THE INCIDENCE OF FROZEN SHOULDER IN DIABETES MELLITUS

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ABSTRACT

Introduction: Frozen shoulder medically referred to as adhesive capsulitis, is a disorder in which the shoulder capsule, the connective tissue surrounding the glenohumeral joint of the shoulder, becomes inflamed and stiff. Movements of the shoulder are severely restricted, especially abduction and external rotation with progressive loss of both active and passive range of motion. Muscular and skeletal problems occur among people with long-standing, poorly controlled diabetes. Sometimes the problems are very painful like frozen shoulder. One theory about frozen shoulder in diabetes says that glucose (sugar) molecules get attach to collagen and this abnormal deposits of collagen in the cartilage and tendons of the shoulder causes the affected shoulder to stiffen up. **Objectives:** The objective of study was to determine the frequency of frozen shoulder in diabetic patients. **Study Design:** Observational study was conducted and the data was collected from Diabetic patients who came to diabetic center. Setting: The study was conducted at the Diabetic clinic of Lahore Jinnah Hospital. **Period:** 3 months after the approval of synopsis. **Material and Methods:** A set of questions was developed with the help of supervisor, senior teachers, books and doctors to get information from diabetic patient. Variables included in questionnaire were Age, Gender, Socio-economic status, History of diabetics and other variables according to frozen shoulder. The data was collected from 50 patients by direct personal approach method. Data was collected from both male and female patients. **Result:** Result showed that thirteen out of fifty diabetic patients were having frozen shoulder. When gender ratio was analyzed from collected data, it showed that females were more victim of frozen shoulder than male with frequency of 8 and 5 respectively. Right hand was seem to be more involved than left. Right hand was 61.5% involved and left hand was 38.5% involved. Nature of pain was seen more localized with 69.2% and radiating with 30.8%. Among thirteen, nine patients were having were having sleep disturbance. **Conclusion:** Only thirteen diabetic patients were suffering from frozen shoulder. This shows that incidence of Frozen Shoulder was not very high in diabetic patients.

Key words: Frozen shoulder, Diabetes Mellitus, Musculoskeletal problems

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INTRODUCTION

Frozen shoulder medically referred to as adhesive capsulitis, is a disorder in which the shoulder capsule, the connective tissue surrounding the glenohumeral joint of the shoulder, becomes inflamed and stiff. Movements of the shoulder are severely restricted, especially abduction and external rotation with progressive loss of both active and passive range of motion.

On the basis of etiology frozen shoulder can be divided into two types, Primary frozen shoulder and Secondary frozen shoulder.

Primary frozen shoulder is idiopathic no specific cause is present. The facts about idiopathic frozen shoulder are as follow it happens mostly to people aged in their 50's, 60's and 70's, women get it much more commonly than men, it can sometimes affect both shoulders at once - or one after the other.

Secondary frozen shoulder may be associated with different diseases like tendinitis / bursitis, rotator cuff injury, diabetes, chronic inflammatory arthritis of the shoulder, stroke, thyroid problem, accidents, lung disease, connective tissue disorders, heart disease.

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Muscular and skeletal problems occur among people with long-standing, poorly controlled diabetes. Sometimes the problems are very painful like frozen shoulder. One theory about frozen shoulder in diabetes says that glucose (sugar) molecules get attach to collagen and this abnormal deposits of collagen in the cartilage and tendons of the shoulder causes the affected shoulder to stiffen up.

Adhesive capsulitis affects about 5% of the general population, but it affects nearly 20% of people with diabetes. What factor actually causes the disorder is unclear but patients with type 1 and type 2 diabetes are at higher than average risk for developing it. Age and duration of the disease can push that risk even higher.[8]

Collagen fibers normally slide along one another during muscular movement. In glycosylation, they become glued together by glucose. This process can also occur in the skin, which becomes hard and tough (diabetic scleredema).

According to the National Institutes of Health (NIH), people with diabetes have an increased risk of developing adhesive capsulitis. The estimated prevalence is 11-30% in damaging the connective tissue which makes up the joints. Adhesive capsulitis is associated with the duration of diabetes and age. It is usually more severe in the dominant shoulder.

LITERATURE REVIEW
Ray**,** Datta**,** Sinhamahapatra**,** Ray**,** Mukhopadhyay and Dasgupta (2011) conducted a care centrebased cross-sectional study among 100 consecutive diabetic patients (WHO criteria) attending medicine department. The study was done at Calcutta National Medical College and Hospital, Kolkata, from March 2008 to February 2009. The diagnoses of the rheumatic conditions were made by unbiased clinical observations on the basis of standardized case definitions or criteria. Limited joint mobility (29%), adhesive capsulitis (18%), and osteoarthritis of knee (27%) or hand (17%) were the most common rheumatic conditions in those patients.

Garcilazo, Cavallasca and Musuruana (2010) researched that shoulder is one of the frequently affected sites in diabetic patients. One of the rheumatic conditions caused by diabetes is frozen shoulder (adhesive capsulitis), which is characterized by pain and severe limited active and passive range of motion of the glenohumeral joint, particularly external rotation. This disorder has a clinical diagnosis and the treatment is based on physiotherapy, NSAIDs, corticosteroid injections and surgical resolution.

Balci, Balci and Tuzuner (1999) had studied the association between shoulder adhesive capsulitis and chronic diabetic complications and diseases closely related to diabetes in Akdeniz University Hospital. Shoulder adhesive capsulitis were evaluated in 297 consecutive type II diabetic patients attending an outpatient diabetic clinic. Shoulder adhesive capsulitis was detected in 86 patients (29%). Also, shoulder adhesive capsulitis was associated with the age of patients ($p = 0.000$) and the duration of diabetes ($p = 0.03$).

The degrees of passive abduction, internal rotation, external rotation motions of shoulder joints in the all patients were correlated with age of patients, duration of diabetes, neuropathy, and the other hands' problems (Dupuytren's disease, limited joint mobility) ($p < 0.05$). Arkkila**,** Kantola**,** Viikari**,** Rönnemaa and Ann (1996) done a cross sectional study in 291 type I [mean (SD) age 33.2 (9.9) years] and 134 type II [61.1 (12.4) years] diabetic patients at Department of Medicine, Turku University Central Hospital, Finland. The presence of shoulder capsulitis, Dupuytren disease, and limited joint mobility was sought. Prevalence of shoulder capsulitis was 10.3% in type I and 22.4% in type II diabetic sub-jects. Shoulder capsulitis was associated with the age in types I ($P < 0.01$) and II ($P < 0.05$) diabetic patients and with the duration of diabetes in type I patients ($P < 0.01$).

MATERIAL AND METHOD
STUDY DESIGN
Observational study was conducted and the data was collected from Diabetic patients who came to

diabetic center.

SETTING
The study was conducted at the Diabetic clinic of Lahore Jinnah Hospital.

DURATION OF STUDY
3 months after the approval of synopsis.

SAMPLE SIZE
Sample of 50 patients were taken for data collection.

SAMPLE SELECTION
Inclusion criteria:
- Age 30-60
- Diabetic patient
- male and female

Exclusion criteria:
- All those people who were not fit in above group.

SAMPLING TECHNIQUE
- Direct personal interview method.
- Mailed questionnaire method.
- Telecommunication& electronic media method.

DATA COLLECTION
Following steps were adopted to collect the data,
- With the help of research supervisor and senior teachers a questionnaire was developed.
- Before visiting the specific department researcher got permission from concerned authorities.
- The data was collected from 50 patients by direct personal approach method.
- Data was collected from both male and female patients.

DATA ANALYSIS
Tools and Statistics:
Using SPSS v.16 the data was managed and analyzed. The continuous variables were expressed as mean S.D. where as categorical variable was expressed in the form of frequency table and percentages. Appropriate graphs were used to display the data.

RESULT

Mean of Height and Weight		
	Mean	Std. Deviation
Height	5.642	±.4156
Weight	69.680	±7.0202

When mean and standard deviation of height and weight was taken the result were
Height   5.642±.4156
Weight   69.680±7.0202

Frozen Shoulder Frequency		
	Frequency	Percent
Height	13	26.0
Weight	37	74.0

Table.2 shows that out of fifty patients there were thirteen such patients who have frozen shoulder issue with least 26.0 percentage.

GRAPH I:
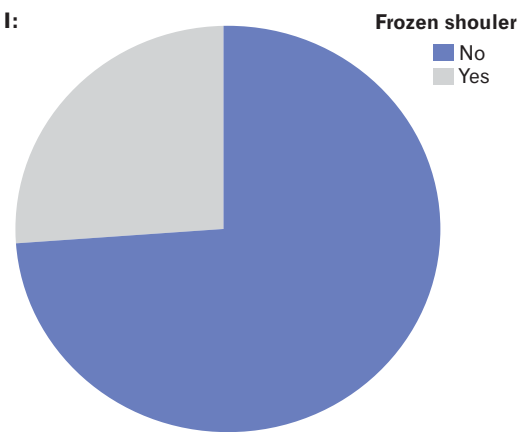

Frozen shouler
- No
- Yes

Figure 4.1 Pie of FS

Pie chart shows that only fewer of diabetics do have frozen shoulder while others do not suffer from this phase.

Gender Ratio		
Gender	Frequency	Percent
Male	5	38.5
Female	8	61.5

GRAPH II: **Gender**
                                                                 ■ Male
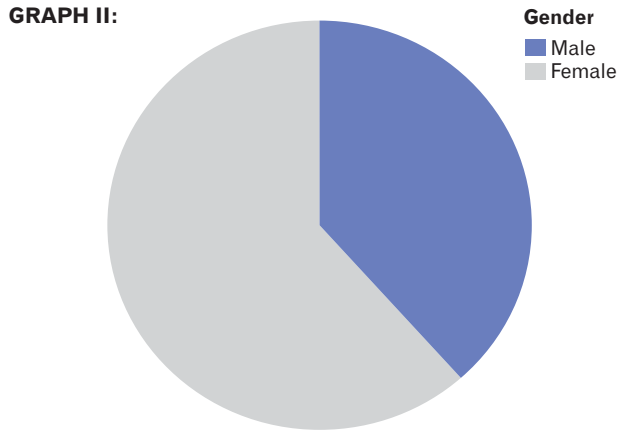   ■ Female

Figure 4.2 Pie of gender ratio

This pie shows that frozen shoulder in diabetics is more in Females than Males with 61.5% and 38.5% respectively.

Frequency of side of involvement

Side of Involvement	Frequency	Percent
Right	8	61.5
Left	5	38.5

GRAPH III: **Side of Involvement**
                                                         ■ Right
                                                         ■ Left

Figure 4.3 Pie of side of involvement

Table and figure shows that right side shoulder is more involved than left side shoulder with 61.5 and 38.5 percent respectively.

Frequency of nature of pain

Nature of Pain	Frequency	Percent
Localized	9	69.2
Radiating	4	30.8

GRAPH IV: **Nature of Pain**
                                                                ■ Localized
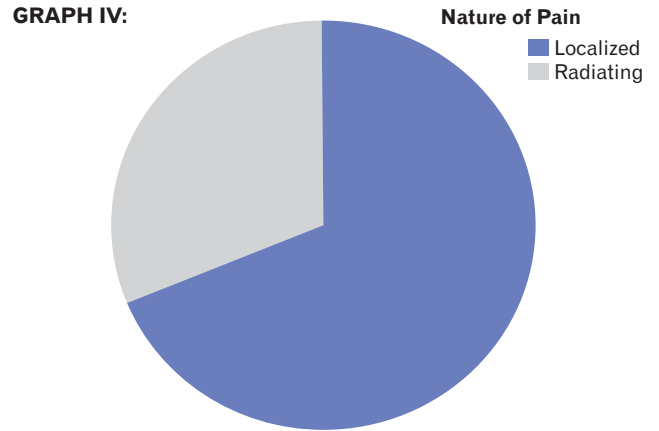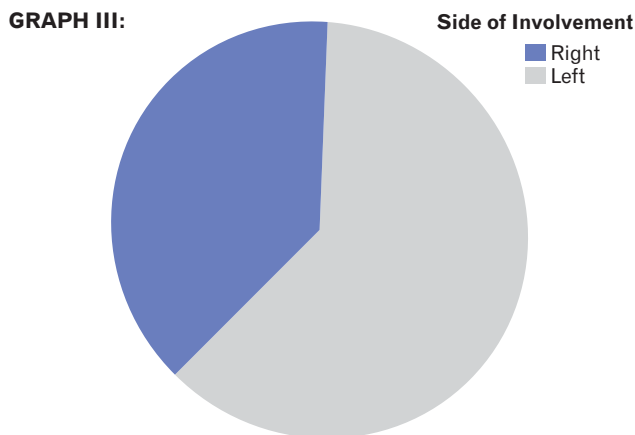   ■ Radiating

Figure 4.4 Pie of nature of pain

It shows that the pain in most cases is localized than radiating with 69.2 and 30.8 percent out of collected data sample.

Frequency of sleep disturbance

Presence of Sleep Disturbance	Frequency	Percent
Yes	9	69.2
No	4	30.8

GRAPH V: **Presence of Sleep Disturbance**
                                                          ■ Yes
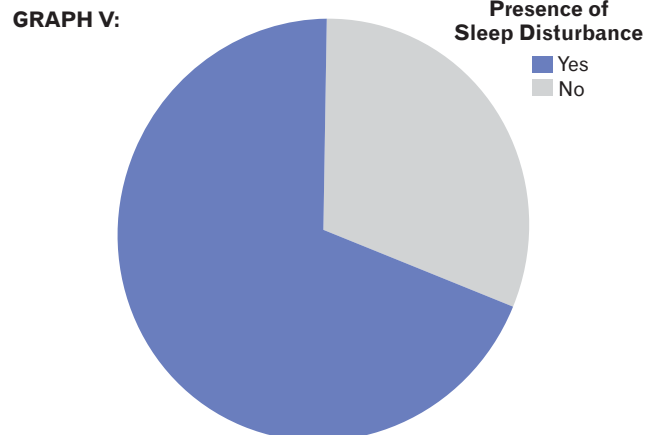   ■ No

Figure 4.5 Pie of sleep disturbance

Due to frozen shoulder pain patients get disturbed and consequences are more sleep disturbance with 69.2 percent

Familial history of diabetes Frozen shoulder

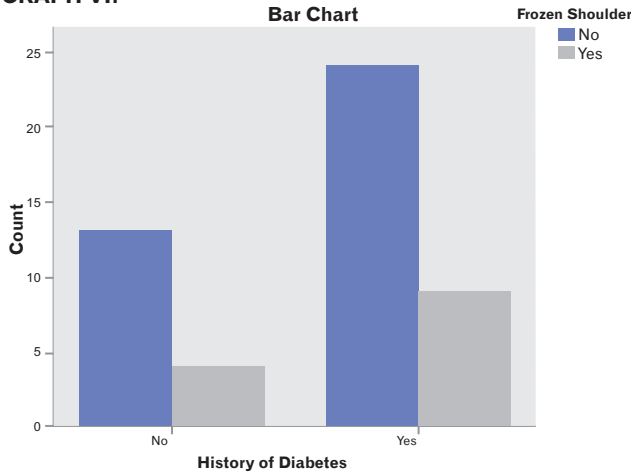| | Frozen Shoulder | | |
	No	Yes	Total
History Of Diabetes No	13	4	17
Yes	24	9	33
Total	**37**	**13**	**50**

GRAPH VI:

Figure 4.6 Bar chart of familial history and frozen shoulder

Statistical analyses shows that patients with familial history of diabetes were more prone to have frozen shoulder.

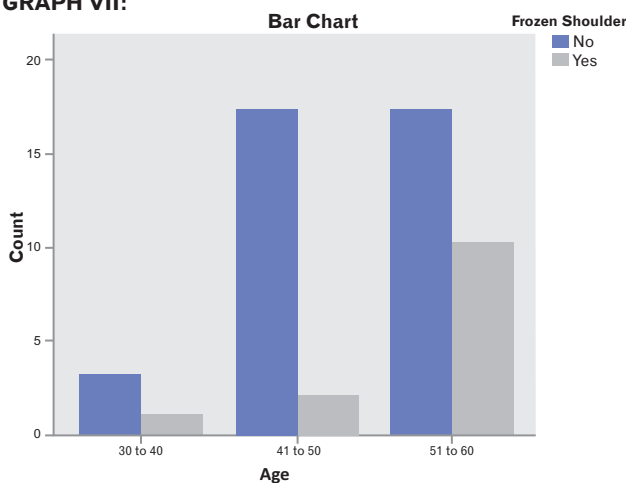| Age classes. frozen shoulder			
Age	Frozen Shoulder		Total
	No	Yes	
30 to 40	3	1	4
41 to 50	17	2	19
51 to 60	17	10	27
Total	**37**	**13**	**50**

GRAPH VII:

Figure 4.7 Bar chart of Age classis

Table and figure shows statistically that frozen shoulder increases with the age in diabetic mellitus patients.

DISCUSSION

Diabetes is a clinical syndrome characterized by hyperglycemia due to absolute or relative deficiency of insulin. Long standing metabolic disarrangement is associated with permanent functional and structural changes in cells of body. Those of vascular system being particular susceptible. While frozen shoulder is condition characterized by stiffness and pain in shoulder leading to restricted active and passive range of motion.

Diabetes is a risk factor of frozen shoulder because there may be abnormal deposition of collagen in cartilage and tendon of shoulder joint. Glucose molecule may get attach to cell and destroy connective tissue structure.

My objective of study was to determine the frequency of frozen shoulder in diabetic patients.

A lot of researches have already been done on this which helped me out for my research work. I took the data of fifty patients and evaluated different variables to justify the topic of research.

Firstly I found the frequency of frozen shoulder patient among collected data and came to conclusion that thirteen patients out of fifty were having this. It shows that 26% were suffering from it which is almost approximate with studies of other researchers like Nilufr balci, Mustafa kamal balci in may 1999 studied that Frozen Shoulder was present in 29% patients.

CONCLUSION

Only thirteen diabetic patients were suffering from frozen shoulder. This shows that incidence of frozen shoulder is not very high in diabetic patients.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Masooma Gull	Data collection, Data analysis and writing	