ECRONICON OPEN ACCESS

EC ORTHOPAEDICS
Research Article

Prevalence of Frozen Shoulder in Chronic Diabetic Patients

Fiza Komal[1], Sana Tauqeer[2]*, Hammad Shakeel[3], Naveed Anwar[4], Sidra Saleem[5] and Kehkshan Khalid[6]

[1]*University Institute of Physical Therapy, Lahore, Pakistan*

[2]*Consultant Physiotherapist, Riphah International University, Lahore, Pakistan*

[3]*Physiotherapist, University Institute of Physical Therapy, Lahore, Pakistan*

[4]*Assistant Professor, Riphah International University, Lahore, Pakistan*

[5]*Riphah International University, Lahore, Pakistan*

[6]*Lecturer, Riphah International University, Lahore, Pakistan*

***Corresponding Author:** Sana Tauqeer, Consultant Physiotherapist, Riphah International University, Lahore, Pakistan.

Received: June 20, 2020; **Published:** August 29, 2020

Abstract

Aim: This research was conducted to find out the prevalence of frozen shoulder among chronic diabetic patients.

Methodology: This study was conducted in Kanaan Physiotherapy and Spine, Lahore, Pakistan. It was a cross sectional study. 155 patients were randomly selected. Patient's detail history was taken including age, gender, duration and any other history of joint disease, trauma and pain during movement. Patient was then taken through the scratch test for diagnosis of frozen shoulder. Patient was instructed to touch medial side of scapula of opposite shoulder, then to touch the upper back by placing the arm overhead, then place the arm on lower side of the back and try to reach upward.

Results: Prevalence of frozen shoulder in diabetic patients was 31.6%.

Conclusion: Frozen Shoulder was found to be a common problem in Diabetic Mellitus.

Keywords: *Frozen Shoulder; Diabetes Mellitus; Prevalence; Shoulder Joint; Peri-Arthritis*

Introduction

Frozen shoulder is a painful condition that usually leads to shoulder restricted range of motion (ROM). This condition is known as peri-arthritis which was introduced by Duplay in 1872. Frozen shoulder was introduced by Codman in 1934 which required careful diagnosis and management. Frozen shoulder is a condition that is associated with stiffness and disability of patient to sleep on the affected side. Patient has marked reduction in forward elevation and external rotation. Naviser called this condition as adhesive capsulitis in1945 which is not associated with capsular adhesions. It consists of inflammation of synovium and capsular contracture [1]. Frozen shoulder (FS) has three stages; firstly, the freezing stage in which there is a-traumatic history of patient with constant pain at night and stiffness of shoulder. It lasts for 10 to 36 weeks. In the second stage, the adhesive stage there is stiffness of shoulder and pain which is only present at the end of range of motion. Glenohumeral movements are extremely reduced with complete loss of external rotation. This stage lasts for 4 to 12 months. Resolution stage is the third stage in which there is sudden improvement in range of movement and usually takes 12 to 42 months. Increased prevalence of frozen shoulder in diabetic patients is much more common than in non-diabetic patients [2]. Incidence

of frozen shoulder in general population is 20% of diabetic patients and 3% to 5% in general population. FS is common between the ages of 40 to 60. FS is more common in women as compared to men. There is 10% - 20% chances of diabetic patients for having risk of frozen shoulder [3,4]. Prevalence of frozen shoulder in diabetic patients had been reported to be 10% to 22% and in general population 2% to 4% [5]. In a study conducted by Javad Kiani., *et al.* adhesive capsulitis is a musculoskeletal disorder with 8.79% among other disorders like carpal tunnel syndrome (CTS) and trigger finger. Risk factors for adhesive capsulitis are advanced age, female gender, duration of diabetes and smoking [6]. Ramcharn., *et al*. elaborated in a study that upper limb musculoskeletal disorders were directly related with poor glycemic control in diabetic patients and can worsen the condition [7]. Research study conducted by Tariq Ahmad Bhat., *et al*. in 2016 on Kashmiri population concluded that 61 (15%) out of 403 diabetic patients had shoulder disorders [8]. In another study of Zreik., *et al*. in 2016 reported that patients with frozen shoulder should be evaluated for the history of diabetes mellitus [9]. Hyperglycemia also begins the inflammatory process in synovium that leads to capsular fibrosis. This disease is a combination of inflammation and synovitis which results in micro-vascular complications which ends in capsular fibrosis. Complications related to diabetes are upper extremity disorders, infection and plantar ulcers. FS is one of the upper extremity disorders. Some other upper extremity conditions associated with diabetes are trigger finger, dupuytren disease and carpal tunnel syndrome [1,2,10,11]. Risk factors of adhesive capsulitis are advanced age, female gender, duration of diabetes and smoking. Upper limb muculo-skeletal disorders are directly related with poor glycemic control in diabetic patients and can worsen the condition. Clinical features of frozen shoulder include stiff and tender shoulder joint along with atrophy of rotator-cuff muscles. Patient positions his/her arm in internal rotation and adduction. Restriction of anterior superior capsule results in restriction of external rotation in adducted shoulder. Restriction of anterior inferior capsule results in restriction of external rotation in abducted shoulder. Advanced stages of FS results in reduction of internal rotation due to restriction of posterior capsular pattern [6,7]. Musculoskeletal disorders are common problems among diabetic patients due to the involvement of lower motor neuron, peripheral nervous system which provokes sensory symptoms and autonomic symptoms which can lead to severe neuropathies [12]. Patients with frozen shoulder have thickened coraco-humeral ligament and joint capsule. Diagnosis of frozen shoulder is made by subjective history, physical examination and MRI [13-15]. Exercise plays a vital role in dealing with the complications of diabetes including strength, flexibility and aerobic exercises [16].

Aim of Study

The main objective of this study was to find out the frequency of frozen shoulder among chronic diabetic patients.

Materials and Methods

The study design of this research was cross-sectional. Sampling technique was Non-probability convenient sampling. This study was conducted in Kanaan Physiotherapy and Spine, Lahore, Pakistan.

Method of sample selection

155 Diabetic patients were selected from Kanaan Physiotherapy and Spine, Lahore, Pakistan.

Patients' detail history was taken including age, gender, duration and any other history of joint disease, trauma and pain during movement. Patients were taken through the scratch test for diagnosis of frozen shoulder then instructed to touch medial side of scapula of opposite shoulder, then to touch the upper back by placing the arm overhead, then place the arm on the lower side of the back and try to reach upward. Inclusion criteria included diabetic patients of either gender (Male, Female). Exclusion criteria were those patients having shoulder injury (fractures, shoulder dislocation) and patients of malignancy and stroke. Sample size was conducted through this formula:

$$n = \frac{Z^2 p(1-p)}{d^2}$$

Figure 1: *Scratch test for assessment of shoulder joint range of motion.*

Results

According to the study results, there were total 49 (31.6%) respondents had frozen shoulder.

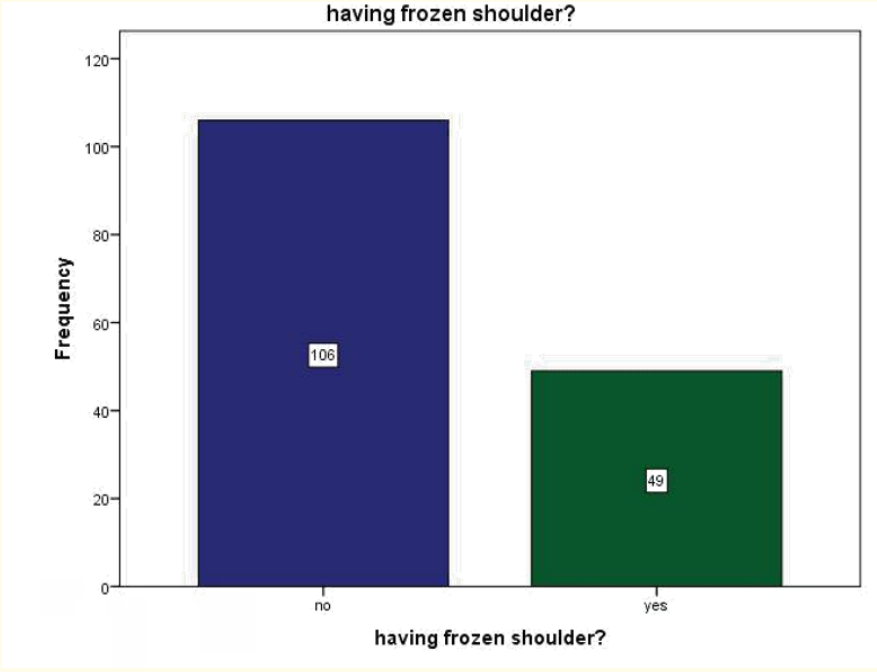

Figure 2: *Prevalence of frozen shoulder in diabetic patients.*

Have frozen shoulder	Frequency	Percent
No	106	68.4
Yes	49	31.6
Total	155	100.0

Table 1: *Have frozen shoulder in diabetic patients.*

Discussion

According to a study conducted by Ramchurn., *et al.* in which 96 people with diabetes were taken under observation. The results of the study showed that 75% among selected diabetic people had shoulder disorders like shoulder capsulitis, carpal tunnel syndrome, teno-synovitis and limited joint mobility. The prevalence of adhesive capsulitis in that study was 25%. The mean Hba1c level in those patients was also high. Poor glycemic control is a major cause for shoulder disorders which may also complicate the healing process [7,17]. According to current study there were 155 diabetic patients under observation. Results of the study showed that 31.6% of them had frozen shoulder.

Another study conducted by Krishnamurthy., *et al. stated* that among 400 Indian diabetic patients there was 18% of them had frozen shoulder. Study conducted by Huang., *et al.* in 2013 stated that, diabetes could be a major risk factor for frozen shoulder and had significant relationship with frozen shoulder [11]. Research conducted by Juel., *et al.* in 2017 elaborated that prevalence of frozen shoulder in diabetes was 59%. Shoulder disability is present more often in diabetic patients than in non-diabetic patients. Level of HbA1c is directly related to the shoulder disability [18].

In another study Rinco., *et al.* reported that frozen shoulder was a complication, which had incidence level of 11% postoperative of shoulder surgery [19]. In a study conducted by Tariq Ahmad Bhat., *et al.* in 2016 on Kashmiri population concluded that, 61 (15%) out of 403 diabetic patients had shoulder disorders. Musculoskeletal was a common problem in Kashmiri population [8]. In this recent study there were 49 (31.6%) out of 155 diabetic patients had frozen shoulder.

Conclusion

Diabetes mellitus is one of a serious metabolic condition which may have various issues such as upper extremity disorders. Frozen shoulder was found to be prevalent among diabetic patients.

Bibliography

1. Dias R., *et al.* "Frozen shoulder". *British Medical Journal* 331.7530 (2005): 1453-1456.
2. Gehling DJ and Ebraheim NA. "Diabetes-Related Conditions and Complications in Orthopaedic Surgery". *Diabetic Bone Disease* (2016): 71-93.
3. Nagy MT., *et al.* "The Frozen Shoulder: Myths and Realities". *The Open Orthopaedics Journal* 7.3 (2013): 352.
4. Uppal HS., *et al.* "Frozen shoulder: A systematic review of therapeutic options". *World Journal of Orthopedics* 6.2 (2015): 263.
5. Safran O., *et al.* "Should Patients With Frozen Shoulder Be Screened for Diabetes Mellitus?" *Orthopaedic Journal of Sports Medicine* 5.7 (2017): 2325967117716450.
6. Kiani J., *et al.* "Prevalence and risk factors of five most common upper extremity disorders in diabetics". *Journal of Research in Health Sciences* 14.1 (2014): 93-96.

7. Ramchurn N., *et al.* "Upper limb musculoskeletal abnormalities and poor metabolic control in diabetes". *European Journal of Internal Medicine* 20.7 (2009): 7718-7721.

8. Bhat TA., *et al.* "The musculoskeletal manifestations of type 2 diabetes mellitus in a Kashmiri population". *International Journal of Health Sciences* 10.1 (2016): 57.

9. Zreik NH., *et al.* "Adhesive capsulitis of the shoulder and diabetes: a meta-analysis of prevalence". *Muscles, Ligaments and Tendons Journal* 6.1 (2016): 26.

10. Garcilazo C., *et al.* "Shoulder manifestations of diabetes mellitus". *Current Diabetes Reviews* 6.5 (2010): 334-340.

11. Huang YP., *et al.* "Association of diabetes mellitus with the risk of developing adhesive capsulitis of the shoulder: a longitudinal population-based followup study". *Arthritis Care and Research* 65.7 (2013): 1197-1202.

12. Kotlęga D., *et al.* "Simultaneous acute shoulder arthritis and multiple mononeuropathy in a newly diagnosed type 2 diabetes patient–First case report". *Neurologia i Neurochirurgia Polska* 50.6 (2016): 474-480.

13. Mengiardi B., *et al.* "Frozen shoulder: MR arthrographic findings". *Radiology* 233.2 (2004): 486-492.

14. Li J-q., *et al.* "MRI findings for frozen shoulder evaluation: is the thickness of the coracohumeral ligament a valuable diagnostic tool?" *PLoS One* 6.12 (2011).

15. Chiaia TA and Hannafin JA. "Adhesive capsulitis". *Techniques in Shoulder and Elbow Surgery* 15.1 (2014): 2-7.

16. Rees J., *et al.* "Rehabilitation of tendon problems in patients with diabetes mellitus". *Metabolic Influences on Risk for Tendon Disorders* (2016): 199-208.

17. Bedi A., *et al.* "Diabetes mellitus impairs tendon-bone healing after rotator cuff repair". *Journal of Shoulder and Elbow Surgery* 19.7 (2010): 978-988.

18. Juel NG., *et al.* "Very high prevalence of frozen shoulder in patients with type 1 diabetes of≥ 45 years' duration: the Dialong Shoulder Study". *Archives of Physical Medicine and Rehabilitation* 98.8 (2017): 1551-1559.

19. Koorevaar RC., *et al.* "Incidence and prognostic factors for postoperative frozen shoulder after shoulder surgery: a prospective cohort study". *Archives of Orthopaedic and Trauma Surgery* 137.3 (2017): 293-301.

Volume 11 Issue 9 September 2020