biopsy rate of nodule smaller than 5mm was achieved<sup>16</sup>.

Another reason to neglect sub centimeter size nodules is the belief that smaller nodules have lesser risk of malignancy. But it is shown in the literature that cutoff of 10mm have no clinical justification<sup>1,2,12-14</sup>. Rate of malignancy varies in different studies from as low as 3% to as high as 15%. Several studies have shown significantly higher rate of malignancy in small size nodules than in large size nodules<sup>11,12,14</sup>. Further more it is seen that aggressiveness of malignant thyroid tumor is independent of its size including smaller than 10mm<sup>2,13,17-20</sup>.

In our study rate of malignancy was 21%. This is attributed to higher rate of malignancy due to accurate selection of nodules for biopsy. Certain ultrasound

features helped the radiologist in the selection of nodules for biopsy and yielded a high malignancy rate.

The suspicious characteristics which require biopsy in sub centimeter nodules are hypoechoic solid structure<sup>13</sup>, indistinct margins, taller than wider<sup>2</sup>, presence of micro or macro calcification and intra nodular vascular pattern<sup>14</sup>. On the basis of odds ratio the most suspicious ultrasound character were posterior acoustic shadowing (odds ratio 33), purely solid structure (odds ratio 7.2) many diffuse calcifications (odds ratio 10) and taller than wider (odds ratio 8.6).

It was noted that calcification of benign nodules are few in number as compared to malignant nodules in which calcifications are many and diffuse. All these features in conjunction with those suggested by other studies can guide the radiologist to choose the small size nodules more accurately for further work up.

## CONCLUSION

It is concluded that small size thyroid nodules (≤10mm) in size are associated with high risk (20%) of malignancy. Ultrasound characteristics including solid structure, microcalcification, taller than wide and posterior acoustic shadowing can be used to merit the smaller nodules for biopsy with high suspicion of malignancy.

Considering all above features radiologist should rely on his own impression for the selection of patients for biopsy.

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



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# Status of PM&DC Recognized Research Journals of Khyber Pakhtunkhwa, Pakistan

1. Saidul Abrar 2. Saadullah Afridi 3. Rizwan Anwar

1. Asstt Prof. of Community Medicine, WMC, Abbottabad 2. Asstt Prof, SIHS Sarhad University Peshawar

3. Asstt Prof. of Community Medicine, FMC, Abbottabad

## ABSTRACT

**Objective:** The objective of this study was to know the status of PM&DC recognized journals in Khyber Pakhtunkhwa.

**Study Design:** Descriptive/cross-sectional study.

**Place and Duration of Study:** This study was carried out in the Department of Community Medicine, WMC, Abbottabad from January 2015 to April 2015.

**Materials and Methods:** A self administered structured questionnaire was designed. Data obtained on eight sampled journals was analysed manually, tables and figures constructed using MS Excel 2007. Latest issues of journals provided by the respondents and literature review were used as additional sources of data. Frequencies of variables like number of issues, publication fee, recognition, accessibility, qualifications of managing team, and ethical approval of researches were calculated.

**Results:** One journal was indexed by MedLine, which was recognized by HEC, PM&DC and CPSP as well. Six out of eight journals had both chief editors and managing editors from clinical sciences. None of the journals had an Impact Factor. All journal hold a publication fee.

**Conclusion:** In KP, medical journals need improvement in terms of recognition, indexation, research publication ethics, publication fee and online availability and a uniform recognition criteria by HEC, PM&DC and CPSP is missing.

**Key Words:** Medical Journalism, Journal Impact Factor, MedLine

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## INTRODUCTION

A journal is an academic magazine published at regular intervals and contains research articles written by experts in a particular field of study. With the advent of Evidence Based Medicine (EBM) medical journals became even more popular and scaled up. The quality of these journal is mostly judged through impact factor, indexation and peer review. Impact Factor (IF) is regarded as a widely accepted tool having objectivity<sup>2</sup>. The idea of IF was devised by Eugene Garfield in 1955, which is the number of times articles/items from a journal published in previous 2 years are cited in the current year divided by the number of articles published in that journal during those 2 years<sup>3</sup>. Institute for Scientific Information (ISI) Philadelphia, also known as Thomson Scientific<sup>2</sup> or Thomson Reuters, publishes Journal Citation Report (JCR) since 1975 in which IF of journals is reported<sup>3,4</sup>.

Indexation has become the most controversial topic due to the presence of many popular indexation services. The oldest of these is Index Medicus, which started its publication in 1879 by John Shaw Billings<sup>5</sup>

under the present day National Library of Medicine (NLM), Maryland. MEDLINE is an electronic version of that publication and in 1997, it was made freely available through a new system called PubMed<sup>6</sup>. Other indexation services are also available which include Index Medicus of the World Health Organization for the six regions (ie African Region, Region of the Americas, South-East Asia Region, European Region, Eastern Mediterranean Region, and Western Pacific Region), EMBASE, SCOPUS, EBSCO Publishing's Electronic Databases, SCIRUS, Caspur, DOAJ, Expanded Academic ASAP, Genamics Journal Seek, Hinari, Index Copernicus, Open J Gate, Primo Central, Pro Quest, SCOLAR, SIIC databases, Summon by Serial Solutions, Ulrich's and International Periodical Directory<sup>5</sup>. But the unresolved debate is that which one should be regarded as a token of true quality. By far the most widely used indexation service is PubMed/MedLine. There are many examples where a journal having IF is not indexed with PubMed/MedLine and vice versa<sup>5,7</sup>.

In Pakistan, medical journals are recognized by three bodies; Higher Education Commission (HEC), Pakistan Medical & Dental Council (PM&DC) and College of Physician & Surgeons Pakistan (CPSP). It is mandatory for a medical journal to be registered with HEC and PM&DC<sup>8,9</sup>. Currently, there are 48 journals listed by HEC as recognized, including two biology, a biochemistry and a clinical psychology journals;

**Correspondence:** Dr Saidul Abrar,  
Department of Community Medicine,  
Women Medical College Abbottabad.  
**Cell No.:** 0321-9103569  
**E-mail:** abrardr@yahoo.com.

majority being medical journals, 72 journals are listed by PM&DC and 10 by the CPSP<sup>10,11,12</sup>. All CPSP listed ten journals are PM&DC recognized and are given Index Pakistan (IP) Number by the PM&DC<sup>11</sup>. HEC classifies its recognized journals into four categories; W, X, Y, and Z<sup>13</sup>. Journals included in JCR and having an IF are classified as category "W".

A journal without an IF but with peer review by at least one expert in the respective discipline from an academically advanced country is categorized "X".

A journal without IF and without being reviewed by an expert from academically advanced country but having other HEC journal recognition criteria like being abstracted /indexed internationally by the HEC recognized agency is placed in category "Y".

A journal that has all HEC journal criteria except IF, expert peer review from academically advanced country, being abstracted /indexed internationally by the HEC recognized agency, is placed in category "Z". Publication in category "Z" journals is acceptable only for Basic Pay Scale (BPS) appointments and publication of PhD research work on languages only<sup>13</sup>.

After 30 June 2016, only those journals having an IF will be considered as HEC recognized journals.

In Khyber Pakhtunkhwa (KP), new medical colleges, both in public and private sectors are continuously being established. Medical faculty publish their researches for academic, promotion and appointment purposes in PM&DC recognized journals published from the province but we could hardly find any study on the status and quality of these journals. This study was conducted with the objective to know the status of PM&DC recognized journals in KP.

## MATERIALS AND METHODS

This cross sectional survey was conducted from 1<sup>st</sup> January 2015 to 31<sup>st</sup> April 2015. A list of all PM&DC

recognized journals of KP was obtained from PM&DC web site. All those journals listed but ceased to publish from KP were excluded. A total of eight journals were sampled out after excluding two. A structured, self administered questionnaire was designed and filled from the chief editor, managing editor or editor of each journal by visiting each of them by research associates. Information on publication frequency, publication fee, recognition, accessibility, reviewers, qualifications of managing team, and ethical approval of researches was obtained. Respondents were requested to provide a current issue of their respective journal for further analysis like checking online availability and authorship criteria. Being feasible, data analysis was done manually while graphs and tables were constructed using MS Excel 2007. Ethical approval was granted by the Ethical Review Board of the Women Medical College Abbottabad.

## RESULTS

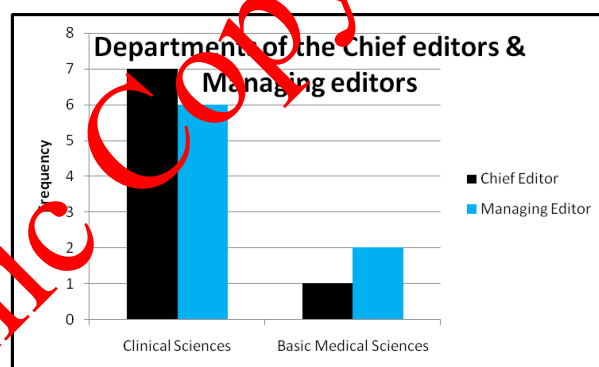


Figure No.1: Departments of the Chief editors and Managing editors.

Table No.1: Characteristics of PM&DC recognized journals of Khyber Pakhtunkhwa\*.

Name of Journal	IP#	IF	HEC category	MedLine/ IMEMR Indexation	CPSP recognition	Online availability of Articles
Journal of Postgraduate Medical Institute, LRH, Peshawar	12	Nil	X	Nil	No	All articles
Journal of Medical Sciences, KTH, Peshawar	16	Nil	Y	IMEMR	No	Last one missing
Journal of Ayub Medical College, AMC Abbotabad	25	Nil	Y	MedLine	Yes	All articles
Gomal Journal of Medical Sciences, D.I.Khan	30	Nil	Y	IMEMR	No	All articles
Khyber Journal of Medical Sciences (KJMS), Peshawar	55	Nil	N.A	N.A	No	18 articles missing
Khyber Medical University Journal (KMU-J), Kohat	60	Nil	X	IMEMR	No	All articles
Journal of Khyber College of Dentistry, Peshawar	63	Nil	N.A	IMEMR	No	All articles
Journal of Saidu Medical College, Swat	64	Nil	N.A	N.A	No	Not available

\*Information based on literature review<sup>10-12</sup>, Journal issues and data provided by respondents.

Five out of eight journals were fully available online while one was partially available and another one was completely missing (Table:01).

Only one journal had both its chief editor and managing editor from the department of Basic Medical Sciences

(Community Medicine) and another one had only its managing editor from Basic Medical Sciences (Physiology). Rest of the journals had both its chief editors and managing editors from clinical sciences (Figure:01). Journal with both its chief editor and



managing editors from Basic Medical Sciences is the only journal which is not only recognized by all the three bodies i.e PM&DC, HEC, CPSP but also indexed by MedLine (Table:1).

There is no uniform criteria set by different journals; some journals published with the same frequency and same indexation have different submission fee. All but one journal allegedly ensured ethical approval of the research prior to publication (Table:2).

**Table No.2: Frequency of Journals against different Variables**

Variables	frequency (n=08)
Respondents:	
Managing Editors	06
Editors	02
IP # provided by Respondents	
Correct	02
Incorrect	05
None	01
Frequency of Publication	
Biannually	03
Quarterly	05
Ethical approval ensured	
Yes	07
No	01
Reviewers are not members of the editorial board and keep on changing from issue to issue	08
Vancouver style followed for citation	08

## DISCUSSION

Eight journals recognized by Pakistan Medical & Dental Council (PM&DC) are published from Khyber Pakhtunkhwa. Out of these eight, three journals are not listed by the Higher Education Commission (HEC) of Pakistan<sup>10</sup>. One journal is recognized by the College of Physicians and Surgeon Pakistan (CSPS) and indexed by MedLine as well. Two journals did not provide information about their indexation while one reported being indexed by bodies other than MedLine and Index Medicus of the Eastern Mediterranean Region (IMEMR). Indexation by the NLM and WHO is considered a standard in this study by virtue of its popularity.

None of the journals has an Impact Factor and according to HEC, will not be considered HEC recognized beyond June 30, 2016<sup>10</sup>. Online availability is an important attribute and regarded mandatory by the PM&DC for recognition of a journal<sup>14</sup>. It facilitates different organizations to verify articles and authorship if someone claims credit.

## CONCLUSION

Research background of the managing team can add to the prestige and recognition of a Journal. In KP, medical journals need improvement in terms of

recognition, indexation, research publication ethics, publication fee and online availability. Fate of these journals after June 2016 can't be predicted in terms of recognition by HEC at this point in time. Recognition by a single body alone does not make a journal prestigious and the establishment of new medical colleges and medical universities both in the public and private sector will lead to launch of further research journals. A uniform criteria may be adopted by all the three bodies (PM&DC, HEC, CPSP) in order to standardize research journals in the province so that a journal recognized by one body may be considered authentic by other bodies as well.

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

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# Comparing the Quality of Life by Using Two Therapeutic Approaches (10% Sulphur Ointment and 5% Permethrin Cream) in Scabies Patients

1. Farah Asad 2. Bahram Khan Khoso 3. Fatima Rizvi

1. Asstt. Prof. of Pharmacology and Therapeutic, JMDC, Karachi 2. Asstt. Prof. of Dermatology, JPMC, Karachi

3. Asstt. Prof. of Pharmacology and Therapeutic, JMDC, Karachi

## ABSTRACT

**Objective:** To compare the quality of life by using two therapeutic approaches (10% sulphur ointment and 5% permethrin cream) in patients with scabies.

**Study Design:** Retrospective / comparative study.

**Place and Duration of Study:** This study was conducted in Basic Medical Science Institute and Dermatology Department of Jinnah Postgraduate Medical Centre in Karachi from 1<sup>st</sup> Dec 2010 to 30<sup>th</sup> May 2011.

**Materials and Methods:** This study sample consisted of 130 (4 dropped out) clinically diagnosed cases of scabies divided into two groups; A and B. Each group was further subdivided into three age groups. Group A was asked to apply 5% permethrin cream on day 0 and to be repeated after 15 days and Group B treated with 10% sulphur ointment for three consecutive nights and repeated on day 15. Data was gathered by a questionnaire. Patients follow up was done on days 3, 15 and 30 and quality of life was determined on day 0 and 30 by using Dermatological Life Quality Index.

**Results:** Quality of life was found to be low in scabies patients and treatment with 10% sulphur ointment and 5% permethrin not only improved clinical symptoms but also their quality of life significantly.

**Conclusion:** Scabies affects quality of life because of severe itching and lack of sleep and proper topical therapy significantly improves clinical symptoms and quality of life.

**Key Words:** Scabies, quality of life, 10% sulphur ointment, 5% permethrin cream.

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## INTRODUCTION

Scabies is very common skin condition caused by *sarcoptes scabiei* variety *hominis*. It has been known since ancient time like Napoleon who seems to have suffered from the itch.<sup>1</sup>

Although scabies is common disease of children but any age group of either gender can be involved. No socio-economic or ethnic groups is spared.<sup>3,4</sup> The global prevalence is around 300 million cases every year. It is more common in developing countries and it affects people at large.<sup>5</sup> Patients with HIV and other immune compromised diseases are commonly and severely affected because of lack of immunity.<sup>6</sup>

Patient's quality of life is severely affected by this disease.<sup>7</sup> Scabies is included in six parasitic skin diseases of epidermis (EPSP).<sup>8</sup>

Different environmental conditions and geographical location affects the pattern of skin diseases. Varieties of

skin diseases prevail in cities like Karachi because of poor sanitation standards, hot and humid weather, pollution, and uncontrolled growth of population.<sup>9</sup>

Misdiagnosis and improper treatment by the General physician are the major causes of its spread and developing of resistance to different therapies.<sup>10</sup> Thus patient's ability to work and quality of life are severely affected because of long and inadequate treatments.<sup>11</sup> Among many topical preparations available for scabies, permethrin is effective and well tolerated with minimal systemic absorption (2%).<sup>12,13</sup> It causes mite paralysis by prolong depolarization as it acts on voltage dependent Na-channel and causing extended opening.<sup>14</sup> Sulphur is widely used in dermatology and has antibacterial, antifungal and keratolytic activity.<sup>15</sup> Sulfur is safe in infant, children and pregnancy.<sup>16</sup>

## MATERIALS AND METHODS

This was an open label study which was conducted in Basic Medical Sciences Institute and Dermatology Department after ethical approval by ethical Committee of JPMC, Karachi. Diagnosed cases of scabies by a

**Correspondence:** Farah Asad,

Asstt. Prof. of Pharmacology and Therapeutic, JMDC, Karachi

Cell No.: 0336-2597288

E-mail: asad-farah@hotmail.com

consultant dermatologist were recruited for this trial. Informed written consent was taken from participants of this study and their relatives before completing detailed questionnaire. After applying inclusion and exclusion criteria, patients willing to participate were screened out and were divided into 3 age groups.

Following was the inclusion criteria; 1) Nocturnal pruritus, 2) Confirmed cases of scabies of either sex, 3) Age >5 years and < 70 years, 4) Patients having lesions at the classical sites or presence of burrows, 5) Family history of similar disease. Those patients who fulfilled 3 or more above mentioned criteria were eligible to be enrolled for this study.

Patients having Norwegian scabies or who had received any form of treatment for past 1 month, pregnant/ lactating women, those having concurrent illness, like diabetes, hepatic impairment or any dermatological, cardiovascular and neurological diseases were excluded.

Two groups of patients were formed. Subjects in first group were asked to apply 5% permethrin cream overnight for 14 hours and to repeat the same after 15 days and other group applied 10% sulphur ointment for three consecutive nights for 24 hours and then reapplied the same after 15 days for one more night. The quality of life index was determined on the day 0 before the application of the topical treatment. Subjects were followed on the day 15 when another application of either therapy was repeated. On day 30, patients were reexamined and reassessed for Dermatological life quality index. Subjects were fully explained about the disease, how to apply the topical treatments, treating other members of family and close contacts and about cleaning clothes and bedding in boiling water. They were also advised to avoid any other local therapies during study period.

Visual analog scale was used to judge the response of the treatment, and Dermatological life quality index was used to determine quality of life as proposed by Findlay and Khan for adults (1993) and Lewis-Jones and Finlay for children (1994). Its score ranged from 0 to 30 and it composed of 10 items.

**Statistical analysis:** SPSS software Ver.11.0D was used to analyze different data.

## RESULTS

In Group A, 64 patients (one dropped out) and group B, 62 patients (3 dropped out) completed the study. These patients were further sub divided into 3 age groups, 1. A1 /B1- 5-25 years, 2. A2/B2- 26-45 years and 3. A3/B3- 46-70 years age groups.

In group A, 55 (84.4%) of patients and in group B, 48 (75.0%) were free of disease at the end of therapy.

The mean of Dermatological life quality index was  $15.5 \pm 0.50$  and  $15.2 \pm 0.36$  in group A and B respectively at day 0. When reassessment of Dermatological life quality index was done at day 30, it

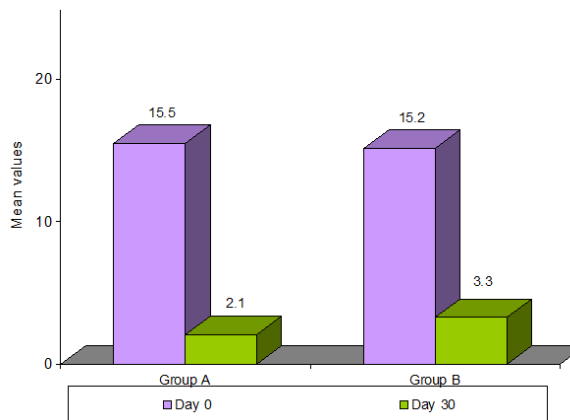
was found to be decreased to  $2.1 \pm 0.63$  in group A and  $3.8 \pm 1.56$  in group B. Statistically there was no significant difference between mean DLQI of both groups at day 0 and 30.

**According to age groups:** The Mean DLQI in scabies patients was  $18.2 \pm 0.64$  and  $16.1 \pm 0.58$  in group A1 (24 patients) and group B1(22 patients) respectively at day 0. At day 30 the mean DLQI was decreased to  $2.3 \pm 1.08$  in group A1 and  $3.8 \pm 1.56$  in group B1.

In group A2 (20 patients) the mean DLQI was  $15.6 \pm 0.79$  at day 0 and  $16.4 \pm 0.48$  in group B2 (20 patients) and at day 30 the mean DLQI decreased to  $2.1 \pm 1.16$  in group A2 and in group B2 the mean was  $3.3 \pm 1.32$ .

**Table No.1: Comparison of dermatological life quality index (dlqi) of scabies patients on day-0 and day-30 in group A and group B**

		Group A Permethrin Cream (n=64)	Group B Sulfur Ointment (n=62)	
		Mean $\pm$ SEM	Mean $\pm$ SEM	P-value
<b>Quality of life</b>				
<b>QOL</b>	Day - 0	$15.5 \pm 0.50$	$15.2 \pm 0.36$	0.602
	Day - 30	$2.1 \pm 0.63$	$3.3 \pm 0.79$	0.263
<b>Quality of life according to age group</b>				
5-25 years	Day - 0	$18.2 \pm 0.64$	$16.1 \pm 0.58$	N.S.
	Day - 30	$2.3 \pm 1.08$	$3.8 \pm 1.56$	N.S.
26-45 years	Day - 0	$15.6 \pm 0.79$	$16.4 \pm 0.48$	N.S.
	Day - 30	$2.1 \pm 1.06$	$3.3 \pm 1.32$	N.S.
46-70 years	Day - 0	$12.0 \pm 0.64$	$12.9 \pm 0.46$	N.S.
	Day - 30	$1.9 \pm 1.06$	$2.6 \pm 1.22$	N.S.



**Figure No.1: Comparison of dermatological life quality index (dlqi) in treatment group A and group B**

In group A3(20 patients) the mean DLQI at day 0 was  $12.9 \pm 0.64$  and  $12.9 \pm 0.46$  in group B3(20 patients), and at day 30 the mean DLQI was  $1.9 \pm 1.06$  in group A3 and  $2.6 \pm 1.22$  in group B3.

There was no significant difference in all above subgroups between mean DLQI at day 0 and at day 30.



## DISCUSSION

Physical, functional, emotional and social well being of an individual is included in Health related Quality of life.<sup>17</sup> The Dermatology life Quality Index (DLQI) is a tool which is used for routine clinical evaluation, clinical decision making and research purpose.<sup>18,19</sup>

Scabies is a major health related problem affecting population at large in under developed countries and is highly contagious in nature. Lack of hygiene, overcrowding and poor sanitation conditions are conducive for its spread.<sup>20,21</sup> Scabies in certain societies can lead to social stigmas. It can affect quality of life of an individual affecting his life style and working. Sulphur ointment was used in one study. It not only cured the disease but also improved the quality of life.<sup>22</sup>

Permethrin which is commonly prescribed treatment and is drug of choice,<sup>23</sup> has not been studied as for as improvement in quality of life is concerned hence it was chosen for this trial to observe any change in quality of life in patients with scabies before and after treatment. For this DLQI tool was used. One patient was lost for follow up. 54 (84.4%) patients were treated successfully thus this study indicated the effectiveness of the drug on the all stages of mite (ova, larvae, and adult).<sup>24</sup> Similar result with permethrin was also reported in another study.<sup>25</sup> The mean of Dermatology Quality Life Index (DLQI) was observed to be  $15.5 \pm 0.50$  on day 0 in all of our patients which was significantly improved after treatment with 5% permethrin cream. Similar results with some variations were also observed in another study.<sup>26</sup> Permethrin was reported to have no systemic side effects with good tolerance by patients. It was effective as majority of patients were cured.<sup>27,28</sup>

10% sulphur is another effective local therapy for scabies. Its effect on quality of life by using Dermatology Life Quality Index was also observed on patients.<sup>29</sup> In total 62 patients completed the study. 48 (75.0%) patients got benefit which showed that it too was also effective therapy. Our results were similar as have been found before with 10% sulphur.<sup>30</sup> There was no significant difference when both groups were compared. Our results were with accordance with another study which found that both sulphur and permethrin act against any emerging immature stages of the mites.<sup>31</sup> Sulphur is the oldest, very effective, cheap and safe antiscabietic in use and is available in various preparations.<sup>32,33</sup> In this study we determined that scabies has profound effect on patients quality of life which got better after effective treatment. The symptoms of scabies which affects the quality of life such as deterioration of sexual, emotional and psychological wellbeing; all these undesirable effects of scabies were improved in present study after scabiecidal treatment. There are no trails which assessed the quality of life in scabies patients by 5%

permethrin cream but indirect relation to improve the symptoms of disease was explained in one study.<sup>34</sup> Another study in which evaluation of quality of life was assessed by using 10% sulphur ointment found that it improved the quality of life by curing the disease.<sup>35</sup> This present study showed that both treatments were safe and there was no significant difference statistically between both treatments. Other studies also reported same result.<sup>36,37</sup> Nocturnal itching associated with scabies disturbed patients sleep during night thus reducing health related quality of life during day time as we observed in present study as well as reported in the studies done in the past.<sup>38,39</sup>

## CONCLUSION

From this study we concluded that quality of life is largely affected in patients suffering from scabies which can be brought back to normal with 5% permethrin cream which effectively treat this disease.

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

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# A Cross Sectional Survey to Determine the Effect of Consuming Regular Breakfast on BMI in Medical Students of Jinnah Medical and Dental College

1. Fadielah Adnan Sohail 2. Zeba Saeed 3. Bushra Bilal

1. Asstt. Prof. of Medicine, JM&DH, Karachi 2. Asstt. Prof. of Community Health Sciences, JM&DH, Karachi

3. Lecturer of Medicine, Inaya Medical College, Riyadh

## ABSTRACT

**Objective:** The objective of this cross sectional survey was to determine the effect of consuming regular breakfast on BMI in medical students of Jinnah Medical and Dental College.

**Study Design:** Cross sectional study

**Place and Duration of Study:** This study was conducted among the medical students of Jinnah Medical and Dental College, Karachi, from April 2014 to August 2014.

**Materials and methods:** The sample comprised of all the students of first to fourth year MBBS students. 374 students actually became the part of our study. The data was collected using a pre tested and pre coded questionnaire. The data was analyzed by using SPSS version 20.0

**Results:** Our study reveals that 43% (n=161) were the regular breakfast consumers compared to 57% (n=213) who were irregular breakfast eaters. From this regular breakfast consumers 63.2% (n=102) had normal BMI and 36.8% (n=59) had deviant BMI. From this deviant BMI group 64% (n=38) of the students were underweight and 36% (n=21) were obese.

**Conclusion:** The findings of our study support earlier research which suggests that regular breakfast consumption helps to keep our BMI within normal range.

**Key Words:** Regular Breakfast, BMI, Medical Students

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## INTRODUCTION

Human body gets the first nourishment of the day in the form of a wholesome breakfast. It is a healthy habit to have it regularly due to many advantages which are part and parcel of a healthy breakfast. To begin with, it is shown to have positive health benefits with regards to cognitive abilities. Since cognitive, and physical wellbeing along with academic performance are dependent on each other, therefore any variation in one factor may affect the outcomes of other factors. Therefore we can assume that breakfast not only affect the cognitive outcomes of an individual, but may also impact the overall behaviour and psychosocial function of an individual. Those of us who regularly consume breakfast are more likely to have optimal nutrients intake along with fulfillment of most of the daily requirement of micro nutrients. It has been scientifically proven by research that regular breakfast consumers have enhanced academic performance, decreased body

fat and healthier dietary habits, contributing to better mental, physical and social functioning of individuals<sup>1,2,3,4,5,6,7</sup>. It is not only that breakfast consumption is important but its regularity also plays a very important role in achieving desired health status.

However, there is also a salient feature attached to breakfast consumption that is the particular quality of food which an individual choose to take as breakfast. It has been validated by a number of many such studies that those consumers who take ready to eat cereals, 100% fruit juices, grains and low fat milk had a lower Body Mass Index<sup>8,9,10</sup>.

Body Mass Index (BMI) is a very useful tool in calculating the level of obesity and figuring out whether someone is simple overweight or obese, as it takes into account the weight and height of an individual. However, it is considered as a preliminary reference as it does not take into account the fact that every person has a different amount of fat deposition within the body which basically means that every person is different with different dietary needs and metabolic tendencies<sup>5,11</sup>.

A healthy breakfast should be comprised of carbohydrates, proteins, fats, fibre, micro nutrients etc. It is very well known that increase in protein intake also

**Correspondence:** Zeba Saeed,

Asstt. Prof. of Community Health Sciences, JM&DH, Karachi.

Cell No.: 03158772725

E-mail: zebasaeed437@gmail.com



manifests itself as a good glycemic regulator. In some studies, school breakfast programmes have shown positive cognitive achievements, and the ones who benefited most were the ones who were initially poorly nourished or who consumed less breakfast. This experience of a healthy and regular breakfast in childhood and adolescence provides the child with higher chances of having a normal weight and reduced disability in their adulthood<sup>1,4,5,10,11,12,13</sup>.

A number of studies indicate that skipping breakfast have a negative impact on health and it also leads to the consumption of more energy dense food at lunch along with more insulin availability at that time. Diet quality reduction with low levels of calcium in men and lower calcium, iron and fiber in women is also noticed in breakfast skippers. It is also recognized in these studies that breakfast skippers poses detrimental health consequences as the act promotes chances of being overweight and experiencing obesity in most of the countries and cultures worldwide<sup>9,14,15,16,17,18,19,20,21,22</sup>.

Increase in the amount of unusual or uncontrolled fat that damages the health of an individual is identified as being overweight and obese. The basic cause of obesity is the increased intake of energy rich food with decreased intake of fruits and vegetables. Studies have shown that individuals who habitually skip breakfast are more likely to follow a sedentary lifestyle, which may further lead to health problems like hypertension, diabetes, obesity etc. On the other hand decreased physical activity, urbanization and change in society contribute to the development of obesity<sup>11,14</sup>.

Genetic research has also participated in finding out linkages in the overweight and obesity phenomenon with fruitful results in European and South-East Asian Populations. Genes have a positive contribution toward insulin secretion, etiology of obesity, energy metabolism and lipid biology<sup>23,24,25,26</sup>.

Data published by World Health Organization in January 2015 shows alarming facts which suggest that the number of cases exhibiting obesity has doubled since 1980. In 2014, 1.9 billion adults were overweight and from these 600 million were obese. It is interesting and significant to note that a larger chunk of the population living in those countries where being underweight and malnourished is assumed to be more prevalent, it turns out that obesity and overweight people are more likely to die as a result of it. This shows how the immense magnitude of the problem that this condition poses<sup>14</sup>.

It is an acknowledged fact that medical students are more prone to suffer from stress and fatigue due to immense burden of their educational course and this may in turn lead to adaptation of unhealthy life styles. Several studies have pointed out that poor dietary habits and skipping breakfast is a prevalent phenomenon among medical students, which may affect their academic performance and their general wellbeing as a

whole<sup>27,28</sup>. This study was therefore undertaken to observe the effects of skipping breakfast on the BMI of medical students in a private medical college in Karachi.

## MATERIALS AND METHODS

This cross sectional study was conducted among the medical students of Jinnah Medical and Dental College, Karachi. The sample comprised of all the students of first to fourth year MBBS students. The total number of students from first to fourth year came out to be 412, out of which 374 actually responded to our questionnaire. The duration of the study was from April 2014 – August 2014, and the data was collected during the months of May and June 2014.

Despite an extensive literature search, we could not find a uniform definition of 'Regular Breakfast'. Therefore for the purpose of our study, regular breakfast consumers were defined as 'individuals who consume breakfast at least five out of seven days a week'. For this particular study 'Breakfast' was defined as 'meal eaten in the morning comprising of health and nutritional food'. This healthy food could be anything, ranging from bread slice, egg, cereal, a cup of milk or paratha. However, a mere cup of tea was not regarded as a healthy breakfast.

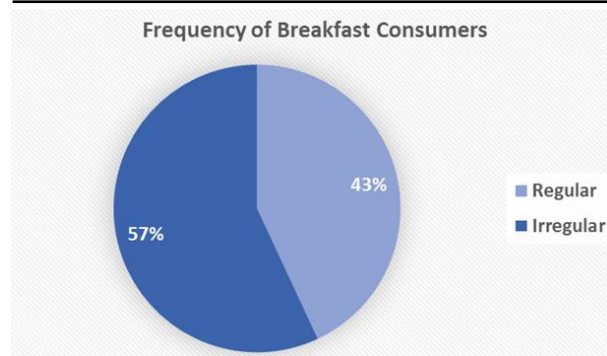
For calculating Body Mass Index, the heights and weights of the students were measured subsequently by the data collectors, and the BMI was calculated by using the formula:  $BMI = kg/m^2$ .

Ethical consideration was taken into account. Prior consent was obtained from all the students who volunteered to be a part of this study. The students were assured of confidentiality of their information. The data was collected using a pre tested and pre coded questionnaire. The data was analyzed by using SPSS version 20.0

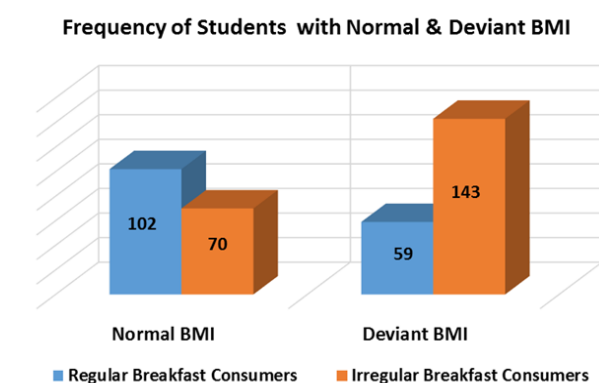
## RESULTS

Out of total number of students from first till fourth year that is 412, a sample  $n=374$  consented to participate. 43% ( $n=161$ ) were the regular breakfast consumers compared to 57% ( $n=213$ ) who were irregular breakfast eaters. From this regular breakfast consumers 63.2% ( $n=102$ ) had normal BMI and 36.8% ( $n=59$ ) had deviant BMI, from this deviant BMI group 64% ( $n=38$ ) of the students were underweight and 36% ( $n=21$ ) were obese.

From the irregular breakfast consumers 33% ( $n=70$ ) had normal BMI with respect to 67% ( $n=143$ ) whom BMI was deviant. From this deviant BMI set of students 69% ( $n=99$ ) were obese and 31% ( $n=44$ ) were underweight. 65% ( $n=243$ ) of the students skip breakfast because they did not have enough time in the morning. 25% ( $n=94$ ) were not to have breakfast since very young age.



**Figure No.1: Frequency of students who consume the breakfast**



**Figure No.2: Frequency of regular and irregular breakfast consumers with their BMI**



**Figure No.3: Frequency of Variety of food consumed as Breakfast by Students**

## DISCUSSION

Breakfast is usually considered to be the most vital meal of the day, which helps in immediate achievement of optimal energy requirements of the human body<sup>1</sup>. However, it is also the mostly skipped meal of the day as well. Its importance cannot be denied especially when it comes to health and development of children and adolescents. The particular way that the regular pattern of breakfast consumption affects human body and influences Body Mass Index (BMI), is still unclear.

Although a number of studies have been conducted to suggest and support a positive relationship between breakfast consumption and its impact on general health and wellbeing<sup>2,4,5,9</sup>. However, there is lack of data on the appropriate 'healthy' breakfast, therefore a single uniform definition of breakfast is unavailable to standardize research on this topic. This particular study was undertaken to observe the effects of regular breakfast consumption on the BMI of medical students. The results of our study show that 43% (n= 161) of the medical students were regular consumers of breakfast. Of these regular consumers, majority of the students had their BMI within normal ranges. Whereas, only 36.8% (n= 59) had their BMI, which were deviated from the normal BMI range. Interestingly, 64% (n= 38) of such subjects were underweight, while 36% (n=21) were obese. This finding is consistent with certain other studies conducted nationally and internationally<sup>3,8,9,18,29</sup>.

On the other hand, among those students who did not consume breakfast regularly, only 33% (n=70) had normal BMI. Whereas, 67% (n=143) had their BMI deviant from normal BMI range. Of these, 69% (n= 99) were found to be obese and 31% (n= 44) were underweight. Similar results have been observed in a number of other such studies<sup>2,3,15,16,19</sup>. The possible explanation of this increased BMI in irregular breakfast consumers may be that they tend to over eat at other meals, as the nutritional requirement of the body is not met by skipping breakfast in the morning<sup>1,9,17,20</sup>.

Despite skipping of breakfast, majority of the students were aware that skipping breakfast can have deleterious impact on their physical and mental wellbeing, and may affect their cognitive and learning capabilities.

When the students, who skip breakfast, were enquired about the reasons for not taking breakfast various reasons were mentioned, ranging from non-availability of time to lack of appetite. Majority of the students 65% (n= 243), who skip breakfast replied that they do not get adequate time in the morning to have their breakfast, otherwise they fear of getting late from the college. 25% (n= 94) mentioned that they are not used to of having breakfast in the morning since very young age, and they do not have the appetite for food so early in the morning. These finding are consistent with another study conducted with medical school students in Ghana. Students who were habitual of skipping breakfast also affirmed that since they do not take breakfast at home, so they take something, usually junk food, from the college cafeteria<sup>30</sup>. This could explain the reason for obesity among those who do not take regular breakfast.

## CONCLUSION

The findings of our study support earlier research which suggests that regular breakfast consumption helps to keep our BMI within normal range. In general, regular consumption of breakfast is associated with favourable

health and nutritional outcomes, and skipping breakfast may lead to obesity.

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

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# Descriptive Analysis of Alleged Rape/Sexual Assault Incidents in Rawalakot, AJK

1. Naseer Ahmed Ch. 2. Syed Mudassir Hussain 3. Muhammad Khalid Mehmood

1. Assoc. Prof. of Forensic Medicine, Poonch Medical College, Rawalkot 2. Assoc. Prof. of Forensic Medicine, KEMU, Lahore 3. Lecturer, Forensic Medicine, Poonch Medical College, Rawalkot

## ABSTRACT

**Objective:** To describe the socio-demographic along with the medico-legal characteristics of rape assailants and victims reporting to a police station in Rawalakot, Azad Kashmir.

**Study Design:** Retrospective study.

**Place and Duration of Study:** This study was carried out at Forensic Medicine Department, Poonch Medical College, Rawalkot Jan 2007 to April 2015.

**Materials and Methods:** This was a retrospective cohort study in which a total of 67 cases of alleged rape victims were identified while reviewing all available police files concerning reported rapes and attempted rapes from 2007 to 2015. The data was gathered on preformed questionnaires after conducting the pilot study. All information about victims and alleged offenders were extracted from the police files including socio-demographic profile of the both the accused and victim i.e age of the victim and assailant, marital status of assailant and victim, time of incident, number of accused persons and whether challan was filed or otherwise.

**Results:** A total of 67 cases were collected from the police records regarding the alleged rape cases. Maximum number of victims belonged to age group of 21 to 30 years and most offenders also belonged to same age group. 70.1% (n=47) of victims and 79.1% (n=53) of assailants were unmarried. In most of the cases, one offender was involved while gang rape constituted 6% (n=4) of cases. Most cases were reported between 1200-1800 Hrs followed by 0600-1200 Hrs. The total no of cases year wise are 4 in 2007, 1 in 2008, 7 in 2009, 5 in 2010, 13 in 2011, 5 in 2012, 11 in 2013, 13 in 2014 and 5 in first 4 months of 2015.

**Key Words:** Rape, Victims, Assailant, Incidence, Rawalakot

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## INTRODUCTION

Rape is a type of unlawful sexual activity and usually sexual intercourse carried out forcibly or under threat of injury against the will usually of a female or with a person who is beneath a certain age or incapable of valid consent. The act may be carried out by physical force, coercion, abuse of authority or against a person who is incapable of valid consent such as one who is unconscious, incapacitated, or below the legal age of consent.<sup>1</sup> The term rape is sometimes used interchangeably with the term sexual assault.

Rape, the most common sexual assault on women, is not a medical diagnosis as commonly known but a legally well-defined crime and usually occurring unwitnessed with testimony of the victim and assailant carrying more weightage. In spite of stringent measures taken against sexual crime, incidence of rape continuous to rise unabated all over the globe. Fifty one of every 1,00,000 females in America were raped with one woman being raped every nine minutes<sup>2</sup>. According

to lawyer Asma Jahangir, who is a co-founder of the women's rights group Women's Action Forum, up to seventy-two percent of women in custody in Pakistan are physically or sexually abused<sup>3</sup>. In 1979, Pakistan passed into law The Hudood Ordinance according to which all the extramarital sexual acts, including the rape, were considered crime against the State. Since 2000, various women and teenage girls have begun to speak out after being sexually assaulted<sup>4</sup>. Going against the tradition that a woman should suffer in silence, they have lobbied news outlets and politicians. WHO in 2003 issued guidelines for medico-legal care for victims of sexual violence, which emphasize the need for physical as well as psychological care for victims of rape.

The rape doesn't only inflict physical trauma on the victim, which is not appreciable in most cases, but it also puts the victim in psychological delirium, which differs in intensity from one victim to another. The social norms and local customs refrain her from unveiling her woes to the law enforcement agencies and legal system. Hence, the reported cases of alleged rape are actually just the tip of the iceberg that is dealt by the Law. As the trend of rape has increased in recent years, there is a dire need of analyzing the social factors and anthropology of rape, and to better comprehend the preventable factors that govern this devastating

**Correspondence:** Naseer Ahmed Ch.

HOD/Assoc. Prof. of Forensic Medicine, Poonch Medical College, Rawalkot

Cell No.: 03334358875

E-mail: dr.naseer.ahmed.ch@gmail.com

nuisance, in order to hamper its incidence in the days to come.

## MATERIALS AND METHODS

This was a retrospective cohort study, conducted at Police Station Rawalakot, AJK. The study of cases included all the alleged rape victims who reported this event in that police station over a period of past eight and a half years from Jan 2007 to April 2015. A retrospective review of all police files was done to collect data regarding rape incidents. All rape cases reported as homicide or suicide were excluded from the study. A preformed Performa was filled while reviewing each case file. All data concerning the socio-demographic and medicolegal profile of both the victim and accused was noted including age of the victim and assailant, marital status of assailant and victim, time of incident, number of accused persons and whether challan was filed or otherwise.

Descriptive statistics were analyzed for frequency distribution of various variables using SPSS version 20. One-tailed and two-tailed tests of significance were applied to find out the statistical association between ages and marital status of victim and accused and P-value was fixed at 0.05 to assess the significance of the results. Rest of the results were given in the form of descriptive statistics.

## RESULTS

A total of 67 alleged rape victims were identified during Jan, 2007 to Apr, 2015. The victim's age ranged from 11 years to 40 years. The maximum number (n = 37, 55.2%) of rape cases occurred in 21-30 years of age group followed by 22 victims (32.8%) in the 31-40 years age group. Maximum number of the accused were between 21-30 years constituting 58.2% (n = 39) of the total. Correlation was significant at 0.01 level (2 tailed test of significance using both Pearson and Kendell tau-b correlation co-efficient) found between the age groups of victim and accused. Table I shows the age distribution of victim and accused.

**Table No.1: Age Distribution of victim and accused**

Age group	Victims		Offender	
	Frequency	%age	Frequency	%age
11-20 yrs	8	11.9	-	-
21-30 yrs	37	55.2	39	58.2
31-40 yrs	22	32.8	28	41.8
Total	67	100	67	100

Forty Seven (47) of rape victims were unmarried which constituted (70.1%) of the total and only 20 (29.9%) were married. Similarly 79.1% (n=53) of assailants were unmarried while 20.9%(n=14) were married. This shows that most of the victims and assailants were unmarried.

**Table No.2: Marital status of victim and accused**

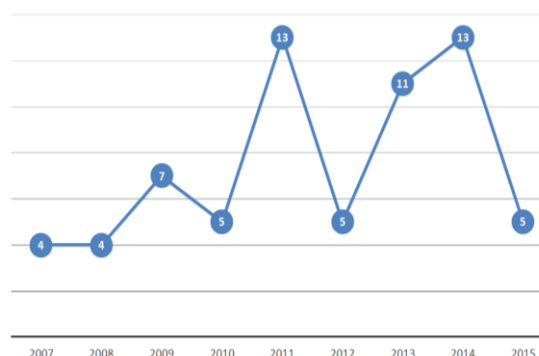
Marital status	Victims		Offender	
	Frequency	%age	Frequency	%age
Unmarried	47	70.1	53	79.1
Married	20	29.9	14	20.9
Total	67	100.0	67	100.0

In 04 cases (6%), number of accused was more than one (gang rape) and in rest of 63 cases (94%), the accused and victim ratio was one to one as shown.



**Figure No.1: No. of Offenders**

Regarding the timing of reporting of these incidents, maximum no. of cases were reported in between 1201 to 1800 hours (n=30) followed by 0601 to 1200 Hours(n=18). In nine(9)cases, there was no record of time.



**Graph: Yearly incidences of cases**

The yearly incidence of cases is shown by the following graph. It shows a sudden rise in cases of sexual assault in 2011 with sudden drop in 2012. After this, the incidents rose again and the trend continued (Note: The total no of cases depicted in 2015 are only upto April).



## DISCUSSION

The incidence of sexual assault on women is on the rise globally despite of an increase in awareness among masses due to electronic and print media and NGOs; both due to a lack of strict legislature against this crime and even more importantly, lack of proper implementation of such laws. Everyday somewhere in the world, one out of every three women are either beaten or sexually assaulted. According to UN Commission's report on the status of women, in USA, despite the presence of strictly followed legal system, a woman or girl is being raped every three minutes<sup>5</sup>. Similarly, *Forbes women* report on India shows that a woman is being sexually assaulted once every twenty minutes<sup>6</sup>.

Ours was a retrospective study conducted in the town of Rawalakot where the local records from the local police station of Rawalakot were inspected and the cases were sorted out. For the span of 8 and a half years, a total of 67 cases were collected by non-random purposeful sampling, starting from Jan, 2007 to April, 2015. Out of 67 cases, maximum number of victims belonged to age group of 21-30 years i.e. 55.2% (n=37), followed by 31-40 years (32.8% n=22). Rape victims' ages have been reported to range from a minimum of 93 days to a maximum of 86 years with mean age of 17.5 years as indicated in a study published in 2006 in journal of clinical forensic medicine<sup>7</sup>. The same trend was found in the age group of offenders with maximum lying in 21-30 age group bracket followed by 31-40 years.

Most of the victims were unmarried i.e. 70.1% (n=27), while 29.9% were married (n=2); which was comparable to the study conducted in Lahore in 2010 where 74.3% of victims were unmarried<sup>8</sup>; this shows that the unmarried group is more prone to sexual assaults than married, more so if they lie in age group of 21-30 years. This is in accordance to previous studies where most of the victims were unmarried; even in one study none of the victim was married<sup>9</sup>. Similarly in our study, most of the offenders were also unmarried constituting 79.1% (n=53) cases, while the rest 20.1% were married. This shows that the sexual frustration that compels these assaults, lie in those who are unmarried and young i.e. 21-30 yrs. Most of the cases were reported between 1201 to 1800 hrs i.e. n=30, followed by 0600 to 1200 hrs i.e. n=12, in rest of the cases, the time of report was not recorded. In this study, 94% (n=63) cases, single offender was involved, while rest of cases were gang rapes. While in France it was noted that a single assailant was involved in the majority of the cases<sup>10</sup>. In a survey by United Nations, 14% of Italian women had experienced attempted rape and 2.3% had experienced rape in their lifetimes<sup>11</sup>.

In our study, the incidence of rape remained low and constant from 2007 to 2010. It suddenly rose in 2011 and this trend continued till the end of our study in April 2015 where 5 cases have already been reported in the first 4 months of the year showing a continuity of rise in the no of cases.

## CONCLUSION

Rape victims usually belong to young age group between 21-30 years while offenders belong to 31-40 age group, majority of them being unmarried. Also the number of cases each year are on the rise and the trend needs to be discouraged by strict implementation of rules given in Hudood Ordinance 1979 and women protection bill 2004 by the law enforcement agencies.

**Suggestions:** There is an urgent need for specialist training for law enforcement personnel, prosecutors, forensic experts and judges to ensure physical and evidentiary examination, including pelvic examination, is warranted in all cases of female sexual assault presenting within 36 hours of the assault, as observed from the lack of available records in the respective fields. The lack of availability of proper sexual education also merits a proper organised inclusion in the curriculum, so that a proper awareness can be given regarding such sensitive issue in an optimistic way, moreover the parents should also be educated in term of how to guide their siblings in this regard. Specialist centres that can provide both treatment for the survivors of sexual assaults and meet criminal justice requirements with respect to the collection of forensic evidence.

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

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# Frequency of live Births in Patients with Unexplained Recurrent Abortions Treated with low Molecular Weight Heparin and Aspirin

1. Uzma Shaheen 2. Shahid Irshad Rao 3. Syeda Hussna

1. Senior Registrar, 2. Assoc. Prof. 3. Postgraduate Trainee, Department of Obstetrics & Gynaecology, Unit III, Nishtar Medical College & Hospital Multan

## ABSTRACT

**Objective:** To determine the frequency of live birth in patients with unexplained recurrent abortions treated with low molecular weight heparin and aspirin.

**Study Design:** Descriptive study

**Place and Duration of Study:** This study was carried out at Department of Obstetrics & Gynaecology, Unit-III, Nishtar Medical College & Hospital, Multan from 01.01.2014 to 31.12.2014.

**Materials and Methods:** Sixty women with past history of two or more previous unexplained recurrent abortions who received low-molecular weight heparin (LMWH) and low dose aspirin (LDA) were included in the study and followed subsequently for the pregnancy outcome in the form of live birth measure.

**Results:** The age range between 20 to 40 years with mean  $32.38 \pm 3.64$  years. A total of sixty patients were studied with a 58.3% patients were belong to age group of 31-35 years. Previous abortion percentage was 36.7% with 2 abortions while 63.3% with 3 abortions with mean  $2.63 \pm 0.49$  abortions. Live birth was recorded in 51 out of 60 patients with percentage of 85%.

**Conclusion:** An enhancement in the live-birth rate was observed after low-molecular weight heparin (LMWH) and low dose aspirin (LDA) administration, in patient with 2 or more consecutive unexplained recurrent abortions.

**Key Words:** Low-molecular-weight heparin, Low dose aspirin, Recurrent abortions

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## INTRODUCTION

Episodes of repeated abortions are affecting 1-5% of women of child bearing age and the cause of 68% of recurrent miscarriages are yet to be determined.<sup>1</sup> Without proper treatment, only small percentage of pregnancies results in live births.<sup>2</sup> Only few of such cases have identifiable cause either in the mother or fetus, but in most cases of recurrent abortions the cause remains obscure.<sup>1</sup> Successful outcome of a pregnancy depends on optimal utero-placental circulation, the hypercoagulable condition related with thrombophilia.<sup>3-5</sup> Concept behind the use of antithrombotic agents in the management of repeated abortions is that thrombophilia is considered as a potential cause of unexplained recurrent miscarriages because these agents may improve uteroplacental circulation by decreasing hypercoagulability associated with thrombophilia.<sup>6-8</sup>

The pregnancy success rate with the use of antithrombotic therapy in women with heritable thrombophilia are not convincing.<sup>9</sup> Because two or more successive pregnancy losses are quite familiar and cause psychological trauma, and significant proportion of these patients have no identifiable cause moreover, there are no other effective management options. So, antithrombotic therapy is often given for these women, who have unexplained recurrent abortions with the hope to improve pregnancy outcome. Low-Molecular weight heparin (LMWH) and low dose aspirin (LDA) are generally considered safe for management of this condition.<sup>10</sup>

Low molecular weight heparin (Enoxaparin) has been found to have its beneficial effect on enhancing trophoblast implantation.<sup>11</sup> So it needs to be given at the time of implantation.<sup>12</sup> LMWH produce its antithrombotic effect by its blocking action on factor Xa.<sup>13</sup> It does not cross the blood placental barrier and has got no harmful effects on fetus.<sup>14</sup>

Aspirin is also increasingly used to reduce the risk of abortions and improve pregnancy outcome. Low dose aspirin, used as an antiplatelet agent, which is safe throughout pregnancy.<sup>15</sup> An important factor controlling tissue perfusion is the equilibrium between

**Correspondence:** Dr. Shahid Irshad Rao,  
Associate Professor, Department of Obstetrics &  
Gynaecology, Unit III Nishtar Medical College/Hospital  
Multan  
Cell No.: 03008732882  
E-mail: drshahidrao@hotmail.com

thromboxane A2 and prostacyclin.<sup>16</sup> The daily administration of LDA induces a shift in the balance away from thromboxane A2 and towards prostacyclin, resulting into the vasodilatation and enhanced blood flow.<sup>17</sup> Results of recent studies are encouraging which have shown that low molecular weight heparin in combination with low dose aspirin have been found to be the most effective treatment for women of reproductive age with unexplained repeated abortions.<sup>18,19,20</sup>

## MATERIALS AND METHODS

This descriptive case series study was conducted in Nishtar Hospital Multan, Gyane Unit III. Sixty women with a history of two or more consecutive unexplained recurrent abortions at any gestational age before 34 weeks were included in study. Patients with a history of thromboembolism, systemic lupus erythematosus, uterine abnormalities, and multiple successful pregnancies were excluded from study. The women captivated low-dose aspirin (75 mg daily) quickly as they had a positive result on a pregnancy test and low molecular weight heparin (enoxaparin) 40 mg subcutaneous daily at start of fetal cardiac activity observed by ultrasound at 6<sup>th</sup> weeks of gestation; aspirin was discontinued at 36 weeks' gestation, and heparin at 24 hours before delivery. Follow-up of the patients was done through OPD and the antenatal care clinic and all participants received routine iron and folic acid supplements. Participants were closely monitored until delivery. The outcome of all pregnancies in terms of live birth was recorded. The data was analysed using SPSS. Frequency and percentage was computed for live birth. Mean±SD was presented for quantitative variables like age and number of previous abortions. Chi-square test was performed on categorical variables. A p value of <0.05 was accepted as statistically significant.

## RESULTS

The age range between 20 to 40 years with mean 32.38±3.64 years was noted. 58.3% patients were belonged to age group of 31-35 years (Table 1). Previous abortion percentage was 36.7% with 2 abortions while 63.3% with 3 abortions with Mean±SD of 2.63±0.49 abortions as shown in (Table 2).

**Table No.1: Percentage of patients according to age**

Age (years)	No.	%
20-25	4	6.7
26-30	16	26.7
31-35	35	58.3
36-40	5	8.3

Live birth was recorded in 51 out of 60 patients with percentage of 85% as shown in (Table 3) Association of age groups with live birth is shown in Table 4 with p

value of 0.502. Association of no. of previous abortions with live birth is shown in Table 5 with p value of 0.599.

**Table No.2: Percentage of patients according to number of previous miscarriages**

No. of Previous Miscarriages	No.	%
2	22	36.7
>3	38	63.3

**Table No.3: Percentage of patients with outcome (live birth)**

Live Birth	No.	%
Yes	51	85.0
No	9	15.0

**Table No.4: Association of age groups with live birth**

Age (years)	Live birth	
	Yes	No
20-25	4 (100%)	-
26-30	14 (87.5%)	2 (12.5%)
31-35	23 (80%)	7 (20%)
36-40	5 (100%)	-
Total	51 (85%)	9 (15%)

p-value=0.502

**Table No.5: Association of number of previous miscarriages with live birth**

No. of miscarriage	Live birth	
	Yes	No
2	18(81.8%)	4(18.2%)
≥3	33(86.8%)	5(13.2%)
Total	51 (85%)	9 (15%)

p-value=0.599

## DISCUSSION

Treatment with a combination of LDA and LMWH leads to improvement in outcome of pregnancies in terms of a significantly increasing the rate of live births in pregnant women with a history of unexplained recurrent miscarriages. Our findings are comparable with other studies in literature.<sup>21,22</sup> Another recent study also concluded that the use of LMWH is a safe and reliable treatment resulting in a high live birth rate.<sup>23</sup>

However, other measures in our study, such as strict adherence to a follow-up policy for all these patients, might have improved our results because of timely diagnoses and management of antenatal problems.<sup>24</sup> The results of the present study are also similar with a study by Brenner *et al*<sup>25</sup>, that used aspirin 75 mg daily and Inj. Enoxaparin 40–80 mg subcutaneously once daily. The study included patients of recurrent pregnancy loss, live birth rate achieved was 86%. In another study conducted at department of obstetrics and gynaecology, University of Sheffield, England. Enoxaparin was used in subcutaneously dose with 80% live birth rate.<sup>26</sup>

More over Degiannidis *et al* found that low-molecular-



weight heparin and low-dose aspirin daily during pregnancy appear to have a favorable effect on pregnancy outcome in shape of live birth.<sup>27</sup>

LDA and LMWH in combination improve pregnancy outcome by irreversibly blocking the action of cyclooxygenase in platelets, therefore inhibiting platelet thromboxane synthesis and preventing thrombosis of the placental vasculature and promoting successful implantation in early pregnancy respectively.<sup>28,29</sup>

## CONCLUSION

Low-molecular weight heparin (LMWH) and low dose aspirin (LDA) resulted in a improved live-birth rate in patient with 2 or more consecutive unexplained recurrent abortions.

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

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# Ginseng Conduces Degeneration of Differentiating Tissues in Developing Albino Mice

1. Uzma Naseer 2. Sarah Khalid

1. Assoc. Prof. of Pathology, CMH LMDC, Lahore 2. Assoc. Prof. of Anatomy, SMC, Lahore

## ABSTRACT

**Objective:** The current study was conducted to evaluate its effects on developing skin, heart and intestines, derivatives of ectoderm, mesoderm and endoderm respectively, when given during pregnancy to albino mice.

**Study Design:** Experimental Randomized controlled trial study.

**Place and Duration of Study:** This study was conducted at Anatomy Department, University of Health Sciences, Lahore from Jan 2011 to July 2011.

**Materials and Methods:** Twelve pregnant albino mice were divided into two groups of 6 each; group A was given distilled water, Human therapeutic dose (HTD) (780mg/kg/day) was dissolved in 0.1ml of distilled water and was administered to the animals of group B for entire length of pregnancy. Fetuses were delivered and dissected on 18<sup>th</sup> day of gestation. Tissue samples comprising, skin, heart and small intestine derivatives of ectoderm, mesoderm and endoderm respectively, were removed and processed for light microscopic study.

**Results:** In the current study, the difference between dead and alive fetuses, when compared between groups was found to be statistically significant ( $p$  value  $< 0.05$ ). In addition, the histological examination of the above tissues revealed extensive cell death resulting into loss of normal architecture of skin, heart and small intestine. Cells showed pyknotic nuclei and scanty cytoplasm, indicating process of apoptosis, which when compared between groups was found to be statistically significant ( $p < 0.05$ ).

**Conclusion:** It is suggested, therefore, that further investigations and monitoring of additional tissues for the effects of Ginsenosides during pregnancy are warranted.

**Key Words:** Ginseng, Fetus, Apoptosis, Differentiation

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## INTRODUCTION

Herbal medicines are generally believed to be far better than the medicines prepared conventionally; those derived from ginseng are commonly used during pregnancy also and is being evaluated from the point of view of its safety. Extensive research is being conducted in the field of herbal medicines from the point of view of their safety and toxicity<sup>1,2</sup>; it contains the maximum number of active constituents which have extensive pharmacological effects, based on specific mechanism of actions<sup>3</sup>. The Ginseng root resembles human body, the plant is conventionally considered to be panacea for all ailments of the body<sup>4</sup>.

Nearly 10% of women in Asian countries had been using ginseng during pregnancy and on the premise that it is helpful for maintaining healthy mother and developing being<sup>5</sup>.

Triterpene saponins are active ingredients of Ginseng under the name of ginsenosides<sup>2</sup>; six different types had been identified as (Rb1, Re, Rc, Rd, Rb2 and Rg1) <sup>6</sup>. By initiating different mechanisms concomitantly and produce different effects in the same tissue which is due

to diversity in their structure; an overall complex picture of result is thereby created<sup>7</sup>. This is stipulated to be operated through the hypothalamus-pituitary-adrenal axis and through stimulated through immune system<sup>8</sup>. Numerous beneficial effects of Ginseng had been reported; little information is available however, about its toxic adverse effects and much less is available about its teratogenicity<sup>9</sup>. Various in vitro studies had indicated that Ginsenoside exerted direct toxic effects on the development of rat embryos<sup>10, 11</sup>. It is postulated that un-conjugated steroid hormones cross the placental barrier rather freely<sup>12</sup>, and active endocrine like substance in ginseng may be responsible for its effect on neonatal development.<sup>9</sup>

A case report was found in the literature that reported a potential link between Panax ginseng used by a pregnant woman and the death and androgenization of her fetus<sup>13</sup>.

There is a gap in the basic clinical information as to the indications for use and the safety of herbs used by women during pregnancy. On this basis, we have tried to see the histological effects of administration of Ginseng to pregnant dams on developing tissues of fetuses to substantiate the earlier observations. Further studies are warranted to evaluate the embryotoxic effects of ginsenosides.

**Correspondence:** Uzma Naseer,  
Assoc. Prof. of Pathology, CMH LMDC, Lahore  
Cell No.: 0300-4971324  
E-mail: uzma.akhtar64@gmail.com

## MATERIALS AND METHODS

Sixteen albino mice (twelve female and four males) 6-8 weeks of age were obtained from the National Institute of Health, Islamabad; The animals were maintained in the animal house of University of Health Sciences, Lahore; the temperature of the environment was controlled at  $22 \pm 0.5^\circ\text{C}$  and humidity was set at  $50 \pm 10\%$ . Light and dark periods were for 12 hours each. Breeding was accomplished by placing one male with three females overnight for 12 hours. Gestational day 0 (zero) was confirmed upon seeing the vaginal plug.<sup>3</sup>. Experimental animals were randomly divided into three groups; each containing, six female and two male mice. Sigma was source for obtaining Panax Ginseng root powder containing 3 % Ginsenosides.

### Grouping

**Group A:** Animals were given 0.1ml distilled water for the entire period of pregnancy.

**Group B:** Distil water, 0.1 ml was used as a solvent for HTD (780mg/kg/day) for the complete duration of pregnancy

**Microscopic Examination:** The pregnant mice were killed on the 18<sup>th</sup> day of pregnancy and the fetuses were taken out. The fetuses were dissected to remove the tissues pieces from skin, heart and small intestine for histological preparation. The tissues were fixed in 10% formalin for 48 hours. They were processed, embedded in paraffin wax and stained with haematoxylin and eosin for light microscopic examination.

**Statistical analysis:** The statistical analysis was done using computer IBM SPSS Statistics version 22. Data were present in frequency and percentage. The significance between two groups was calculated Chi-square test and Fisher's exact test. The difference was regarded statistically significant if the 'p' value was < 0.05.

## RESULTS

**Litter size:** The total available litter size was 97, of which 52 belonged to group A and 45 were from group B. In the latter group 12 fetuses were dead and the difference between the alive fetuses of the two groups was statistically significant ( $p < 0.05$ ).

**Histological Features:** Histological examination of skin, heart and small intestine from the treated group revealed focal degeneration; loss of tissue architecture and apoptosis. The difference between tissue degeneration in the treated group when compared to the control group was statistically significant ( $p < 0.05$ ) (Table 2).

**Skin:** Histological examination of fetal skin from the control group revealed a well organized epidermis with distinct layers of closely packed cells. It was

characterized with prominent stratum basal and corneum Fig1.(I).

The histological sections of skin from group B, focal areas of degeneration in epidermis were observed along with the rudimentary buds of hair follicles in the dermis Fig. 1. (II).

**Heart:** On histological examination, the longitudinal section of heart from the control group showed well organized myocardial architecture. Cardiac muscle fibers show regular branching pattern with well formed oval and central nuclei Fig. 2. (I).

The myocardium in group B showed myofibrillar disarray, multifocal apoptosis in various stages; the nuclei were pyknotic and cytoplasm was scanty Fig. 2. (II).

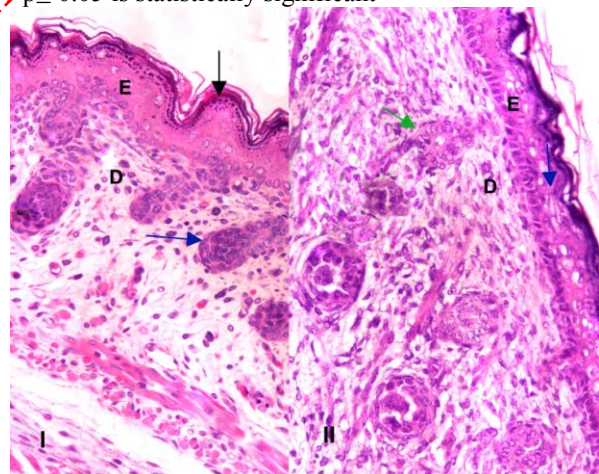
**Small Intestine:** Histological examination of small intestine from the control group showed closely packed villi covered with simple columnar epithelium overlying well developed lamina propria and muscularis externa Fig. 3. (I).

In group B, the villi lacked normal histological architecture due to disrupted epithelium, submucosa and muscularis externa Fig. 3. (II).

**Table No.1: Comparison between litter size from groups A & B.**

Parameter	Control Group (n=52) n (%)	Treated Group (n=45) n (%)	p-value
Dead fetuses n (%)	0 (0%)	12 (26.7%)	<0.001*

\* $p \leq 0.05$  is statistically significant



**Fig.1. (I);** Photomicrograph of fetal skin from control group showing well defined epidermis (E) with prominent stratum basal and stratum corneum (black arrow). Dermis (D) shows numerous hair follicles (blue arrow) at different stages of differentiation. H and E stain X 200.

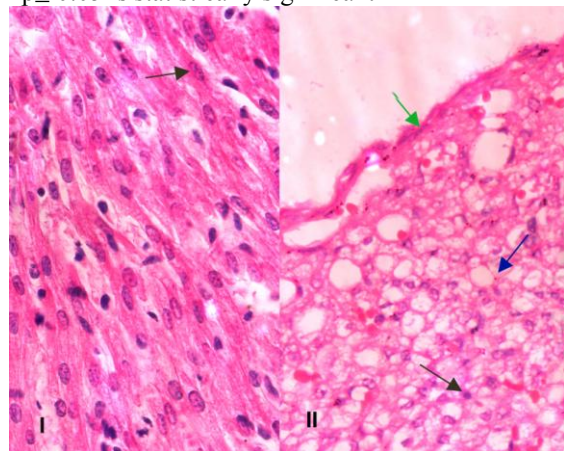
**(II);** Photomicrograph of fetal skin from treated group shows significant epidermis (E) with large intercellular spaces (blue arrow). Dermis (D) shows hair follicles comprising a few premature buds (green arrow). H and E stain X 200.



**Table No.2: Comparison of occurrence of apoptosis in skin, heart and small intestine from groups A & B.**

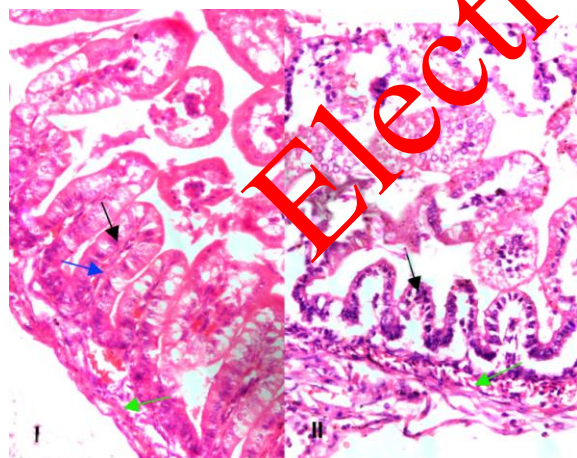
Tissues	Group A(52) n (%)	Group B(45) n (%)	p-value
Skin	0 (0%)	10 (22.2%)	< 0.001
Heart	0 (0%)	15 (33.3%)	< 0.001
Small intestine	0 (0%)	18 (39.1%)	< 0.001

\*p≤ 0.05 is statistically significant



**Figure No. 2. (I); Photomicrograph of fetal heart from group A: myocardial cells show regular branching pattern and have centrally located nucleus (black arrow). H and E stain X 400.**

**(II); Photomicrograph of fetal heart from group B: showing epicardium lined by simple squamous epithelium (green arrow), cardiac muscle cells with pyknotic (black arrow), scanty cytoplasm (blue arrow). branching pattern is not discernible. H and E stain X 400.**



**Figure No. 3: (I); Photomicrograph of fetal small intestine from group A: showing villi covered with columnar epithelium (black arrow), a core of lamina propria (blue arrow) surrounded by a layer of muscularis externa (green arrow). H and E stain X 200.**

**(II); Photomicrograph of fetal small intestine from group B: showing degenerative changes; surface epithelium was damaged (black arrow), crypts were disorganized, lamina propria and muscularis externa (green arrow) were also disrupted. H and E stain X 200.**

## DISCUSSION

The World Health Organization estimates that 65 - 80% of the world's population uses traditional medicine as their main health care system. Alternative therapies are becoming important in the health profession nowadays and therefore, these are being extensively investigated for their safety and efficacy<sup>12</sup>.

Ginsenosides have been shown to have a variety of beneficial effects including anti-inflammatory, and anticancer effects<sup>2</sup>. Ginseng has been reported to have wide variety of biological activities including immunomodulatory effects, anti-inflammatory, antioxidant and antitumour activity<sup>2,6</sup>.

In the present study, we investigated the effects of ginseng on histological structure of fetal tissues involving skin, heart and small intestine, derivatives of three germ layers ectoderm, mesoderm and endoderm respectively. Ginseng at Human therapeutic dose (HTD) 780mg/kg/day, resulted in high mortality rate on account of extensive tissue damage done by it; the difference of alive and dead fetuses was found to be significant between groups A and B. Our findings were consistent with another study in which ginsenoside Rg1 at different concentrations during period of organogenesis was found to be embryotoxic in both rats and mouse; the heart was among affected organs<sup>14</sup>.

Evident in the sections of the skin, heart and small intestine were loci of degeneration and apoptosis; these loci were statistically significant in treated group as compared with the control group. Histological examination revealed loss of normal tissue architecture; pyknotic nuclei, and disruption of cell membranes indicating process of degeneration going in the tissues as a result of Ginsenosides. These findings are supported by earlier studies in which Ginseng was reported to possess cytotoxic activity; the basis for its anticancer activity<sup>15</sup>. Ginseng probably arrests the growth of progenitor cells resulting in increased foci of degeneration and apoptosis.

Many Ginsenosides are reported to possess toxic and growth inhibitory effects on cell against tumor cells, while others had been shown to induce differentiation and inhibit metastasis<sup>1</sup>. Rh2 Ginsenoside had shown to inhibit growth and stop cell division at the G1 stage<sup>16</sup>. Cell death induced by ginsenoside Rh2 is mediated in part by the caspase-dependent apoptosis and in part by caspase-independent paraptosis, a type of cell death that is characterized by accumulation of cytoplasmic vacuoles<sup>17</sup>. Structural similarities of Ginsenosides with steroids conduce them to traverse across cell membranes freely, and produce cytotoxicity. It has been stated that steroid hormones bind with nuclear receptors and are said to affect primarily the mRNA transcription leading to protein synthesis and causing cell death<sup>18</sup>.

Any toxic insult during development to proliferating and differentiating cells shall lead to their death and

degeneration; Compound K is a Ginseng metabolite formed by intestinal bacteria after oral administration of Ginseng extract in humans and rats<sup>19</sup>. It has been speculated that intestine absorb compound K, the major protopanaxadiol saponin which readily penetrates the mitochondria and causes activation of caspase 9<sup>17</sup>. Caspase are a family of proteins, activated in the initial phases of apoptosis and breakdown or cleave key cellular substrates which are needed for normal cellular function. They also maintain structural proteins in the cytoskeleton and nuclear proteins such as DNA repair enzymes. The caspases also promote other enzymes such as DNase, which are responsible for the cleavage of DNA in the nucleus<sup>20</sup>.

## CONCLUSION

Our study has demonstrated that Ginsenosides present in the commercially available Ginseng products exert direct on mouse embryos. Until more is known about the effects of Ginsenosides in women of reproductive age, we suggest that Ginseng may be sparingly used for various diseases during pregnancy.

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

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# Hyperlipidemia, Hypercholesterolemia and Glycemic Control as Risk Factor for Diabetic Retinopathy

1. Rajesh Rathi 2. Iqbal Ahmed Memon 3. Afsheen Kazi

1. Asstt. Prof. of Ophthalmology, MMC, Mirpurkhas, Sindh 2. Asstt. Prof. of Medicine, LUH, Jamshoro, Sindh

3. Asstt. Prof. of Pathology, IMC, Tando Muhammad Khan, Sindh

## ABSTRACT

**Objective:** To investigate the blood lipids, serum cholesterol and glycaemic control as risk factor for Diabetic retinopathy (DR).

**Study Design:** Cross sectional study

**Place and Duration of Study:** This study was conducted at Muhammad Medical College Hospital Mirpurkhas and Consultant Clinics Hyderabad from March 2014 to January 2015.

**Materials and Methods:** 100 cases of DR were selected for present study. Fundoscopy was performed by the physician followed by a Consultant ophthalmologist. Blood was collected from peripheral vein after a fasting state of 8 – 12 hours. Glycated hemoglobin A1 (A1C) and lipids were evaluated by standard assays. Volunteers were requested to sign to informed consent proforma. Research topic was approved by ethics committee of institute. Statistix 8.1 for data analysis and P-value  $\leq 0.05$  was considered significant.

**Results:** Of 100 patients, 58 (58%) were male and 42 (42%) were female patients. Mean  $\pm$  SD age in patients with and without DR was  $49.5 \pm 8.5$  and  $46.3 \pm 5.1$  years respectively. 21% frequency was noted for DR of any type. Age, male, A1C, hypercholesterolemia, hyperlipidemia and microalbuminuria proved positive correlated with DR. Correlation of DR was not found with VLDL, HDLc and triacylglycerols.

**Conclusion:** The present study reports hyperlipidemia, hypercholesterolemia and poor glycaemic control as risk factors for diabetic retinopathy.

**Key Words:** Diabetes Retinopathy, Hypercholesterolemia, Hyperlipidemia, HbA1c

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## INTRODUCTION

Worldwide, the diabetes mellitus (DM) is approaching epidemic proportions and becoming a major public health challenge. In the millennium year, the DM burden was approximately 171 millions, which was reported to be 11% higher than previous reports.<sup>1</sup> Current estimates shows 8 million of diabetics in Pakistan and a same burden of those suffering from the impaired glucose tolerance. DM is characterized by microvascular complication, and Diabetic retinopathy (DR) is one of its type.<sup>3</sup> DR runs a natural course of progression from mild, moderate to severe non-proliferative retinopathy (NPR) and proliferative retinopathy (PR). Increased vascular permeability occurs in mild NPR. The microvasculature shows closure in moderate and severe NPDR. Neo-vascularization occurs over retina and behind vitreous humor in severe form of retinopathy called PR. Severe PR shows vascular exudates because of leaky

microvasculature and retinal thickening.<sup>4</sup> Previous studies had reported for screening of DR and its cost effectiveness which is essential for clinical prevention.<sup>5</sup> Type 2 diabetics (T2DM) show a prevalence of 5-35% of DR at the time of clinical diagnosis.<sup>6</sup> DR has become a major cause of blindness the World over.<sup>7</sup> Pakistan scenario shows an alarmingly increased incidence of newly diagnosed DM in various parts of countries. Newly diagnosed DM is reported from rural areas as 5% and 4.8% in male and female respectively; while urban areas show higher frequency of 5.1% and 6.8% in male and female respectively.<sup>8</sup> Unfortunately, national data on the prevalence of DR is lacking in particular in the newly diagnosed DM subjects.

Several risk factors had been pointed out in the development of DR in DM such as increased body mass index (BMI), reduced BMI, poor glycaemic control, hypercholesterolemia, hyperlipidemia and raised fasting glucose,<sup>9,10</sup> but have never been searched. Because of the high prevalence of type 2 DM in Sindh, it is worth to search the issue to make national baseline data regarding risk factors of DR among newly diagnosed patients. The present study analyzed the risk factors and frequency of Diabetic retinopathy among type 2 diabetics.

**Correspondence:** Dr. Iqbal Ahmed Memon,  
Asstt. Prof. of Medicine, LUH, Jamshoro, Sindh  
**Cell No.:** 0300-3019584  
**E-mail:** dri.memon@yahoo.com



## MATERIALS AND METHODS

The present study of cross sectional design was conducted at Muhammad Medical College Hospital Mirpurkhas and Consultant Clinics - Hyderabad over duration of March 2014 - January 2015. The patients were selected through non-probability purposive sampling. The criteria for diagnosis of type 2 DM were according to WHO guidelines 1994. A sample of 100 subjects was selected through non-probability purposive sampling as per pre-defined inclusion and exclusion criteria. Volunteer diagnosed type 2 diabetics with retinopathy of age 20-50 years were included. Diabetics with chronic liver disease, renal failure and other major systemic illness were excluded. Data were collected and noted in a structured proforma. Written informed consent was signed by volunteer subjects. A consultant ophthalmologist was asked to perform Fundoscopy once physician has completed his interest. Anterior eye ball segment was examined using slit lamp and measured; the intraocular pressure (applanation tonometer) was measured and fundoscopy.<sup>10</sup>

In this study, it was not possible to assess retinal thickening/elevation as a consequence of non availability of stereo retinal micro-photographs. Therefore, maculopathy *per se* was not gradable. Mild retinopathy cases managed, while moderate - severe retinopathy and proliferative or photocoagulated cases were referred to an ophthalmology service. The patients were assessed for the presence of risk factors: sex, age, duration, systolic & diastolic blood pressure, hyperglycemia, nephropathy, hypertension, cholesterol, triglycerides, smoking and obesity. Joint National Committee (JNC) VIII criteria were followed for diagnosis of hypertension.<sup>3</sup>

Patients were instructed for 12 hour fasting for determination of blood lipids according to WHO criteria<sup>7</sup>. The BMI was calculated by formula weight/height. A BMI of 25-29.9 kg/m<sup>2</sup> was regarded as overweight and  $\geq 30$  kg/m<sup>2</sup> as obesity<sup>10</sup>. The patients were divided into 2- groups: a). group I. those with any DR and; b). group II. those without DR. The degree of glycaemic control was evaluated by measuring HbA1c concentration. Ideal glycaemic control was considered an A1C of < 7%. Microalbuminuria was measured in early morning urine first void sample after exclusion of other causes. Blood lipids criteria were counted as per standards of ATP III; total cholesterol >200mg/dL, LDLc >130mg/dL, HDL <40mg/dL, VLDL >30mg/dL, and triglycerides >150mg/dL.<sup>11</sup> Data was analyzed on *Statistix 8.1* (USA). Normality of data was checked by Shapiro Wilk testing. Continuous and categorical variables were analyzed (student's t test & chi square test). Significant p-value was taken at  $\leq 0.05$ .

## RESULTS

Of 100 patients, 58 (58%) were male and 42 (42%) were female patients. Mean  $\pm$  SD age in DR was 49.5 $\pm$ 8.5 versus 46.3 $\pm$ 5.1 years without DR. Any type of retinopathy was noted in 21 (21%). Prevalence of mild retinopathy was 12% and moderate-severe retinopathy was 18%.

**Table No.I. Baseline characteristics of diabetic study population (n=100)**

	Retinopathy		p-value
	Yes (n=21)	No (n=79)	
Age (years)	49.5 $\pm$ 8.5	46.3 $\pm$ 5.1	0.03
Male	15	43	0.09
Female	06	36	0.13
BMI (kg/m <sup>2</sup> )	26.5 $\pm$ 7.8	27.7 $\pm$ 9.5	0.043
BMI	19	35	0.03
SBP (mmHg)	152 $\pm$ 11	136 $\pm$ 11	0.03
DBP (mmHg)	91 $\pm$ 11	76 $\pm$ 9	0.61
Smoking (5 packs year)	4	29	0.03
Obesity (BMI >30kg/m <sup>2</sup> )	17	39	0.12
Blood glucose (mg/dl)	279 $\pm$ 23.5	241 $\pm$ 13.7	0.012
Serum creatinine(mg/dl)	3.1 $\pm$ 0.51	2.1 $\pm$ 0.11	0.12
HbA1c ( $\geq$ 7%)	19	35	0.013
Microalbuminuria	17	06	0.023

**Table No.2: Lipid profile in diabetic study subjects (n=100)**

	Retinopathy		p-value
	Yes (n=21)	No (n=79)	
Triglycerides (mg/dl)	231.1 $\pm$ 110.7	132.9 $\pm$ 45.7	0.001
Cholesterol- Total (mg/dl)	211.1 $\pm$ 44.9	158.3 $\pm$ 25.9	0.0001
HDLc (mg/dl)	32.5 $\pm$ 7.3	39.9 $\pm$ 8.5	0.02
LDLc (mg/dl)	126.6 $\pm$ 17.3	96.3 $\pm$ 19.6	0.001
VLDL (mg/dl)	29.3 $\pm$ 8.1	41 $\pm$ 14	0.00

There were 6 cases of proliferative or photocoagulated retinopathy (6%). The frequency of risk factors in patients with & without retinopathy is shown in table I. DR was found increased with aging (Table II). Any type of DR showed +ve correlation with age, male gender, HbA1c, microalbuminuria and LDLc (table III). HDLc, triglycerides and VLDL showed -ve correlation with DR.



**Table No.3: Correlation of risk factors with Diabetic retinopathy (n=100)**

	<b>r-value</b>	<b>p-value</b>
Age	+0.47	0.001
Gender- male	+0.45	0.001
Smoking	+0.61	0.001
HbA1c (%)	+0.87	0.001
Microalbuminuria (mg/L)	+0.83	0.001
Cholesterol (mg/dl)	+0.89	0.031
LDLc (mg/dl)	+0.52	0.032
Triglycerides (mg/dl)	-0.39	0.0001
HDLc (mg/dl)	-0.57	0.001
VLDL (mg/dl)	-0.27	0.001

## DISCUSSION

Frequency of DR was noted as 21% in present study. A previous study reported a prevalence of 15.7%<sup>11</sup> which is less to present finding, while another study had reported a prevalence of 15% of DR.<sup>12</sup> The high prevalence of present study is most probably because of long duration of DM of our study subjects as shown in table I. Our findings of age, smoking, blood sugar, HbA1c, cholesterol, triglycerides, LDL, HDLc, VLDL, BMI, and serum creatinine are consistent with previous study.<sup>12</sup>

Another previous study has reported similar results of the older age, insulin therapy, HbA1c, hypercholesterolemia, triglycerides, microalbuminuria and duration of diabetes significantly related to the DR.<sup>10</sup> Findings of above study are consistent with our present study. Previous studies by Talu et al<sup>13</sup> and Tzeng TF et al<sup>14</sup> had reported DR prevalence of 14.37% and 25.5% respectively. The findings are comparable to present study. However, another previous study<sup>15</sup> has reported a prevalence of 59.3% of DR which is very high. Several studies had reported differing prevalence of DR, and this might be because of various factors such as: different study populations, race, ethnicity, age, study designs, primary and secondary health care facilities, and other risk factors.

Some studies have shown that older age at diagnosis of DM is a risk factor for DR, this is most probable differences of reported frequency of DR<sup>13-15</sup>. Male gender is proved as risk factor for DR which is similar to a previous report by Liu et al.<sup>16</sup> A1c level is an established gold measure of diabetic glycemic control. It was reported that a 1% reduction reduces diabetic microvascular complications by 25%. Systemic hypertension and micro-albuminuria proved of having a +ve correlation with DR in present study, the findings support the previous work.<sup>6,10,13,14</sup> Smoking proved risk factor for DR which is consistent to reported studies.<sup>10,17</sup> Hyperlipidemia, hypercholesterolemia and poor glycaemic control were proved as risk factors for DR. The principal limitation of present study is the small sample size; however, the findings are of clinical

importance. Further studies with large sample size are recommended to quantify the prevalence of and to identify the risk factors of DR in our population.

## CONCLUSION

The present study reports hyperlipidemia, hypercholesterolemia and poor glycaemic control as risk factors for diabetic retinopathy. Treating physicians and ophthalmologist must consider of the risk factors. It is essential to perform ophthalmological examination and treat risk factors to prevent retinopathy and blindness.

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

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# Pattern of Breast Diseases at Bahawal Victoria Hospital, Bahawalpur, Pakistan

1. Raees Abbas Lail 2. Abdul Rahim Grewal 3. Niaz Muhammad

1. Asstt. Prof. of Pathology, Sahiwal Medical College, Sahiwal 2. Consultant Surgeon, DHQ Teaching Hospital, Sahiwal 3. Consultant Physician, DHQ Hospital, Pakpattan

## ABSTRACT

**Objective:** This study was carried out to know the frequency and magnitude of different breast diseases including all the benign, malignant and inflammatory lesions in the local population of Bahawalpur in south Punjab, Pakistan.

**Study Design:** Descriptive cross-sectional study design.

**Place and Duration of Study:** This study was conducted at the Department of Pathology, Quaid-e-Azam Medical College/Bahawal Victoria Hospital, Bahawalpur, Pakistan from January 2004 to December 2006.

**Materials and Methods:** A retrospective data analysis of breast biopsies and mastectomies based upon histopathology.

**Results:** Histopathological analysis revealed that out 166 cases, 50% were benign, 37.34 % were malignant and 12.65 % were inflammatory lesions; mean age of diagnosis was 33.2, 49 and 31.15 years for these lesions respectively. Of all the breast lesions, fibroadenoma was the most common 39.15 % (65 patients), followed by invasive ductal carcinoma 33.73 % (56 patients). Non proliferative breast change (Fibrocystic changes 4.81 % and adenosis 3.01%) ranked third with 13 patients, while chronic mastitis and breast abscess were the fourth (5.42 %) and fifth (3.61%) common diagnoses respectively. Mean age of diagnosis for fibroadenoma and invasive ductal carcinoma was 21 and 48 years respectively.

**Conclusion:** Fibroadenoma was the most common histopathological diagnosis while invasive ductal carcinoma was the most common malignancy of breast as well as the second most common diagnosis. Mean age of diagnosis for breast carcinoma was 49 years.

**Key Words:** Breast cancer, Fibroadenoma, Fibrocystic changes, Mastitis, Bahawalpur

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## INTRODUCTION

In recent times increasing awareness regarding breast diseases amongst women, improved diagnostic facilities and availability of better treatment options has led patients to seek medical advice. It is thus of increased interest and curiosity to know about the pattern of breast diseases that females in our population harbor. Most of the studies in Pakistan have been published on breast malignancies. This study was carried out to know the frequency and magnitude of different breast diseases including all the benign, malignant and inflammatory lesions in the local population of Bahawalpur in south Punjab, Pakistan. We believe that this study will be helpful in providing data for developing resources and planning the control and prevention of different breast diseases especially breast cancer in the underdeveloped region of Bahawalpur.

Breast cancer is the most common malignancy in women in developing countries as well as in Pakistan and is the primary cause of death from cancer in women.<sup>1, 2</sup> It is estimated that 1 million women are

diagnosed with breast cancer each year and more than 0.4 million will die because of it.<sup>3,4</sup> It is an important cause of disease and fatality amongst women.<sup>5</sup> Despite these alarming statistics, most of the females suffer from benign breast diseases as only 10 % of women with a lump under the age of 40 suffer from malignancy and 40 % of the lumps in women aged more than 50 are benign.<sup>6</sup>

## MATERIALS AND METHODS

It is a Descriptive, cross-sectional study design. A retrospective data analysis of breast biopsies and mastectomies based upon histopathology. The study was conducted from January 2004 to December 2006 at the Department of Pathology, Quaid-e-Azam Medical College/Bahawal Victoria Hospital, Bahawalpur, Pakistan.

Data of all the biopsy proven benign diseases and malignancies of breast was retrieved from the record of Pathology Department. The epidemiological data was sorted and scrutinized for age, sex and the histological diagnosis. The Haematoxylin and eosin stained slides of malignancies were reviewed for confirmation of diagnosis. All the lesions were sub classified into inflammatory, benign or malignant subtype. Males were excluded from the study.

**Correspondence:** Dr. Raees Abbas Lail

Assistant Professor of Pathology,  
Sahiwal Medical College, Sahiwal

Cell No.: 0300-7834400

E-mail: raeesabbas@gmail.com

## RESULTS

Histopathological analysis revealed that out 166 cases, 83 (50%) were benign, 62 (37.34 %) were malignant and 21 (12.65 %) were inflammatory lesions. Mean age of diagnosis was 31.75, 33.2 and 49 years for inflammatory, benign and malignant lesions respectively. Of all the breast lesions fibroadenoma was the most common as 39.15 % i.e. 65 patients suffered from it. It was followed by invasive ductal carcinoma 33.73 % (56 patients). A detail of distribution of benign breast diseases is given in Table 1. Mean age for invasive ductal carcinoma was 48 years. Non proliferative breast changes (fibrocystic changes 4.81 % and adenosis 3.01%) ranked third and accounted for 7.83 % of disease i.e. 13 patients suffered from it. Chronic mastitis and breast abscess were the fourth and fifth common diagnoses respectively. Nine patients (5.42%) had chronic mastitis and six (3.61 %) had breast abscess.

**Table No.1. Distribution of benign breast lesions**

Type of lesion	Number of Patients (n)	Percentage (%)	Mean Age (Years)
Fibroadenoma	65	39.15	21
Fibrocystic changes	08	4.81	41
Adenosis	05	3.01	38
Sclerosing adenosis	03	1.80	40
Lactating adenoma	02	1.20	25
Total Inflammatory lesions= 83 (50 %)			
Mean Age= 33.2			

**Table No.2: Distribution of inflammatory breast lesions**

Type of lesion	Number of Patients (n)	Percentage (%)	Mean Age (Years)
Chronic Mastitis	09	5.42	31
Breast abscess	06	3.61	23
Mammary duct ectasia	04	2.40	39
Granulomatous mastitis	02	1.20	34
Total Inflammatory lesions= 21 (12.65%)			
Mean Age= 31.75			

Proliferative breast disease without atypia (sclerosing adenosis) and lactating adenoma were infrequent diagnoses in benign category accounting for 1.8 and 1.2% of breast diseases respectively. Whereas in inflammatory category, mammary duct ectasia and granulomatous mastitis accounted for 2.4 and 1.2 % of

the burden of total breast disease. Detail of distribution of inflammatory breast diseases is given in Table 2.

Asides invasive ductal carcinoma not otherwise specified, invasive lobular carcinoma, ductal carcinoma in situ and mucinous carcinoma were diagnosed in 3 (1.8%), 2 (1.2 %) and 1 (0.6%) patient(s) respectively. Mean age for individual cancer is given in Table 3.

**Table No.3: Distribution of malignant breast lesions**

Type of lesion	Number of Patients (n)	Percentage (%)	Mean Age (Years)
Invasive ductal carcinoma	56	33.73	48
Invasive lobular carcinoma	03	1.80	52
Ductal carcinoma in situ	02	1.20	47
Mucinous carcinoma	01	0.60	49
Total Inflammatory lesions= 62(37.34 %)			
Mean Age= 49			

## DISCUSSION

Given below is the argument for individual benign, malignant and inflammatory lesions. Gynaecomastia is a common condition affecting male breasts that is characterized by benign enlargement.<sup>7</sup> Gynecomastia was the histopathological diagnosis in three male patients but they were excluded from analysis.

**Benign lesions:** Fibroadenoma accounted for 39.15 % of total breast disease in our study. While it was reported to be 16.95 % and 35.17 % in couple of other national studies from Karachi.<sup>8,9</sup> While fibroadenoma constituted 40.5 % of the burden of benign breast disease in Yemen.<sup>10</sup>

Non proliferative breast changes accounted for 7.83 % of the total breast disease burden. Fibrocystic changes were communicated to be 13.96 % and 16.28 % in other studies from the country.<sup>8,9</sup> While fibrocystic changes represented 16 % of benign breast diseases in Yemen and was the commonest benign lesion according to a study in Nigeria.<sup>10,11</sup> Lactating adenoma was present in 1.2 % of cases in our study while it was found to be 0.97 % in Karachi.<sup>9</sup>

**Malignant lesions:** Invasive ductal carcinoma represented 33.73 % of the total breast diseases while it was found to be 21.84 % in Karachi;<sup>9</sup> it is also the most common type histological malignancy reported in literature.<sup>12</sup> Mean age of patients suffering from breast cancer was 49 in our study while it was reported to be 47.7, 48 and 48.3 by other studies in Pakistan.<sup>2, 13, 14, 15</sup>



Pre-dominant morphology was infiltrating ductal carcinoma in our results (90% of cancers); similar findings were reported by different other studies representing it to be 81 %, 85.3 %, 89.9 % and 92 % of breast cancers.<sup>2,14,16,17,18</sup> Age of presentation in Pakistan for breast cancer thus remains younger to western studies.<sup>14, 15</sup>

Invasive lobular carcinoma was 4.83 % of breast cancers in our results while 5.4 % was reported from northern Pakistan.<sup>19</sup> Ductal carcinoma in situ (DCIS) was found to be 3.22% of all cancers while around 1 % and 0.65 % has been reported from Karachi.<sup>9, 20</sup> Our mean age for DCIS was 47 years and 48.95 was reported from Karachi.<sup>20</sup> Mucinous carcinoma represented only 0.6 % of breast diseases while it only depicted 0.32 % of breast diseases cases in a study from Karachi.<sup>9</sup>

**Inflammatory lesions:** Chronic mastitis was found to be 5.42 % in our study while it was shown to be 6.83 % and 7.81 % in Karachi.<sup>8,9</sup> Breast abscess was present in 3.61 % of our cases while it 7.16 % of total breast diseases cases in Karachi.<sup>9</sup> Mammary duct ectasia was found in 2.4 % of the cases in our study but was 5.33 % and 2.9 % in Karachi.<sup>8,9</sup>

Tuberculosis of breast is thought to be an uncommon diagnosis that can be confused with carcinoma of the breast. Granulomatous mastitis was seen at a frequency of 1.2 % of the 166 patients seen with breast diseases with a mean age of 34 years while it was 0.37 % in a study from Shaukat Khanam Memorial Cancer Hospital with mean age of 40.7 years.<sup>21</sup>

## CONCLUSION

Fibroadenoma was the most common histopathological diagnosis while invasive ductal carcinoma was the most common malignancy of breast as well as the second most common diagnosis. Mean age for breast carcinoma was 49 years.

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

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# Peripheral Neuropathy: Incidence and Clinical Presentation in the Cases of Diabetic Mellitus

1. Muhammad Iqal 2. Abdul Munam 3. Adnan Ahmed

1. Assoc. Prof. of Medicine, LUHMS, Jamshoro 2. Assoc. Prof. of Neurology, Isra University Hospital, Hyderabad

3. Asstt. Prof. of Radiology, LUHMS Jamshoro

## ABSTRACT

**Objective:** To assess the incidence and clinical presentation of peripheral neuropathy in the cases of diabetic mellitus

**Study Design:** Cross sectional study

**Place and Duration of Study:** This study was conducted at Medicine Department of LUMHS with the duration of time February 2011 to January 2012.

**Materials and Methods:** Total 200 cases were chosen for this study after diagnosis of diabetic mellitus. All equitable laboratory investigations were carried out, along with HbA1C. All the cases were excluded from the study those were less than 5 HbA1c levels, history of any trauma leading to neurological deficit that can compromise assessment of sensory system along with history of renal failure. All the data regarding demographic characteristics, incidence and clinical pattern of the cases with peripheral neuropathy was entered in the pre designed Performa.

**Results:** Mean age of the cases was  $56.3 \pm 10.21$  years. Mostly cases were noted from urban area 60.0%. 46.0% cases were smoker and mostly smoker were male, while 26(13.0%) patients (totally male) were with history of alcohol consumption. Mostly patients were poor socioeconomically. Incidence of the neuropathy was noted 60% further according to the classification, 16% cases were found with mild neuropathy, 21% were with severe while majority of the cases 32% were found with moderate neuropathy. According to the clinical presentation mostly cases were found with burning, 85.0%, Pain 66.6%, numbness 75.0%, while Sensitive touch, Itching, Foot ulcer, Muscle cramp and Tingling were found as 60(50.0%), 26(30.0%), 18(15.0%), 45(37.5%) and 51(42.5%) respectively.

**Conclusion:** In this study it is concluded that incidence of diabetic peripheral neuropathy is very high, and it increases with the increasing time of diabetes, uncontrolled diabetes and ignorance diabetes. Majority of the cases had found with sensory loss having foot ulcers, and they were unaware regarding this condition.

**Key Words:** Peripheral Neuropathy, Clinical Presentation, Diabetic Mellitus

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## INTRODUCTION

Diabetes mellitus (DM) has come to pandemic extents around the world. Generally, diabetes was viewed as a big problem kept to created nations and rich individuals. Nonetheless, newly gauges propose that incidence of diabetes is increasing all around, especially in creating nations.<sup>1</sup> DM has turned into an critical wellbeing concern in South Asian along with an expected increment in the incidence more than 15.1% somewhere around 2000 and 2030.<sup>1</sup> Neuropathy is viewed as the most widely recognized micro vascular risk for in type I and II DM.<sup>2,3</sup> Neuropathic issue in diabetes can damage function of CNS, PNS and/or ANS.<sup>4</sup> Distal peripheral neuropathy (DPN), called diabetic polyneuropathy influences PNS and is by a

wide margin the most well-known sort of neuropathy found in DM. In results functioning loss of peripheral nerves causes loss of defensive sensations and damage ability of the cases to see early or even obvious feet ulcerations. DPN is viewed as a principle reason of the amputation, and subsequently a huge reason for morbidity in diabetic mellitus.<sup>5</sup>

In spite of the fact that a typical and essential diabetic complication, neuropathy has not been concentrated on as frequently or as widely complication of macro vascular, retinopathy or nephropathy. What's more, the reported predominance estimated broadly between nations, to some degree because of the distinction in testing techniques and absence of accord on criteria of diagnosis.<sup>6</sup> Rising age, longer length of time of diabetes and diabetic poor control are very much perceived danger elements for DPN, while retinopathy, hypertension, weight, hyperlipidaemia, smoking, and microalbuminuria have additionally been ensnared as potential danger markers.<sup>7</sup> Most commonness and danger variable studies are from western created

**Correspondence:** Dr. Muhammad Iqal,  
Assoc. Prof. of Medicine, LUHMS, Jamshoro  
**Cell No.:** 0333-2700190  
**E-mail:** dr.saeedarain786@gmail.com

nations, while a linked data shortage from creating nations, especially from the region of the South-Asian.<sup>8</sup> In any case, an expected 80% of the worldwide populace with diabetes lives in creating nations. Population of the South-Asia specifically is well known with an expanded inclination for the illness. What's more, a few studies have shown that the danger of diabetes related removals and the incidence of ulcer of the diabetic foot UK is fundamentally lower in cases of the diabetes of Asian inception when contrasted with that of diabetic cases of European root.<sup>9,10</sup> This diminished risk in Asians was observed to be identified with the lower occurrence of peripheral artery and DPN. Ethnic contrasts and differential ecological presentation to hazard components in the various nations are extra proposed systems. This study was conducted to see the incidence and clinical presentation of peripheral neuropathy in the patients with diabetic mellitus.

## MATERIALS AND METHODS

This cross sectional study was performed at medicine department of LUMHS with the duration of time February 2011 to January 2012. Total 200 cases were chosen in this study after diagnosis of diabetic mellitus, all the cases were selected above the age 30 years. All the cases with diabetic mellitus those were agree to participation were preferred. Full medical history of the cases with complete physical examinations was carried out. All equitable lab investigations were carried out along with HbA1C. All the cases were excluded from the study those which were less than 5 HbA1c level, any trauma leading to neurological deficit that can compromise assessment of sensory system along with history of renal failure. Neuropathy degrees were done on the basis of TCSS score utilized in the previous study as {no neuropathy:  $\leq 5$ , mild: 6-8, moderate: 9-11 and severe:  $\geq 12$ }.<sup>11</sup> All the data regarding demographic characteristics, incidence of and clinical presentation of the cases with peripheral neuropathy was entered in the predesigned Performa.

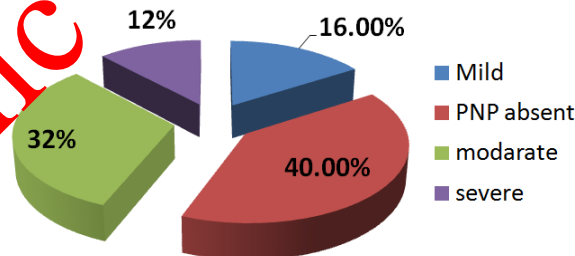
## RESULTS

Total 200 known diabetic cases were selected in the study; patients mean age was  $56.3 \pm 10.21$  years. High difference was not found in male and female, as male 104(52.0%) and female 96(48.0%). Mostly cases were noted from urban area 120(60.0%), while 80(40.0%) cases were comes from rural areas. 92(46.0%) cases were smoker and mostly male, while 26(13.0%) patients (totally male) were with history of alcohol consumption. Mostly patients were poor socioeconomically. **Table 1.**

16% cases were found with mild neuropathy, 21% were with severe while majority of the cases 32% were found with moderate neuropathy. **Figure 1**

**Table No. 1: Demographic characteristics of patients (n = 200)**

Basic status	No. of patients/percentage
Age (Mean+SD)	56.3 + 10.21
<b>Gender</b>	
Male	104(52.0%)
Female	96(48.0%)
<b>Residence</b>	
Rural	80(40.0%)
Urban	120(60.0%)
<b>Smoking status</b>	
Yes	92(46.0%)
No	108(54.0%)
<b>Alcohol consumption</b>	
Yes	26(13.0%)
No	124(58.0%)
<b>Obesity</b>	
Yes	37(18.5%)
No	163(81.5%)



**Figure No.1: Incidence of Peripheral Neuropathy. n=200**

**Table No. 2; Presentation of the cases with PN n=120**

Presentation	Frequency/percentage
Burning	102(85.0%)
Pain	80(66.6%)
Sensitive touch	60(50.0%)
Numbness	90(75.0%)
Itching	36(30.0%)
Foot ulcer	18(15.0%)
Muscle cramp	45(37.5%)
Tingling	51(42.5%)

According to the clinical presentation mostly cases were found with burning, 102(85.0%), Pain was found in 80(66.6%), numbness was found in 90(75.0%), while Sensitive touch, Itching, Foot ulcer, Muscle cramp and Tingling were found as 60(50.0%), 36(30.0%), 18(15.0%), 45(37.5%) and 51(42.5%) respectively.

**Table 2.**



## DISCUSSION

Diabetes one of the common cause of different complications in the patients as renal disease, blindness and lower leg amputation even though the occurrence of different treatment approaches these all supply to the excess morbidity as well as mortality in the cases with diabetes.<sup>12</sup>

In this series mostly cases were found with old age above 40 years, only few cases were noted with age of less than 40, as well as mean age of the cases was found mean+SD 56.3 + 10.21. Similarly Iftikhar M. et al<sup>13</sup> reported mean age of the cases as mean+SD 49.52±7.933. Salzedas Muniz EC et al<sup>14</sup> reported mean age as 60.9 years. Al-Sarihin K et al<sup>15</sup> mentioned mean age of the cases as 56.19±14.31 years.

High difference was not found in male and female, as male 104(52.0%) and female 96(48.0%).

Mostly cases were noted from urban area 120(60.0%). 92(46.0%) cases were smoker and mostly smokers were male. A.B. Zafar et al<sup>16</sup> stated 49 male and 50 female in his study. Iftikhar M. et al<sup>13</sup> and Al-Sarihin K et al<sup>15</sup> also reported similar findings of gender, residence and smoking status.

PDN is probably main complication that's affects are concern to sensory, autonomic, and motor neurons of the peripheral nervous system. WHO reported that about fifty percent in diabetic patients develop neuropathy.<sup>17</sup> With increase time of diabetic, DN risks also increase. It is reported that 60 to 70% neuropathy developed in cases with diabetes.<sup>18</sup> Iftikhar M. et al<sup>13</sup> stated incidence of DN in diabetic patients was 127 (74.8%). Feray Soyupek *et al*<sup>19</sup> mentioned that in the study frequency of peripheral neuropathy was 80.4%. While in this study 60% patients were found with peripheral neuropathy, out of them 16% cases were found with mild neuropathy, 21% with severe while great part of the cases 32% were found with moderate neuropathy, similarly Davies M. et al<sup>20</sup> found neuropathy as mild 20%, moderate 47%, or sever 33%. Clinical pattern DPN is associated that incorporates troublesome pain toward one side and there may be unfeeling foot on the flip side that likewise at danger of ulceration. In the advanced PDN the raised vibration and warm discernment edges that prompts degeneration and the sensory loss of total categories in peripheral nerve of the fibers. According to the clinical presentation in the present series out of 120 patients mostly cases were found with burning, 102(85.0%), Pain was found in 80(66.6%), numbness was found in 90(75.0%), Sensitive touch 60(50.0%), Itching 36(30.0%), Muscle cramp 45(37.5%) and Tingling were found in 51(42.5%) patients. Iftikhar M. et al<sup>13</sup> stated that Out of 250 patients 116 (46.4 %) cases noted with burning type pain and 114 (45.6%) were found to have numbness while 61 (24.4%) had tingling. Out of 250 patients 17 (6.8%) were found to have sharp

pain and 55 (22%) had dullness. Out of 250 patients 44 (17.6%) had coldness. Katulanda P et al<sup>21</sup> reported patients with established diabetes the most common symptom was the presence of numbness 37.1%, followed by burning, aching or tenderness of the feet 32.3%, prickling sensation 29.7% and unsteadiness 25.5%.

Initial screening of PDN is basic in light of the fact that patients of all phases of neuropathy are at a more serious danger of creating uncaring foot ulceration. The group based study directed at Karachi, Pakistan stated that DPN developed in the around 40% cases, and out of them 4% foot ulcers developed.<sup>22</sup> likely in another study consider that development of diabetic neuropathy is 36%, and foot ulcer 10.4% in diabetes cases.<sup>23</sup> As well s in the present study PDN was found 60% and 15.0% patients were found with foot ulceration..

## CONCLUSION

In this study it is concluded that diabetic peripheral neuropathy is increased with the increasing time of diabetes, causing uncontrolled and ignored diabetes and male/female are involved. Majority of the cases had found with sensory loss having foot ulcers, and they were unaware regarding this condition. Government should facilitate the diabetic patients regarding awareness and complete treatment, because in this study mostly patients were poor socioeconomically. More research is needed to better identification of factors associate to DPN.

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

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# Results of Comparative Study of Fractures Fixed with DCP and Nailing

1. Syed Habib Ullah Shah 2. Ishfaq Ahmad

1. Asstt. Prof of Orthopaedic, 2. SMO Orthopaedic Surgery, Ghazi Khan Medical College, D.G.Khan

## ABSTRACT

**Introduction:** The treatment methods of the fractures of humerus are treated in many ways. Interlocking nails and plates have both stood the test of time but the present study looks at both methods scientifically.

**Study Design:** Prospective, comparative study

**Place and Duration of Study:** This study was carried out at Ghazi Medical College, D.G.Khan from 07.01.2013 to 25.02.2015.

**Materials and Methods:** A total of 40 patients were included in the study. It was a study of two groups of patients of fractures of humerus treated with dynamic compression plate versus with interlocking nails.

**Results:** Fractures in both groups healed uneventfully without significant complications.

**Conclusion:** Both modes of treatment can be recommended for the treatment of fractures of the shaft of Humerus with minimal chances of complications.

**Key Words:** humerus, Interlocking

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## INTRODUCTION

Fractures of shaft of humerus make up 3% of all fractures.<sup>1-3</sup> Typically these are the results of direct trauma to the arm which causes transverse or comminuted fractures. They also occur after falls in sports like base ball or wrestling, where rotational force leads to spiral fractures.<sup>2</sup> A fall on elbow with arm abducted leads to oblique and transverse fractures of the shaft of humerus. Fractures of the shaft of humerus in an elderly patient may be due to metastasis.<sup>3</sup> Fractures of middle and distal third of the shaft of humerus can injure the radial nerve.<sup>4</sup> Vascular injury results from humeral shaft fractures in a small percentage of cases.<sup>3</sup> Such fractures when dealt by quacks with poor and insufficient techniques result in malunion or nonunion leading to disability. Most acute humeral shaft fractures can be treated conservatively with plaster of Paris splint and casts. With increasing number of vehicles on the roads multiple fractures are commoner than before necessitating need for internal fixation in many. Due to improved designs of implants and surgical techniques operative treatment of humeral shaft fractures has gained more acceptance.<sup>1</sup>

Literature shows that interlocking nail is a preferred treatment option for fractures of shaft of humerus in selected cases like comminuted fractures, segmental fractures and in poly trauma patients to get early mobility, good alignment and control bending forces. Lim K.F2001, published the results of retrospective

study of 78 humeral shaft fractures and concluded that plating allows anatomical reposition of most fractures with little risk of infection, mechanical problems and failure of healing, however there is danger of radial nerve injury.<sup>13</sup> Lin J (2001) concluded from 48 patients of his study that humeral locking nailing after a less invasive surgical technique and more favourable treatment results than did plate fixation.<sup>13</sup>

Chapman (2002) in his study, concluded that both procedures provide predictable methods for achieving fracture stabilization and ultimate healing.<sup>13</sup> Chen et al, reported that in their study they had noted that radial nerve palsy is found in patients of lower third of femoral shaft fractures treated with plating while with interlocking nailing the chronic shoulder pain noted in most of the patients.<sup>10</sup> Current practices of operative management of these fractures favor intra medullary nails over plates.<sup>3,4</sup> Very little effort has been made locally to document the benefits of each technique scientifically. This study was undertaken to compare use of both these techniques in a prospective manner.

## MATERIALS AND METHODS

This is a prospective, randomized and comparative study of 40 cases of humeral shaft fractures in adults treated by open reduction and internal fixation with interlocking nails versus AO dynamic compression plate. All cases were managed in the department of orthopedic, Ghazi Khan Medical College Teaching Hospital D.G.Khan including all patients who presented to emergency or outpatient department of the hospital. The number of cases was forty who were divided into two groups at random (allocating odd numbers to Group A (Twenty cases in this group were managed

**Correspondence:** Syed Habib Ullah Shah,  
Asstt. Prof of Orthopaedic, Ghazi Khan Medical College,  
D.G.Khan  
**Cell No.:** 0334-7473540  
**E-mail:** drsyedhabib67@gmail.com

with dynamic compression plate (DCP) and even numbers to Group B (Twenty cases were managed by static intramedullary interlocking nail (ILN). as they presented.

## RESULTS

In forty patients 30 were male and 10 were female (male to female ratio was 3:1). The average age was years (range 15–40). Out of 40 patients 30 had road traffic accidents (75%), 05 (12.5%) had fall from height while remaining 05 (12.5%) had sports injury. Right side was involved in 25 (62.5%) cases while remaining 15 (37.5%) cases involved left side. All 40 cases had closed fractures. According to A.O classification 20 (50%) patients with simple fractures (type A), 14 (35%) with wedge fractures (type B) and remaining 06 (15%) with complex fractures (type C). Associated injuries occurred in 25 (62.5%) of these cases, 06 (15%) patients had head injury, five (12.5%) cases with abdominal injuries, 04 (10%) with chest injuries and remaining 10 (25%) cases reported with multiple fractures. Out of all patients 20 cases were operated in first seven days and other 20 were operated in second week. Hospital stay in group A patients ranged from 10 to 14 days (average 12 days) while in group B patients hospital stay was 9–13 days (average 11 days).

Operating time in group A patients i.e. plate fixation was 70–80 minutes (average 75 minutes) while in patients treated with interlocking nail operating time was 65–75 minutes (average 70 minutes). Average blood loss in a single case treated with plating was about 200 cc while in patients treated with closed interlocking nail was 10–20cc.

Out of the patients managed with plating, 15 (95%) returned to their daily activities and even weight lifting and over head works in seven months i.e. had excellent results, only 1 patient (5%) returned to their work after 12 months due to postoperative radial nerve palsy while no patient had non union or poor results. On the other hand in case of interlocking nail 18 cases (90%) have excellent results i.e. assumed their routine activities in 06 months, 02 patients (10%) had good results i.e. return to work after 8 months and no patient had poor results.

In the present study shoulder pain was in 10% (2) cases, due to damaged and unrepaired rotator cuff in one case and in second one due to failure of proximal locking mechanism leading to protrusion of nail above the humeral tuberosity. Symptoms resolved after 2 months of rotator cuff repair while in second case after the removal of the nail patient achieved shoulder function. There is no statistically significant difference in both series and either of both methods of treatment, properly selected and performed should lead to successful results in a large majority of patients.

## DISCUSSION

Isolated low energy humeral shaft fractures can be treated satisfactorily conservatively.<sup>1</sup> But operative stabilization is often necessary for acute high energy humeral shaft fractures so that fracture alignment and better functional results can be achieved.<sup>5</sup> When compared it is still difficult to declare as to which is the most suitable operative method for humeral fracture treatment.<sup>6,7</sup> Cox MA in studies about Russel Taylor nail reported 88% patients with excellent recovery of shoulder functions according to the Neer Score.<sup>8</sup> Postoperative pain was mostly due to proximal locking screws.<sup>9</sup> Crates and Whittle reported 90% of the patients treated with interlocking nail had satisfactory shoulder functions.<sup>10</sup>

The most frequent criticism of ante grade humeral locking nailing has been its potentially deleterious effect on shoulder functions. Reimr et al (2001) also reported that 05 of 12 patients in whom a Siedel nails were inserted through a lateral deltoid incision had persistent shoulder stiffness. In the patients in the said study and our group the nails were inserted through anterior deltoid incision had restricted shoulder movements; however it sometimes took as many as six months for full shoulder functions to return.<sup>11</sup> Nailing is considered to be a minimally invasive procedure with less complications as compared to plating. While some of surgeons still favor plating in selective cases like simple fractures, proximal and distal humeral fractures and fractures with neurovascular injuries.<sup>14</sup> Although plating is invasive and prone to radial nerve injury but careful exposure to radial nerve and proper fixation of the plating on fracture site yields high compression and rigid fixation than nailing.<sup>15</sup>

In present study the union rate in both group of patients was 100%, infection rate in both groups is zero and no permanent neurological deficit is noted. In interlocking nail series two patients have shoulder pain but relieve. One patient with plate fixation had arm pain but relieved while one patient had radial nerve palsy which recovered spontaneously. Although our study is small in scale and short in duration for lack of a prolonged follow up yet the similar results produced point to the fact that both procedures are safe. There seems to be very little difference in morbidity of each and these both can be recommended for use in internal fixation when proper indications are kept in mind.

## CONCLUSION

Interlocking nailing and AO Dynamic Compression Plating both are safe procedures for fixation of humeral fractures and can be expected to be low in morbidity giving rise to good functional rehabilitation.

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



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# Return to Sports Following Anterior Cruciate Ligament Reconstruction – Short Term Follow Up

1. Muhammad Khalid ur Rehman 2. Sharif Saleh Kashlan 3. Roomana Akhlaque  
4. Ahmad Masood Alfaify

1. Asstt. Prof. of Orthopaedic Surgery, Sargodha Medical College, Sargodha 2. Chief of Orthopaedics (Consultant), Deptt. of Orthopaedic Surgery, King Abdul Aziz Hospital, Jeddah, Saudi Arabia 3. Registrar, Deptt. of Plastic and Reconstructive Surgery, Jinnah Burn and Reconstructive Center, AIMC, Lahore 4. Consultant Orthopaedic Surgeon, Deptt. of Orthopaedic Surgery, King Abdul Aziz Hospital, Jeddah, Saudi Arabia

## ABSTRACT

**Objective:** To determine the factors which will help in return to the sports the following anterior cruciate ligament reconstruction and compare the study results to the previous international results.

**Study Design:** Prospective descriptive case series study.

**Place and Duration of Study:** This study was carried out at the Department of Orthopedic Surgery, King Abdul Aziz Hospital Jeddah from June 2011 to May 2014.

**Patients and Methods:** 40 patients were included in this study. These patients were admitted in the Department of Orthopedic Surgery one day before and performed arthroscopic assisted ACL reconstruction at King Abdul Aziz Hospital Jeddah with anterior cruciate ligaments tear and  $\pm$  meniscal injuries. Those patients having associated meniscal injury were included and dealt arthroscopically. The patients were excluded from the study who had associated fracture and also posterior cruciate injuries.

**Results:** The mean age of patients was  $22.0 \pm 8.0$  years. All the patients were male and soccer players. The mode of injury was sports. The hamstring tendons were taken and applied as grafts in all the cases. Rehabilitation protocol was carried out in the postoperative period in routine rehabilitation clinics. The factors responsible for the determination of the return include age of the patients, how complex injuries, the psychological motivation and delay in surgery. The data was collected and analyzed with the self-generated questionnaire performing taking the help of Lysholm Knee Scoring System. The psychologically strong patients with will and wish were excellent in return to their sports activity.

**Conclusion:** Rehabilitation compliance for the young psychologically motivated individuals operated early were having best score with excellent return to sports. So these factors should be considered before the consideration of ACL reconstruction.

**Key Words:** Anterior cruciate ligament (ACL), Knee arthroscopy, Bone tendon Bone grafting (BTBG)

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## INTRODUCTION

The incidence of ACL return in adults is reportedly 6% of all the injuries.<sup>1</sup> The population based studies show the increasing incidence in the young population of KSA. The indication for the reconstruction of such patients includes the instability, pain and will or wish of patient to return to sports activity at pre-injury levels. The incidence of subsequent meniscal and subchondral/chondral level damage is around 65-70% in patients who after the injury are not willing for surgery. In KSA most of the patients are male with history of sports injuries at any of the levels. All patients are very much enthusiastic to return to the pre-injury levels of sports but the incidence of re-injury to the same knee or

contralateral knee injury range from 20-30%. It was examined that the information is lacking regarding the appropriate criteria for releasing such patients to unrestricted sports activity in postoperative period. In the review of the literature three objectives criteria were used for all to release for such sports activities. The most common is the lower limbs muscle strength and parameters for knee motion and swellings. Return to participate in sports at pre-injury level is an important outcome measure when evaluating the success of reconstruction of ACL reconstructed patients. When studied to review the literature we found that two out of three individuals returned to their pre-injury level of sports participation and approximately half of them return to the competitive sports.<sup>1</sup> In Cohort studies only 6 of 48 studies in the original reviews that report was return to sports was considered at pre-injury levels as primary outcome.<sup>2-3</sup> The WHO though intervention classification of functioning, disability and health has

**Correspondence:** Dr. Muhammad Khalid ur Rehman,  
Assistant Professor, Department of Orthopaedic Surgery,  
Sargodha Medical College, Sargodha  
Cell No.: 00920300-9404247  
E-mail: rehmanurgeon@gmail.com

called for emphasis of health outcome evaluation to be on an individual ability to participate in society. The primary aim of our study is to determine the factors which help to improve the outcome for return of those patients to pre-injury levels of sports activity.

## MATERIALS AND METHODS

The 40 patients were included in the study. Cases who were evaluated before surgery by a self generated questionnaire and were underwent the surgery on their turn in the department. Before surgery rehabilitation especially the quadriceps strengthening exercises were carried out. On the day of surgery the patients were given general anesthesia. Tourniquet was applied with inflated pressure up to 350mmHg. Before the application of tourniquet examination under anesthesia was carried out and the clinical findings were confirmed by the operating surgeon. The hamstring tendons harvested and prepared with pre-tensioning of the semitendinosus and gracilis tendons graft. Arthroscopy was carried out and the clinical findings were matched with MRI reports. Any associated meniscal injury also noted and documented. The tunnels were made and graft applied. Femoral side of graft enclosed with endobutton of appropriate size and the tibial side anchored with absorbable screw. Arthroscopic Normal saline lavage carried out and wound closed in layers. ASD done. Knee immobilizer applied and patients shifted to ward with knee immobilizer on and were discharged on 2<sup>nd</sup> day of surgery. The patients were called in the clinic after 10 days for wound/knee examination and stitches removal. The rehabilitation programme which was standard in the physical therapy department of the hospital was initiated post operatively. Patient kept on follow up in the clinic on regular appointments. After 6 weeks of the rehabilitation the patients were advised to do the flexion also beyond 90° and full weight bearing later at 2 months of follow up. They were advised to do brisk walking as tolerated. The quadriceps strengthening exercises were key to success in the patients who were having ACL reconstruction. It is expected that patients having good quadriceps functional strength also had very good postoperative rehabilitation and outcome.

## RESULTS

The patient data was entered in the self generated performa. The entries were made from the start of study to the end of one year follow up. The factors were categorized in the tabulated form for all the patients. The Lyshola Scoring System was utilized both in preoperative and postoperative one year follow up and the values were compared. All the 40 patients were followed up in the clinic on regular basis. The young patients were more motivated and psychologically strong to make the decision of rehabilitation. All the patients

were soccer players out of them 80% were the competitive young players and 20% were non regular soccer players (Table 1). In these 40 patients meniscal injuries were also found. 55% of the patients were having non-complex injuries. 45% of the patients were having complex injuries (Table 2). Out of these complex injured patients 61% having medial meniscal tear and 39% having lateral meniscal tears which were dealt arthroscopically. There were more young patients with mean age  $22.0 \pm 8.0$  years (Table 3). Most of the patients were operated within the two years interval from the injuries as 52% within the one year time, 37% between 1-2 years interval from their initial injuries. The infection rate in the study was very low 2 (5%) which were treated in the form of second surgery of arthroscopic lavage and I/V antibiotics.

**Table No.1: Level of sports activity**

Type of sports	No. of Patients	Percentage
Competitive soccer players	32	80.0
Non regular occasional soccer players		20.0

**Table No.2: Frequency of type of injury**

Type of injury	No. of Patients	Percentage
Noncomplex injury (without associated meniscal tear)	22	55.0
Meniscal tear	18	45.0
Medial meniscus	11	61.0
Lateral meniscus	7	39.0

**Table No.3: Age distribution of patients**

Age in years	No. of Patients	Percentage
<20	12	30.0
20-23	23	57.5
>23	5	12.5

**Table No.4: Outcome**

Interval from surgery	Infections	Range of movements at 1 year
<1 year 21 (52.5%)	No infection 38 (95%)	<90° 3 (7.5%)
1-2 years 15 (31.5%)	Mild to moderate 2 (5%)	0-100° 5 (12.5%)
>2 years 4 (10%)	No severe infection	0-120° 32 (80%)

**Table No.5: Lysholm Scoring System**

Score	No. of Patients	Percentage
94	30	75.0
83	8	20.0
71	2	5.0

In one patient the infection was superficial and healed with antibiotics. These patients remained in the hospital for 5-7 days. At one year follow up the range of movements was significantly good to excellent in more than 90% (Table 4). In the Lysholm Scoring System most of the patients fall in the category of good to excellent type 95% in comparison to their previous scores when they were evaluated in the same performance before surgery. Lysholm scoring was good to excellent in 75% patients, good in 20% and 5% fair (Table 5). In our study most of the patients return to the pre-injury level (n=32) and some non compliant patients have problem of knee swelling, pain so were not interested to participate in competitive sports (Table 6).

**Table No.6: Return to sports of pre-injury level**

Pre-injury level	No. of Patients	Percentage
Return	32	80.0
Non return	8	20.0

## DISCUSSION

When I can play doc? This is the question which is most frequently asked even by the patients, their parents and team mates, so it implies to meet the expectations of the athletes and it demands swift surgical approach and accelerated rehabilitation protocols to follow. Measures by this standard of the sports medicine made a giant advancement in the reconstruction of ACL. The surgery has progressed from open ACL reconstruction with BTB to minimal invasive arthroscopic surgery in such patients from extended casting to minimal bracing, from inpatient admitted patients for many days to using hamstring tendons day surgery or one day stay and at the end the accelerated rehabilitation programme resulting the best outcome in the shortest possible time duration.

Interval from injury to the arthroscopic surgery can be reduced to few weeks time of the injury. The follow up studies of our patients in the form of return to competitive sports and risk of re-rupture in one year follow up time should be considered. For athletes who want to return to pivoting sports, they should start the activity when they are able to achieve full range of motion (4-8 weeks) after rehabilitation. Some studies suggest that good to fair functional outcome and return to the pre-injury sports level – within next one year<sup>2,3,4,5</sup> but have not even studied the rupture or contralateral knee injuries or plain.

A few studies are very much in interest to return the patients in follow up of first year as they are treating the specific population.<sup>6</sup> In some long term follow up studies with mixed sports population. Fink et al found that 44% of patients return rate in surgically treated patients.<sup>7</sup> In non-treated (conservative) patients in vary long studies of 14 years follow up 6% of surgically treated patients were able to play the complete sports

in comparison to the conservative patients, in which only 1% were able to resume the sports at competitive levels.<sup>8</sup>

In short follow up period of -3 years 65% were actively participating the soccer at pre-injury level in comparison to the conservatively treated patients in whom only 20% were able to play soccer but not at competitive levels. It has been considered at the longer follow up that returning to competitive sports for patients who had been treated surgically in the form of ACL reconstruction rate is higher to return to pivoting sports activity than the patients without a reconstructive procedures results in considerable risk of injuries to the meniscus and cartilages.<sup>3</sup> It is also noticed that these after further damage to the patients knee and its structures with continued sports activity is a noticeable concern in non-operated cases.<sup>9</sup> The studies shows the rate of redo surgery or surgery for the other structures in knee is higher in conservatively treated patients. International literature shows 32% of the non-operated patients had an extra surgery for meniscus or cartilage damage as compared to 12% for post ACL reconstructed cases.

## CONCLUSION

The ACL reconstruction with arthroscopic assisted hamstrings grafts are the ideal treatment and most of the young, psychologically motivated patients return to the sports close to the pre-injury levels. All the factors should be kept in mind before making the decision of surgery in such patients.

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

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# Mean Platelet Volume in Diabetic Retinopathy and its Association with Duration of Diabetes and Glycaemic Control in Type 2 Diabetics

1. Iqbal Ahmed Memon 2. Rajesh Rathi 3. Afsheen Kazi

1. Asstt. Prof. of Medicine, LUH, Jamshoro, Sindh 2. Asstt. Prof. of Ophthalmology, MMC, Mirpurkhas, Sindh

3. Asstt. Prof. of Pathology, IMC, Tando Muhammad Khan, Sindh

## ABSTRACT

**Objective:** To study the mean platelet volume (MPV) in diabetic retinopathy (DR) with special reference to duration of diabetes and glycaemic control (HbA1c) in type 2 diabetics (DM).

**Study Design:** Case control study

**Place and Duration:** This study was carried out at the Department of Medicine, Liaquat University Hospital Jamshoro, from March 2014 to December 2014.

**Materials and Methods:** 100 subjects; comprising of 50 controls and 50 cases of DM were selected as per criteria and evaluated for study variables. Blood sample were collected in anticoagulant, sterilized bottles for analysis of hematoanalyzer. Volunteers were requested to sign the informed consent proforma. *Statix 8.1* was used for data analysis. Pearson's correlation (r), student t test and Chi square were used for data analysis.  $p \leq 0.05$  was defined significant.

**Results:** MPV values were found raised in DR subjects compared to controls i.e.;  $11.7 \pm 3.2$  fl versus  $9.12 \pm 2.1$  respectively ( $p < 0.0001$ ). MPV was positively correlated with HbA1c ( $r = 0.740$ ,  $p$ -value = 0.0001) and duration of DM ( $r = 0.510$ ,  $p = 0.0001$ ).

**Conclusion:** The present study reports raised mean platelet volume was diabetic retinopathy which was positively correlated with HbA1c and duration of diabetes.

**Key Words:** Mean Platelet Volume, HbA1c, Diabetic retinopathy

**Citation of article:** Memon IA, Rathi R, Kazi A. Mean Platelet Volume in Diabetic Retinopathy and its Association with Duration of Diabetes and Glycaemic Control in Type 2 Diabetics. Med Forum 2015;26(8): 58-61.

## INTRODUCTION

International Diabetes Federation (IDF) reported a rise of diabetics from current 285 millions in 2010 to 439 in 2030.<sup>1</sup> Presently, Pakistan occupies sixth position as regards load of diabetics in the country.<sup>2</sup> Diabetic patients (DM) are prone to damage their organs such as retina/eye, brain nerves, renal tissue, heart and vascular system.<sup>3</sup>

Platelet is the smallest blood formed element which plays role in hemostasis. A change in its morphology has been documented in the chronic hyperglycemic states as DM.<sup>4</sup> Mean platelet volume (MPV) is a morphological measure of platelet defined as a measure of average size and function.<sup>4</sup> MPV is determined at the bone marrow and is an indicator of megakaryocytes ploidy. As the megakaryocytes lyses in the bone marrow, it results in the formation of pre- and pro-platelet formation. MPV is a determinator of its dispersion, which is affected by various cytokines such as IL-6, IL-11 and thrombopoietin (TPO).<sup>5</sup>

These cytokines directly or indirectly affect mega-

karyocytes ploidy, hence platelet size varies and they may be larger in size and physiologically more reactive.<sup>6</sup> A change in megakaryocyte ploidy, platelet morphology and mean platelet volume has been observed in DM. The MPV is an emerging indicator of microvascular complications in diabetics. A previous study concluded a raised MPV is an independent finding in T2DM.<sup>7</sup> This shows a tendency of thrombogenicity due to platelet with high MPV which are rich in granules. The size and granules content of platelets are independent to any of hormonal control. Changes in platelet don't occur in the peripheral circulation; hence they are indicator of bone marrow functioning in response to platelet utilization in diseases such as T2DM. Hence many studies had worked on the MPV as a risk factor of atheroma, & thrombo-embolic phenomena. Previous study reported MPV is an independent risk factor of cardiac disease, brain ischemia and albuminuria in T2DM.<sup>8</sup> Glycated hemoglobin (A1c) is a established indicator of glucose regulation in DM<sup>8,9</sup> and has been compared with MPV in previous studies.<sup>9,10</sup> However, A1C is costly, while MPV is cost effective and free of bias.<sup>11</sup> Hence, the present study is an investigation into the MPV and A1C in the T2MD subjects. Research was conducted to

**Correspondence:** Dr. Iqbal Ahmed Memon,  
Assistant Professor of Medicine  
Liaquat University Hospital Jamshoro, Sindh  
Cell No.: 0300-3019584  
E-mail: dri.memon@yahoo.com

evaluate & analyze MPV in diabetic retinopathy with special reference to duration of diabetes and glycemic control.

## MATERIALS AND METHODS

Case control study was conducted at the Department of Medicine, Liaquat University Hospital Jamshoro, from March 2014 to December 2014. 100 subjects; comprising of 50 controls (Group I) and 50 cases of DR (Group II) were selected as per criteria and evaluated for study variables. Diagnosed cases of age >25 but <70 years having DR of any stage/grade were included. Diabetics with renal failure, chronic systemic diseases, urinary tract infections, and anti-platelet or anti-coagulant therapy were excluded. Blood sample were collected in anticoagulant sterilized bottles for analysis of hematoanalyzer. MPV was defined as an average size of platelet (range 8–12 fl).<sup>5</sup> Systolic blood pressure  $\geq 140$  mmHg and/or diastolic blood pressure  $\geq 90$  mmHg were defined as “Systemic hypertension”.<sup>12</sup> DM was defined by American Diabetes Association criteria.<sup>3</sup> Study was approved by Ethics review committee. Volunteers were requested to sign the informed consent proforma. *Statistix* 8.1 was used for data analysis. Pearson’s correlation (*r*), student *t* test and Chi square were used for data analysis.  $p \leq 0.05$  was defined significant.

## RESULTS

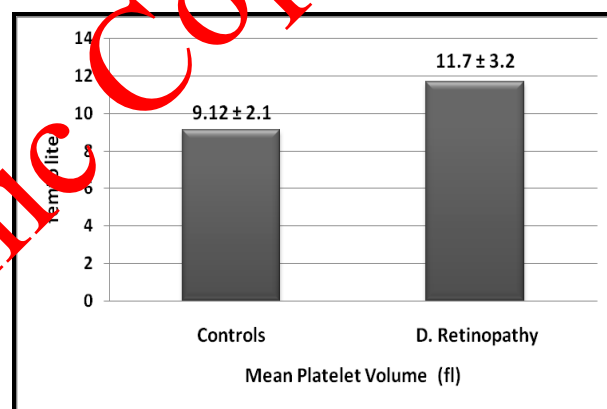
Demographic characteristics of study population are shown in table I. Mean  $\pm$  SD age noted in controls and cases was  $47 \pm 10.15$  and  $49 \pm 9.50$  ( $p = 0.83$ ) respectively as shown in table 1. Hypertension was noted in 31 (62%) of DR patients. Systolic BP in controls and cases was noted as  $124.86 \pm 9.29$  and  $168.1 \pm 18.15$  mmHg respectively while diastolic BP

was noted as  $65.7 \pm 10.9$ , and  $88.1 \pm 18.5$  mmHg respectively.

Male population predominated in present study. Random blood sugar and glycated hemoglobin A (HbA1c) revealed a poor glycaemic control ( $p = 0.0001$ ). HbA1c was noted as  $9.3 \pm 3.12\%$  in DR subjects which indicates a bad glycaemic controls.

The platelet counts in controls and diabetic groups were similar in groups I and II ( $p = 0.06$ ) (Table I). Age, gender and BMI showed no correlation with platelet counts as indicated by ( $r = 0.12$ ,  $p = 0.067$ ), ( $r = 0.13$ ,  $p = 0.61$ ) and ( $r = 0.18$ ,  $p = 0.91$ ) respectively. Platelets showed  $-ve$  correlation with MPV ( $r = -0.6$ ,  $p = 0.4$ ), A1c ( $r = -0.22$ ,  $p = 0.001$ ) and duration of hyperglycemia ( $r = -0.1$ ,  $p = 0.2$ ).

High MPV values were found in DR subjects compared to controls (Table. I). MPV was raised in DR subjects, i.e.;  $11.7 \pm 3.2$  fl versus  $9.12 \pm 2.1$  in controls ( $p < 0.0001$ ) (Table I). MPV showed  $+ve$  correlation to HbA1c ( $r = 0.74$ ,  $p$ -value =  $0.0001$ ) and duration of DM ( $r = 0.510$ ,  $p = 0.0001$ ) and correlation was not observed with age and gender.



Graph No.1: Bar graph showing MPV in controls and D. Retinopathy study subjects

Table No.I. Demographic characteristics of study population (n=100)

	Group I (Controls) (n=50)	Group II (D.Retinopathy) (n=50)	p-value
Age	47±10.15	49±9.50	0.83
Male	34 (68%)	35 (70%)	0.75
Female	16 (42%)	15 (30%)	0.91
BMI (kg/m <sup>2</sup> )	26.5±7.8	27.7±9.5	0.043
Duration of DM	-	15.7±3.5	-
Hypertension	12 (24%)	31 (62%)	0.0001
Random blood glucose (mg/dl)	132±23.5	289±45.9	0.0001
HbA1c	5.4±1.3	9.3±3.12	0.0001
Microalbuminuria	0 (0%)	49 (98%)	0.0001
WBC (/μL)	7900±3.10	7700±2.90	0.061
RBC (x10 <sup>9</sup> /μL)	4.23±1.1	4.92±2.1	0.023
Platelet (x10 <sup>9</sup> /μL)	3.53±1.1	3.02±2.1	0.06
MPV (fl)*	9.12±2.1	11.7±3.2	0.0001

\* femto-liter

## DISCUSSION

Diabetic vasculopathies are grave complications of long standing T2DM. Diabetic vasculopathies are associated with increased morbidity and mortality and are caused by level of glycemic control.<sup>13</sup> Previous studies had reported raised MPV occurrence in the MD as an indicator of microvascular and macrovascular complications.<sup>14-16</sup> Present study found and reports MPV raised in subjects, the findings are consistent to previous report.<sup>14</sup> MPV is considered a marker of platelet reactivity and larger platelets are more reactive and cause vascular damage.<sup>17</sup> Possible mechanism of platelet dysfunction DM are; osmotic injury and glucose mediated structural and functional impairments.<sup>18</sup>

Observations of current study are similar to as above. A few of previous study could not evidence association of MPV and A1C.<sup>19-21</sup>

A study<sup>24</sup> showed correlation of MPV and DM duration while others could not prove<sup>22, 25</sup> It may be concluded by observed findings that the MPV is dependently associated with DM & DR as has been cited.<sup>13,14,16,26</sup> In present study, MPV in DR was raised compared to normal control. MPV showed a positive correlation with glycaemic status and duration of DM. A previous study<sup>20</sup> has reported that MPV was corrected once A1C was controlled. Raised MPV is an important finding because of (i) it suggests a role of MPV in DR and (ii) the potential role of platelets in the pathophysiology of micro vascular complications. Platelet consumption occurs in diabetics is inversely associated with raised MPV to meet the haemostatic demands<sup>27</sup>; this finding is confirmed in present study. Systemic hypertension was not proved to having any correlation with MPV in present study and is consistent to a previous study,<sup>28</sup> while others had shown strong association.<sup>29</sup> Raised MPV in diabetic retinopathy is a valuable findings of present study similar to cited.<sup>24,25</sup> It is proposed that the platelet may be targeted by drugs to overcome the notorious complication; the diabetic retinopathy.

In conclusion, the present study reports raised MPV in DR in type 2 diabetics who are associated with glycaemic controls and duration of diabetes. The present study has some limitations as of small sample size and various other risk factors which are not studied simultaneously. However, the findings are of clinical importance and future studies are recommended to establish the cause effect relationship.

## CONCLUSION

The present study reports that the mean platelet volume is raised in diabetic retinopathy and is positively correlated with duration of diabetes mellitus and glycaemic control.

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

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# When Drotaverine (No-spa) Injected in to the Perivascular Tissues of Internal Mammary Artery (IMA) Relives the Peri-operative Vascular Spasm and Increases the Blood Flow in IMA When Used as a Pedicle Graft in CABG

1. Muhammad Musharaf 2. Sanaullah Junejo 3. Iqbal Hussain Pathan  
4. Muhammad Jawad

1. Asstt. Prof. of Cardiac Surgery, NICVD, Karachi 2. Postgraduate Trainee, Deptt. of Cardiac Surgery, NICVD,  
Karachi 3. Fellow Paediatric Cardiac Surgery, NICVD, Karachi 4. House Officer, NICVD, Karachi

## ABSTRACT

**Objective:** To compare two groups of patients submitted to different modes of delivery of Drotaverine and its effect on internal mammary artery spasm during Coronary artery bypass grafting at The National Institute of Cardiovascular Diseases, Karachi.

**Study Design:** Experimental study.

**Place and Duration of Study:** This study was carried out at the National Institute of Cardiovascular Diseases Karachi from 1<sup>st</sup> Jan 2013 to 31<sup>st</sup> December 2013.

**Materials and Methods:** Data was analyzed from one hundred patients who underwent CABG at our institute. They were divided into two groups: Group 1 consisted of 50 patients in which Drotaverine (No-Spa) was sprayed topically over the IMA: Group 2 also consisted of 50 patients in which Drotaverine (No-Spa) was injected with blunt needle in the perivascular tissue of IMA.

**Results:** After Drotaverine application, the mean blood flow were significantly low in Group I was  $117.2 \pm 4.87$  ml/min as compared to Group II which was  $136.2 \pm 7.11$  ml/min ( $p < 0.01$ ).

**Conclusion:** Result of our study suggests ; Drotaverine injected perivascularly better relieves spasm of internal mammary artery and increases the blood flow .

**Key Words:** IMA (Internal mammary artery), CABG (Coronary artery bypass grafting), Drotaverine (No-spa)

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## INTRODUCTION

Coronary artery bypass grafting is the standard mode of treatment for multivessel coronary artery disease. Introduction of internal mammary artery (IMA) as pedicle graft to bypass left anterior descending artery has been shown to improve 20 years<sup>1</sup> results and all current consensus that the IMA as a conduit of choice for coronary artery bypass grafting (CABG). IMA as pedicle or free graft has better patency than all other conduits used in CABG surgery<sup>2</sup> and that also result in better freedom from angina and patient's survival<sup>2,3</sup>. Vascular spasm is an often observed event during IMA manipulation while harvesting and anastomosis. Internal mammary artery spasm not only make the anastomosis technically difficult but also by decreasing the blood flow which have impact on

morbidity/ mortality<sup>4,5</sup>, therefore it can influence decision for IMA usage as a conduit. Therefore, the intraoperative pharmacologic dilatation of the internal mammary artery has become a routine procedure in coronary artery bypass surgeries<sup>6,7</sup>. Papaverine is also used as spasmolytic agent during the IMA preparation<sup>8</sup> by many cardiac surgeons. Whereas our study is conducted on Drotaverine (also known as **No-Spa**) is an antispasmodic drug, structurally related to papaverine.

## MATERIALS AND METHODS

The study was conducted on 100 patients who underwent harvesting of the IMA by trained surgeons, planned for elective CABG between January 2013 to December 2013 at the National Institute of Cardiovascular Diseases Karachi. Exclusion criteria were emergency CABG, previous open heart operation and simultaneous cardiac procedures in which Left anterior descending artery was not a target vessel. Informed consent was taken from all patients. The range for subjects age were from 38 to 77 years (mean,

**Correspondence:** Muhammad Musharaf,  
Asstt. Prof. of Cardiac Surgery, NICVD, Karachi  
Cell No.: 0300-2314099  
E-mail: cautry50@gmail.com

56.8 years), 62 males and 38 females. Patients were divided into 2 groups prior to surgical incision: Group 1 consisted of 50 patients in which Drotaverine (No-Spa) was sprayed topically over the IMA: Group 2 also consisted of 50 patients in which Drotaverine (No-Spa) was injected with blunt needle in the perivascular tissue of IMA. A total of 60 mg of Drotaverine hydrochloride in 30 ml of saline solution (pH 5.1) was administered in every patient. Both groups were similar in terms of preoperative risk factors except coronary artery disease characteristics. 90 Patients had multi-vessel disease, 7 patients had significant left main along with 3 vessels disease and 3 patients had single vessel disease (left anterior descending artery). The left internal mammary artery was anastomosed to the left anterior descending artery (LAD) in 99 (99%) patients except in one case in which LIMA was anastomosed to the first large diagonal branch of the LAD because poor quality and short length of the target vessel.

**Technique:** Routine median sternotomy was performed. Left internal mammary artery was harvested with pedicle containing both satellite veins started proximally at the level of the subclavian vein up to the bifurcation of the vessel distally. Harvesting of LIMA was performed by trained surgeons with low power electrocautery and major branches were secured with metal clips. Heparin was then given systemically (400 units/kg); and subsequent to three minute wait, the LIMA was divided distally at its bifurcation and occluded with bulldog. In group I, diluted Drotaverine was applied topically over the internal mammary artery pedicle's whole length. In group II, the Drotaverine was injected into the perivascular tissue along the full length of the IMA with a blunt needle taking care not to injure the IMA. The mammary artery was left undivided wrapped in Drotaverine-soaked gauze to wait for anastomosis to the LAD. And it was anastomosed to LAD as the last of all distal anastomosis. Prior to anastomosis, the mammary artery was divided at its bifurcation. Blood flow was allowed free flow and collected into bowel for 1 minute under well controlled hemodynamic conditions, at 70 mm Hg. After the blood volume was documented, the collected blood was returned to the heart-lung machine through pump suckers.

## RESULTS

Both groups were well controlled with respect to mean arterial pressure at the time of blood collection. The Internal mammary artery harvest time  $26 \pm 6.7$  min were similar. There were no IMA injuries found during harvesting. After drotaverine application, the mean blood flow were significantly low in Group I as shown in figure 1. Group 1 patients have mean flow ( $117.2 \pm 4.87$  ml/min) as compared to Group II ( $136.2 \pm 7.11$  ml/min) ( $p < 0.01$ ) as shown in table 1. In one of the patients of Group 1, after the weaning of

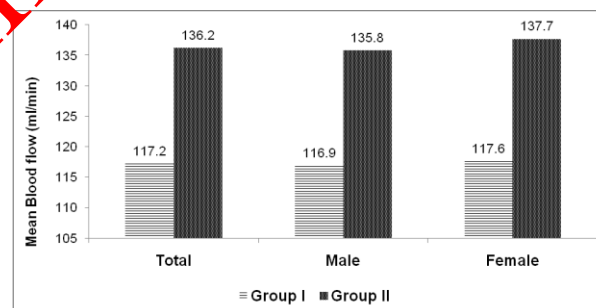
cardiopulmonary bypass, intra-aortic balloon pump was inserted due to low-output state and then it was removed on the 2nd postoperative day, when hemodynamic stabilization in the patient was observed. In Group I, ST elevation in anterior chest leads on electrocardiogram was observed in 3 patients. Two patients were re-opened due to postoperative bleeding. In one of these patients, bleeding was observed from the vascular bed of the LIMA and in second patient it was noticed from side branch of saphenous vein graft. The mean length of ICU stay was 3.2 days. The mean stay of hospitalization was 6.8 days post operatively. At the time of discharge all of the patients were ambulatory.

**Table No.1: Comparing flow rates in two groups**

Flow (ml/min)	Group I	Group II	P-value
	No. Mean $\pm$ S.D	No. Mean $\pm$ S.D	
Total	50 117.2 $\pm$ 4.87	50 136.2 $\pm$ 7.11	0.001
Male	31 116.9 $\pm$ 4.26	31 135.8 $\pm$ 6.79	0.001
Female	19 117.6 $\pm$ 5.72	19 137.7 $\pm$ 6.38	0.001

Statistically significant  $p < 0.05$

Group 1 consisted of fifty patients in which drotaverine (No-Spa) was sprayed and Group 2 also consisted of fifty patients in which drotaverine (No-Spa) was injected



Group 1 consisted of fifty patients in which drotaverine (No-Spa) was sprayed and Group 2 also consisted of fifty patients in which drotaverine (No-Spa) was injected

**Figure No. 1: Showing mean flow in Two groups**

## DISCUSSION

Internal mammary artery has established long-term patency rates, resulting in improved survival in patients underwent CABG<sup>1</sup>. Today, the use of arterial grafts have become routine in CABG<sup>9</sup>. IMA is always prone to spasm during CABG making accurate placement of sutures difficult<sup>8</sup>, therefore influencing quality of anastomosis resulting in morbidity and mortality. Different vasodilators are used to prevent LIMA spasm, but the best agent is not known<sup>10</sup>. Nevertheless Papaverine is the most studied agent clinically.

Papaverine hydrochloride is an alkaloid obtained from opium or prepared synthetically; it belongs to the benzyl iso quinoline group of alkaloids. A musculotropic agent, Papaverine reacts directly on vessel smooth muscle cells. It probably inhibits the catalysis of cAMP phosphodiesterase and the transmembranous transfer of calcium. It works independently of the resting innervation of vascular muscle. The effect of papaverine is particularly distinct when spasm (i.e., primary hypertonia of the smooth muscles) is present<sup>13</sup>. While in our study we are using a different agent **Drotaverine**, structurally related to papaverine. It is a selective inhibitor of phosphodiesterase 4; Drotaverine is sold under the brand name of **No-Spa**<sup>14</sup>. Drotaverine is a spasmolytic agent by inhibiting PDE4 in smooth muscle cells. it inhibits phosphodiesterases hydrolyzing cAMP, thereby increasing cAMP concentration, decreasing calcium uptake of the cells and changing its distribution among the cells. It may also have minor allosteric calcium channel blocking properties. Different methods of delivery of these agents to the LIMA has been describe like topical spray, perivascular injection, intraluminal administration and hydrostatic dilation. The most effective method of administration is still under discussion<sup>11, 12</sup>.

Cooper et al suggested sodium nitroprusside<sup>15</sup> most effective vasodilator compared to normal saline(placebo), papaverine, nifedipine, glyceryl trinitrate on IMA flow. Sasson and associate contradicted it suggesting that topical vasodilators have no significant effect<sup>16</sup>. Periarterial injection into the vascular pedicle is claimed by Hausmann et al as a better method of application<sup>17</sup>. Injecting Drotaverine with a blunt needle into the perivascular tissue of LIMA avoids injury to intima, while injecting the agent intraluminally may cause injury to intima and alters the blood flow in it. Also perivascular delivery allows for better exposure of Drotaverine to LIMA when harvested as pedicle graft over topical spray. This method of prolonged advenatual exposure of the drug increases duration of the agent's vasodilatory effects. Combine application of papaverin through both extraluminal and intraluminal exposure have better and prolonged effects on prevention of potassium induced contraction<sup>18</sup>. We have studied both methods of application, perivascular injection and topical spray of the Drotaverine on the IMA. Our findings suggest that significant flow increases (117.2 ml/min versus 136.2 ml/min) were observed in perivascular group. With methods used in our study, there were no complications observed. Drotaverine delivery to the perivascular tissues in LIMA harvesting treats spasm efficiently, increases blood flow, and is considered to be a safe and effective method to improve the quality of IMA.

## CONCLUSION

In this study it is concluded that diabetic peripheral neuropathy is increased with the increasing time of diabetes, causing uncontrolled and ignored diabetes and male/female are involved. Majority of the cases had found with sensory loss having foot ulcers, and they were unaware regarding this condition. Government should facilitate the diabetic patients regarding awareness and complete treatment, because in this study mostly patients were poor socioeconomically. More research is needed to better identification of factors associate to DPN.

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

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# Effects of Cement Dust on the Pulmonary Function Indices of Cement Factory Workers in Karachi

1. Muhammad Adnan Kanpurwala 2. Nazneen Rabia Zubair 3. Muhammad Tanveer Alam  
4. Muhammad Seraj Anwar

1. Asstt. Prof. of Physiology, Muhammad Bin Qasim Medical and Dental College, Karachi 2. Administrator, Hashmanis Hospital, Clifton, Karachi 3. Asstt. Prof. of Medicine, Civil Hospital, DUHS, Karachi 4. Student, Masters of Business Administration, Institute of Health Management, DUHS, Karachi

## ABSTRACT

**Objective:** It has been observed that exposure to cement dust has been found to be associated with impaired pulmonary function and lung diseases. Therefore, this study aims to determine the effects of chronic exposure to cement dust on the pulmonary function of cement mill workers (non smokers) and comparing it to non-exposed otherwise matched individuals.

**Study Design:** Cross sectional study

**Place and Duration of Study:** the study has been completed in duration of 4 months and the data was collected from a cement factory of Karachi.

**Materials and Methods:** A cross sectional study was carried out on a sample size of 100 cement mill workers who were divided into two groups of non-smoker exposed (n=46) and non-smoker, non-exposed (n=54) workers and matched for age, height, weight, BMI, duration of work and their PEFR and FEV<sub>1</sub> were observed using electronic peak flow meter.

**Results:** It has been found that there was no difference in the age, work experience, height, weight and BMI between the two groups while statistically significant difference was found in FEV1 between the two groups, while PEFR was found to be insignificant.

**Conclusion:** Occupational cement dust exposure is associated with impaired pulmonary functions which may lead to chronic lung diseases in these workers. This justifies the need to take preventive measures.

**Key Words:** Cement, PERF, FEV<sub>1</sub>

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## INTRODUCTION

Occupational lung diseases arise due to the exposure of an individual to the air born particles which are deposited in the respiratory system through inhalation [1]. For some, there is a clear cut correlation between the exposure and disease and/or impairment in the pulmonary function they cause. There are a vast number of respiratory diseases that are directly or indirectly related to work or occupation, the important of them being asthma, COPD, etc<sup>1</sup>. One such occupation where the impact has been observed is cement industry. Impaired pulmonary function in these workers due to exposure to cement dust has been reported by many researches, which showed that the work environment affects the health and normal function of the workers<sup>2,3</sup>.

Many researchers have associated cement dust as to be the direct and potential cause of the occupational pulmonary disease which causes damage to the protective mechanism<sup>3</sup>. The production of cement dust during heating a blend of limestone and clay, grinding, packaging and transporting can potentially lead to deposition of the cement dust particles in the tracheo-bronchial respiratory zone, thus leading to the impaired respiratory function and obstructive / restrictive lung diseases<sup>3,4</sup>. Some researchers have correlated the duration of exposure with the severity of lung function impairment, while few on the other hand also failed to prove such association<sup>4</sup>. Furthermore, continuous exposure to the cement dust particles ranging from 0.05 to less than 10 microns can be accumulated in the terminal airways and alveoli which may cause inflammatory and fibrotic changes in the lungs and may lead to restrictive and obstructive lung diseases<sup>3</sup>.

It has also been reported that the workers in the developing countries are not being provided with the protective tools or apparatus that could help minimize the exposure to the cement dust. Moreover, they belong to the low socioeconomic group and are not being provided with any training and precautionary

**Correspondence:** Dr. Muhammad Adnan Kanpurwala,  
Asstt. Prof. of Physiology, Muhammad Bin Qasim Medical  
and Dental College, Karachi  
**Cell No.:** 0300-2364983  
**E-mail:** drmuhammadadnan@hotmail.com

measures<sup>4,5</sup>. Chronic exposure to the cement dust can lead to the inflammatory changes in the skin, eyes and respiratory mucous membrane leading to chest tightness, dyspnea, and cough, leading to structural and functional abnormalities particularly affecting the pulmonary system. It has also been reported to cause the colonic carcinoma<sup>4,5</sup>.

This study aims to determine the effects of chronic exposure to cement dust on the pulmonary function of non smoker cement mill workers and comparing it with those of unexposed, non smoker individuals.

## MATERIALS AND METHODS

This cross sectional study was conducted in the city of Karachi, Pakistan. The data was collected from the workers of a private cement factory of the city, who were having a work experience of at least 1 year. Individuals with chronic diseases like COPD, diabetes mellitus, anemia, malignancies, smokers and drug addict were excluded from the study. Those having deformities of vertebral column, thoracic and musculo-skeletal system or who have undergone thoraco abdominal surgeries, chronic exercisers, and those who work in industry other than cement were also excluded from the study. After initial interview, two groups were formed out of a sample size of 100 volunteers, out of which 46 were those who were apparently health, non smoker, exposed mill workers, aged between 20-60 years and worked for 8 hours/ 6 days a week to occasionally 16 hours/ 6 days a week. These were the individuals who were indifferent about using personal protection equipments like masks, goggles, ear muffs, etc. and were in direct contact with the cement dust (case group or exposed group). A similar matched group of 54 non smoker mill workers which included clerical staff, administrative officers, storekeepers and officers who were not directly exposed to the cement dust were also selected as control group. The procedure for lung function test was demonstrated and explained to each individual included in the study and then was carried out using a Electronic Peak Flow Meter. In addition to anthropometric measurements, Force expiratory volume in first second (FEV<sub>1</sub>) and Peak expiratory flow rate (PEFR) were measured and compared between the two groups.

## RESULTS

All the individuals selected for the study were non smokers and were not taking any protective measures such as mask or any other stuff for prevention from the dust. Both the exposed and non exposed cement factory workers were compared for the anthropometric measurements such as weight, height, BMI, waist circumference, age and their duration of work. All of the parameters were found to be statistically insignificant on comparison between exposed and non exposed factory workers which shows that the

two groups were matched with each other as shown in table 1. When the pulmonary function parameters were compared between the two groups, it was found that PEFR was statistically insignificant while FEV<sub>1</sub> differed significantly between the two groups ( $p < 0.05$ ), as depicted in table 2. Therefore, this difference could be attributed due to the occupational dust exposure.

**Table No.1: Comparison of the two groups against various anthropometric variables and job experience**

Variables	Exposed (n=46) Mean (SD)	Non- Exposed (n=54) Mean (SD)	P- Value
Weight	75.8 ± 15.3	74.9 ± 12.7	0.75
Height	1.71 ± 0.20	1.69 ± 0.95	0.47
Body Mass Index	26.2 ± 6.17	26.1 ± 5.02	0.95
Waist circumference	36.4 ± 4.78	37.1 ± 3.68	0.37
Age	39.3 ± 9.81	42.1 ± 10.71	0.16
Experience	10.9 ± 8.27	12.1 ± 9.67	0.52

\*Significant value  $p = 0.05$

**Table No.2: PEFR and FEV<sub>1</sub> between the two groups:**

Variable	Exposed (n=46) Mean (SD)	Non- Exposed (n=54) Mean (SD)	P- Value
Peak Expiratory Flow (PEF) in ml	454.3 ± 156.1	456.4 ± 119.8	0.94
Force Expiratory Volume in First Second (FEV <sub>1</sub> ) in Liters	2.50 ± 0.94	2.14 ± 0.69	0.03*

\*Significant value  $p = < 0.05$

## DISCUSSION

The present study demonstrates a significant difference in the FEV<sub>1</sub> value between the exposed and unexposed group, which can be attributed to the occupational environment that affects the dynamic lung volume (FEV<sub>1</sub>). This is in consistent with other studies, in which it was demonstrated that there exists a significant difference in FEV<sub>1</sub> in workers who were in close contact with the dust exposure<sup>3,6</sup>. In addition to this, the change in the lung volume in cement workers has also been demonstrated in other studies conducted in different countries such as Nigeria, UAE, and Saudi Arabia<sup>7, 8, 9</sup>.

Omer A El Badri reported a reduction in the lung volume increased proportionately with the exposure to cement dust and demonstrated a significant reduction in the PEFR and FEV<sub>1</sub> when compared to unexposed group, which implies to the restrictive lung disease<sup>10</sup>. This is in contrast to the present study which shows PEFR to be statistically insignificant while FEV<sub>1</sub> remains significant between the two groups.

Inhalation of the air born dust results in the most important group of occupational disease, i.e. respiratory

tract disorder, of which chronic bronchitis often associated with emphysema has been the most frequently reported<sup>11</sup>. A Study conducted in Iran indicates that due to the chronic exposure to cement dust, there exists a general tendency for some of the pulmonary function parameters to diminish, thus, leading to a significant decrease in the some of these parameters such as VC, FVC, FEV1 and PEFR<sup>12</sup>. This is consistent with present study, although the reduction of PEFR was found to be insignificant while FEV1 remains significant between the exposed and non exposed cement workers. Diminished ventilator capacities due to occupational exposure to cement dust have also been reported with other studies<sup>9,13-15</sup>. A study conducted in the Norwegian cement factory workers demonstrated an insignificant reduction in the pulmonary functions and attributed this to the vigilant use of protective measures<sup>16</sup>. Such practices were also missing in our industries and the current study also showed the absence of the practical implementation of such preventive measures.

## CONCLUSION

Occupational cement dust exposure has been found to be associated with impaired pulmonary functions which may lead to chronic pulmonary diseases in future. This justifies the need to ensure that the workers take preventive measures by using protective gears and reducing the accumulation of dust in the environment in order to reduce the inhalation of dust particles. This would ensure safe working environment and may be helpful in preventing the occupational respiratory diseases which could decrease the financial burden not only on the people but also on the government.

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

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# Frequency of Recurrent Laryngeal Nerve Palsy after Thyroidectomy at Sheikh Khalifa Bin Zaid Hospital Rawlakot Azad Kashmir

1. Malik Asrar Ahmed 2. Amir Ahmed 3. Zia-ur-Rehman

1. Asstt. Prof. of Surgery, 2. 1. Asstt. Prof. of Orthopedic Surgery, 3. Prof. of Surgery and Principal, Poonch Medical College, Rawlakot, Azad Jammu & Kashmir

## ABSTRACT

**Objectives:** The objective of the study was to determine the frequency of post thyroidectomy RLN palsy and to adopt measures to reduce the frequency of RLN palsy after thyroidectomy.

**Study Design:** Descriptive study

**Place and Duration of Study:** This study was carried out at General Surgery Department, Sheikh Khalifa Bin Zaid Hospital Rawlakot Azad Kashmir from 16.11.2012 to 16.11.2014

**Materials and Methods:** Total of 80 patients of goiter undergoing thyroidectomy were admitted through outpatient department. All patients underwent thorough clinical examination and investigations. They were informed of the benefits and risks associated with surgery and written informed consent was obtained. All information was recorded on performa. Vocal cord status was assessed pre and postoperatively by indirect laryngoscopy. Size of thyroid gland was measured before operation in all the patients and weight of thyroid tissue removed during operation was also assessed. 03 patients were excluded from the study as they were already having hoarseness of voice. 29 were subjected to subtotal thyroidectomy, 30 to total thyroidectomy, and 21 to hemi-thyroidectomy randomly. All were followed up for RLN palsy for 03 months. According to our objective, no test of significance was applicable. However, descriptive statistics including mean, standard deviation was used by using Microsoft statistical package for social sciences "SPSS Version 10."

**Results:** The age range of the patients undergoing thyroidectomy was 20-68 years with an average age of 44. Total mortality rate was 0%. Transient hoarseness of voice was present in 01(1.2%) which improved spontaneously with time and permanent hoarseness in 0% patients. No patient was lost at any point.

**Conclusion:** Frequency of RLN palsy can be reduced by careful identification of recurrent laryngeal nerve by various methods per-operatively.

**Key Words:** Recurrent laryngeal nerve, Thyroidectomy, Frequency, laryngoscopy

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## INTRODUCTION

Patients with thyroid disease either present with a lump in the neck which is of thyroid origin (a goiter), hypothyroidism or symptoms and signs of hyperthyroidism (thyrotoxicosis). Damage to the recurrent laryngeal nerve (RLN) during thyroid or parathyroid surgery is the most common iatrogenic cause of vocal cord paralysis. Identification of the RLN and meticulous surgical technique can significantly decrease the incidence of this complication. Surgeons need to be aware of their position. Non-recurrent recurrent laryngeal nerve (NRRLN) is associated with a right subclavian artery arising from distal aortic arch. Awareness of their existence and correct surgical technique will prevent the surgeon from accidental lesion of NRRLN if it is encountered during thyroid or

parathyroid surgery<sup>1</sup>. RLN damage leads to a significant morbidity up to 20% depending upon the surgery performed. RLN damage also depends upon the size of thyroid gland and volume of thyroid tissue resected.<sup>2</sup> RLN palsy after thyroidectomy although infrequently encountered, can decrease quality of life. In addition to the hoarseness that occurs with unilateral RLN palsy, bilateral palsy leads to dyspnea and often to life-threatening glottal obstruction. Therefore, intraoperative awareness of the nerve's status is of great importance. All patients must be examined postoperatively by direct laryngoscopy or laryngofiberscopy to check vocal cord mobility. If we detect vocal cord palsy immediately after surgery, palsy often recovers within 1 year when visual preservation of RLN is successful.<sup>3</sup> Bilateral RLN paralysis after thyroidectomy is infrequent, but serious when it occurs. Intraoperative knowledge of the status of the nerve after dissection could potentially provide the surgeon with important decision-making information.<sup>4</sup> Patients without voice complaints can have vocal cord motion impairment. Patients can also have vocal cord motion

**Correspondence:** Dr. Malik Asrar Ahmed,  
Asstt. Prof. of Surgery, Poonch Medical College,  
Rawlakot, Azad Jammu & Kashmir.  
**Cell No.:** 03234004413  
**E-mail:** ajkdrasrar@yahoo.com

impairment contralateral to the thyroid lesion. Preoperative Vocal cord examination helps to counsel patients appropriately about the risks of surgery and helps outline a plan for the extent of surgery while minimizing the medico legal ramifications of iatrogenic RLN injury.<sup>5</sup> RLN palsy may lead to respiratory obstruction post-operatively for which intubation followed by tracheostomy may be required.<sup>6</sup>

Modifications of phonation occurring after total thyroidectomy (TT) are usually attributed to surgical malpractice, but other causes of voice impairment even in non operated subjects should also be taken into account.<sup>7</sup> RLN palsy should be detected before surgery for thyroid diseases with regard to the incidence of malignancy, histopathologic distribution, extrathyroidal invasion, management, and prognosis. Thyroid tumor associated with RLN palsy is strongly suggestive of malignancy. The RLN should be preserved if it has not been invaded by the tumor, because it offers a good chance of functional recovery postoperatively.<sup>8</sup> Operations for thyroid cancer, Graves' disease, and recurrent goiter demonstrated significantly higher RLN palsy rates. Postoperatively, the RLN recovered in most of the patients without documented nerve damage during the operation.<sup>9</sup> Injury to the RLN is a rare complication of initial thyroid and parathyroid surgery, but the prevalence is much higher in the reoperative setting. The use of continuous, intraoperative electromyographic monitoring of the RLN has been suggested to improve the safety of cervical explorations. Intraoperative electromyographic monitoring of the RLN in reoperative neck surgery can be performed safely but did not decrease RLN complications. Experience and routine nerve exposure remain crucial to the minimization of RLN complications.<sup>10</sup> Continuous laryngeal nerve integrity monitoring (NIM) during thyroidectomy is associated with a decreased risk of postoperative RLN injury.<sup>11</sup> Total lobectomy with routine RLN identification is recommended as a basic procedure in thyroid surgery.<sup>12</sup> Only identification of RLN and its careful exposure allow prevention of iatrogenic injuries. Damage to the RLN or to one of its branches may be avoided only by identification and careful exposure of the nerve itself. An experienced surgeon with good knowledge of the anatomy of the RLN and its anatomical variations is required for uncomplicated treatment of thyroid disease.<sup>13</sup> Great care is required following presumed identification of the RLN to ensure that there are no other unidentified branches.<sup>20</sup>

The permanent lesion of damaged RLN often manifests as an irreversible dysfunction of phonation and is seen following thyroid surgery. The frequency of this complication ranges from 0.5 to 5% in different thyroid surgery centers and increases in case of both recurrent goiter and complete thyroidectomy due to thyroid cancer. The RLN lesion varies from irreversible,

persistent and transient dysfunction with good prognosis of complete recovery. The time of RLN function recovery ranges from several weeks to two years (mainly 6 months)<sup>14</sup>. Vocal cord palsy often recovers within 1 year when visual preservation of RLN is successful.<sup>4</sup> Intraoperative neuromonitoring has been widely adopted to facilitate the identification and preservation of recurrent laryngeal nerve (RLN) function during thyroid surgery. There are pitfalls associated with the use of intraoperative neuromonitoring during thyroid surgery. Routine application is not recommended except for selected high risk patients<sup>15</sup>. This study was conducted to detect the overall rate of RLN palsy after thyroid surgery at SKBZ Hospital Rawlakot so that appropriate measures can be taken to reduce this rate.

## MATERIALS AND METHODS

The study was carried out at the Department of General Surgery Department Sheikh Khalifa Bin Zaid Hospital Rawlakot Azad Kashmir SKBZ hospital is a tertiary health care center from 16/11/2012 to 16/11/2014. Its catchment area are District Bagh, Poonch, Kotli and some other areas. At SKBZ hospital Rawlakot, General Surgeon deal with goiter and thyroidectomies are being performed. The hospital is providing twenty four hour emergency services. The hospital has well equipped laboratory facility as well.

A total of 80 patients of goiter undergoing thyroidectomy were selected for study of frequency of recurrent laryngeal nerve palsy after thyroidectomy. All these patients were admitted in surgical wards of SKBZ hospital Rawlakot. These patients were admitted through outpatients department (OPD) with symptoms.

**Sampling technique:** The technique used is convenience sampling (non-probability).

**Inclusion criteria:** All the patients undergoing thyroid surgery were included in the study. A total of 29 patients were there who underwent subtotal thyroidectomy for multinodular goiter. Those with thyroid malignancy undergoing total thyroidectomy were included. A total of 30 patients underwent total thyroidectomy. The patients with thyroid cyst undergoing hemithyroidectomy (lobectomy and isthmusectomy) were also included in the study. A total of 21 patients underwent hemithyroidectomy.

**Exclusion criteria:** Patients with thyroid malignancy already having RLN palsy. Already operated patients suffering from RLN palsy.

The patients who already had hoarseness of voice and previous thyroid surgery were excluded from the study. There were three patients who were excluded. Two were already operated and were having hoarseness of voice. First patient was operated in 1999 for thyroid cancer. She developed hoarseness of voice post-operatively. Got treatment from many centers for this hoarseness, but it was not cured. Now she presented

with recurrence and surgery was planned for her. Second patient was again an operated case of thyroid cancer. Operated in the year 2000. He was admitted for surgery because of recurrence. Third patient was a case of thyroid cancer and there was hoarseness of voice. Indirect laryngoscopy was done and vocal cord paresis on right side was found.

**Ethical Considerations:** The study was carried out after formal approval from ethical committee of the hospital.

**Data collection procedure:** In the study, variables included were age and gender. The initial diagnosis of goiter was made on the basis of history, clinical examination and investigations (Ultrasonography and ct-scan). The management of the patients was planned after the patients were thoroughly evaluated and investigated. During surgery, the thyroid lobes were drawn forward and medially, and search for inferior thyroid artery and RLN was made. Scalpel was used in view of possible injury to trachea or to RLN. When both thyroid arteries had been ligated there was surprisingly little bleeding from the flat cut surface of the gland, and haemostasis was achieved by ligatures. Post-operative laryngoscopy of the patients was done. Hoarseness of voice and its duration, vocal cord status was noted. Patients were assessed for all the complications including recurrent RLN for transient and permanent hoarseness of voice for six months. Study perma included demographic data, presenting complaints, associated diseases during and procedure done. Transient and permanent hoarseness of voice was recorded.

**Data analysis:** At the end of study period, all the entered values were analyzed and the results were seen. According to our objective, no test of significance was applicable. However, descriptive statistics including mean, standard deviation was used by using Microsoft statistical package for social sciences "SPSS Version 10."

## RESULTS

In this study, a total of 80 patients were studied who underwent thyroid surgery. There was alteration of voice in 01(1.2%) patient. It was transient. It depended upon the experience of the operating surgeon, type of thyroid disease and size of thyroid gland and weight of thyroid tissue removed. In all the cases, RLN was searched. Three patients were excluded from the study as they were already having hoarseness of voice. One was previously operated for follicular carcinoma of the thyroid and rest of the two were having carcinoma of thyroid. No patient was dropped out or lost at any point. According to our objective, no test of significance was applicable. However, descriptive statistics including mean, standard deviation and proportion was used by using "SPSS Version 10." The age range of the patients was 30 to 60 years with a mean of 45 years, median 44

years and mode 46 years undergoing subtotal thyroidectomy. For hemithyroidectomy age range was 39 to 52 years and mean age was 45.5 years, median 43 years and mode 39 and 41 years. For total thyroidectomy mean age was 33 to 41 years and mean age was 37 years, median 36 years and mode 33 years. Transient palsy of recurrent laryngeal nerve was present in one patient (1.2%) and permanent palsy was in no patient (0%).

**Table No.1: Age of Patients Undergoing Thyroidectomy (N=80)**

Mean	40.6750
Std. Deviation	6.3181
Range	26.00
Minimum	31.00
Maximum	57.00

**Table No.2: Gender of Patients Undergoing Thyroidectomy (N=80)**

Gender	Number	%	Valid %	Cumulative %
Male	48	60.0	60.0	60.0
Female	32	40.0	40.0	100.0
Total	80	100.0	100.0	

**Table No.3: Diagnosis of Patients Undergoing Thyroidectomy (N=80)**

	Number	%	Valid %	Cumulative %
Multi Nodular Goiter	28	35.0	35.0	35.0
Thyroid Cyst	22	27.5	27.5	62.5
Follicular CA Thyroid	1	1.3	1.3	63.8
Papillary CA Thyroid	1	1.3	1.3	65.0
Thyroid CA	28	35.0	35.0	100.0
Total	80	100.0	100.0	

**Table No.4: Post Thyroidectomy Clinical Findings and Indirect Laryngoscopy (IDL) (N=80)**

	Number	%	P - value
Hoarseness of Voice	1	1.25	0.218
Laryngeal Nerve Palsy	1	1.25	0.218

p-value <0.05 is considered statistically significant

## DISCUSSION

There are various studies carried out to determine the frequency of RLN palsy after thyroidectomy. There are various types of thyroidectomies depending upon the type of the disease. In multinodular goiters subtotal thyroidectomy, in case of thyroid cyst of solitary thyroid nodule hemithyroidectomy (lobectomy and isthmusectomy) and in case of carcinoma of thyroid usually total thyroidectomy is performed depending upon the lesion and requirement.<sup>16</sup> Our study was carried out to determine the frequency of RLN palsy after various types of thyroidectomies at SKBZ hospital Rawlakot.

Post-operative recurrent laryngeal nerve palsy was present in 1(1.2%) of the patients. There was temporary hoarseness of voice. Patient was followed up and it was settled later on. A similar study was conducted by Muhammad Arif at Liaquat Medical College Hospital (LMCH). He studied 170 patients who underwent thyroidectomy. In his study, out of 170 patients who underwent thyroidectomy, alteration of voice suggestive of RLN palsy was there in 16 patients. There was transient nerve palsy in 4.7% and permanent was also in 4.7%<sup>2</sup>.

In our study, we assessed the vocal cord status in the patients pre and post-operatively by indirect laryngoscopy as described by Tomoda C, et al.<sup>3</sup>

RLN was identified per-operatively and proper measures were taken to avoid any injury to the nerve. Damage to the recurrent laryngeal nerve (RLN) during thyroid surgery is the most common iatrogenic cause of vocal cord paralysis. Identification of the RLN and meticulous surgical technique can significantly decrease the incidence of this complication.<sup>1</sup> So, if we detect vocal cord palsy immediately after surgery, vocal cord palsy often recovers when visual preservation of RLN is successful.<sup>3</sup>

Post-operative recovery from anaesthesia was smooth in all the patients in my study. While according to the study conducted by Jamil M, RLN palsy may lead to respiratory obstruction post-operatively for which intubation followed by tracheostomy was required.<sup>6</sup> RLN palsy should be detected before surgery for thyroid diseases with regard to the incidence of malignancy, histopathologic distribution, extrathyroidal invasion, management, and prognosis.<sup>9</sup> Those patients having hoarseness of voice before surgery were excluded from our study. According to Jamski J study, permanent lesion of damaged RLN often manifests as an irreversible dysfunction of phonation. Frequency of this complication ranges from 0.2 to 5% in different thyroid surgery centers and increases in case of both recurrent goiter and complete thyroidectomy due to thyroid cancer.<sup>14</sup> While no patient was found to have a permanent RLN palsy in our study.

In a study done by Miyauchi A in 2007, to avoid RLN palsy the technique of lateral mobilization of the nerve was adopted as in case of thyroid cancer, RLN may invade the trachea which fixes the thyroid to trachea.<sup>17</sup> This technique of lateral mobilization of RLN was adopted in many of the case with thyroid cancer in our study.

In the study done by Shindo, the incidence of postoperative vocal cord paresis or paralysis in patients who underwent thyroidectomy with and without continuous RLN monitoring was compared. It was found that the difference was not statistically significant.<sup>18</sup> In our study, we monitored the RLN continuously to avoid partial or complete injury. In his study, Li Lx, he found 5 cases who underwent thyroid surgery with non recurrent

laryngeal nerve(NRLN).2 patients were found to have vocal cord paralysis and 1 case recovered in 3 cases who had NRLN injury<sup>19</sup>. In our study, RLN was identified in all the patients and no patient was found to have NRLN.

## CONCLUSION

With proper measures frequency of RLN damage during thyroidectomy can be reduced. Pre-operative indirect laryngoscopy should be done to assess the vocal cord status to see that the nerve involvement is already there or not. An expert Surgeon only should perform thyroid surgery to reduce the frequency of this complication and if some beginner, it should be under proper supervision. Before starting the surgery, anaesthetist should do an indirect laryngoscopy to assess the vocal cord status. Proper per-operative monitoring and identification of the nerve is mandatory. Immediately after removal of endotracheal tube (extubation), vocal cords should be assessed by indirect laryngoscopy. Patients should be monitored post-operatively for hoarseness of voice. With all these measures, frequency of RLN palsy can be decreased.

**Recommendations:** Damage to RLN can be avoided by proper intraoperative neuromonitoring. Electrode-embedded endotracheal tubes allow continuous intraoperative assessment of vocal cord function when connected to an electro-myographic (EMG) response monitor. Proper identification of the nerve and its course is important. Approaching the nerve along its distal portion is safe and effective. Thorough airway check pre-operatively is advisable in all patients. Visual nerve identification is the gold standard.

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

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