

## Research Article

# Prevalance of Frozen Shoulder in Diabetic Patients (40-60 Year)

Moazma A<sup>1</sup> and Bhutta AH<sup>2\*</sup><sup>1</sup>BBH Hospital Rawalpindi Medical University  
Rawalpindi, Punjab, Pakistan<sup>2</sup>Lecturer, Riphah International University, Islamabad,  
Pakistan**\*Corresponding author:** Abdul Haseeb Bhutta,  
Lecturer, Riphah International University, Islamabad,  
Pakistan**Received:** August 09, 2018; **Accepted:** September 11,  
2018; **Published:** September 18, 2018**Abstract**

**Background:** A study done in Pakistan shows that frequency of shoulder adhesive capsulitis was 24.9% among diabetic subjects. Adhesive capsulitis are under recognized in adult diabetic patients occurring in 18% of the cases. Physicians should consider examining the periarticular region of the joints in the hands and shoulders whenever a diabetic patient presents with musculoskeletal symptoms. A study done in Australia concluded that Shoulder pain and disability are common, and persistent in adults with diabetes. Having higher HbA1c levels or having had treatment for retinopathy was associated with worsening shoulder pain and disability, confirming that glycaemic control and diabetic complications are associated with worsening shoulder pain or disability over 12 months of observation. A study done in America shows that the incidence of adhesive capsulitis is two to four times higher in diabetics than in the general population. The prevalence of diabetes in patients with adhesive capsulitis was 38.6%, whereby the total prevalence of a diabetic condition in patients with adhesive capsulitis was 71.5%. Shoulder capsulitis is common in type I and type II diabetic patients. However, it is associated with age in type I and II diabetic patients and with the duration of diabetes in type I patients.

**Objective:** To find the frequency of frozen shoulder associated with diabetes mellitus. To assess and treat the patients with these findings having age group of 40-60 years

**Methods:** We considered a sample size of 315 patients, assessed and treated them with different exercises and then refined their treatment through proper findings of disease. The patients were assessed for background and proliferative retinopathy, nephropathy, autonomic neuropathy, and peripheral symmetrical somatic polyneuropathy. Diseases closely related to diabetes (hypertension, history of myocardial infarction, coronary heart disease, and peripheral vascular disease) were also recorded. Multiple variables were taken in this study, they included case no., age of the patient, gender of patient, Diabetes type I & II, duration of diabetes, smoking, hypertension, and BMI of patient.

**Results:** Out of 315 diabetic patients entering to the OPD in Holy Family Hospital Rawalpindi 31.7% patients were having Adhesive Capsulitis.

**Conclusion:** Frozen shoulder affects 25-30 percent of people with diabetes. Women are more likely to develop frozen shoulder than men and it occurs most frequently in people between the ages of 40 and 60

## Introduction

Frozen shoulder or Adhesive capsulitis is an insidious (slow progressing) and painful stiffening of the glenohumeral (shoulder) joint [1-3]. It typically passes through various well-defined phases of clinical spectrum, resulting in severely compromised functional ability of the joint. The condition completely resolves in due course of time; albeit with a residual deformity. Frozen shoulder is a chronic fibrosing condition of the capsule of the joint. The predominant cells involved are fibroblasts and myofibroblasts which lay down a dense matrix of type-I and type-III collagen within the capsule. This subsequently contracts leading to the typical features of pain and stiffness. Cytokines and growth factors regulate the growth and function of the fibroblasts of connective tissue and remodelling

of the matrix is controlled by the matrix metalloproteinases (MMPs) and their inhibitors [4-7].

Several conditions have been associated with shoulder capsulitis; these include cervical spondylosis, coronary heart disease, hemiplegia, pulmonary tuberculosis, bronchial carcinoma, hyperthyroidism, cerebral tumour, and epilepsy. The relation between diabetes mellitus and shoulder capsulitis has been shown in few previous studies.

Diabetics have a higher incidence of frozen shoulder, probably because poor circulation leads to abnormal collagen repair and degenerative changes. The theory is that platelet derived growth factor is released from abnormal or ischemic blood vessels, which will then act as a stimulus to local myofibroblast proliferation. What follows has been proposed that microvascular disease, abnormalities

of collagen repair and predisposition to infection may link diabetes with frozen shoulder [8-10].

In general there are three phases of frozen shoulder and the presenting symptoms and examination findings vary depending on the phase.

1). The inflammatory phase or freezing phase - the patient has a spontaneous and gradual onset of aching pain at rest which progresses to pain with use. As the pain worsens there is frequently night pain which interferes with the patient's ability to sleep comfortably. It is common for patients to associate the development of symptoms with a trivial trauma, however, there is usually no causal relationship. During this phase the patient has very significant pain and a gradual increase in stiffness. This phase can last from 3-9 months, however in some cases it can last longer.

2). The frozen phase - the patient has a slow improvement in rest pain (pain without use of the arm) but little change in the range of motion and stiffness or the pain at the extremes of motion. This phase characteristically lasts 4-12 months.

3). The thawing phase - there is resolution of the pain and shoulder motion gradually returns toward normal. This can last from 3 months to 2-3 years [11-16].

This was an observational study in which diabetic patients coming to clinic for their routine check up were enrolled along with age and gender matched controls. Data was analyzed on Microsoft excel 2010. Demographic data regarding the age, sex, type and duration of diabetes was noted. The inclusion criteria for subjects were symptomatic shoulder problems with diabetes mellitus in age between 40 to 60 years. The exclusion criteria were; (1) any neurological conditions affecting shoulder. (2) Any pathology other than AC. (3) any surgery of head, neck or upper limb.

After the diabetic history of subjects was confirmed from the medical chart, patients were examined and assessed for pain and restriction of range of motion in their shoulder. Elderly diabetic subjects with pain and/or restriction of range of motion were referred to the orthopedic surgeon for diagnosis. Pain of the patient was recorded using the visual analogue scale (VAS). 315 patients aged between 40 to 60 years were selected. Frequency of shoulder Adhesive capsulitis was 31.7% in diabetic subjects. Assessments were performed at every visit. The primary outcome measure was active range of motion for shoulder flexion, abduction and external rotation. This was assessed using a handheld goniometer, according to standard methods. For measurement of shoulder flexion, the stationary arm of the goniometer was placed along the midline of the lateral wall of the thorax; the axis of motion was 2 cm distal to the lateral aspect of the acromion process; and the motion arm of the goniometer was placed over the humerus and aligned to the lateral epicondyle of the humerus. For measurement of shoulder abduction, the stationary arm of the goniometer was placed parallel to the midline of the thorax; the axis of motion was 2 cm distal to the posterior aspect of the acromion process; and the motion arm of the goniometer was placed over the posterior aspect of the humerus and aligned to the olecranon process of the humerus. For measurement of shoulder external rotation, the stationary arm of the goniometer was placed in the sagittal plane, perpendicular to the sternum; the

axis of motion was along the longitudinal axis of the humerus; and the motion arm of the goniometer was placed along the radius. We included 100 diabetic patients in which 21 patients were diagnosed with adhesive capsulitis.

## Results

Over all result shows a higher frequency of shoulder capsulitis in age group more than 50 years. Smokers have a high risk of Adhesive Capsulitis than non smokers. Patients having BMI greater than 25 have greater tendency towards frozen shoulder as compared to those having BMI less than 25. Similarly patients with diabetes type II are more prone to adhesive capsulitis than patients having Diabetes type II. Number of females having frozen shoulder is exceeding the number of males having shoulder capsulitis

## Discussion

This report shows that shoulder capsulitis is a common disorder in both type I and type II diabetic subjects, which is in line with previous studies [17-19]. The presence of shoulder capsulitis was highly dependent on the age and the duration of diabetes in type I diabetic subjects, whereas age was the most important factor explaining shoulder capsulitis in type II diabetic subjects. The prevalence of shoulder capsulitis increased after the age of 40 and 50 years in type I and II diabetic patients, respectively. The prevalence of shoulder capsulitis did not increase until after the duration of diabetes had exceeded 20 years in type I diabetic patients. The reason for the high prevalence of shoulder capsulitis after a short duration of diabetes in type II patients may be explained by the fact that the known duration of diabetes is probably an inaccurate marker of the true duration of the disease in many patients with type II diabetes. Two previous studies have shown an association between shoulder capsulitis and the duration of diabetes, but these studies showed no association between shoulder capsulitis and the age of diabetic subjects. Sattar and Luqman have shown no difference in the prevalence of shoulder capsulitis in insulin treated and non-insulin-treated diabetic subjects [20]. The higher prevalence of shoulder capsulitis in type II diabetic subjects seen in our study was most probably explained by the higher age of these subjects compared to type I patients. In addition to the different age and the duration of diabetes, type II diabetic subjects differed from type I in that they had a higher BMI, which is, however, unlikely to explain higher prevalence of shoulder capsulitis because no association was found between shoulder capsulitis and BMI. In the present study, shoulder capsulitis was associated with previous smoking in type I subjects, but this association was fully explained by the fact that subjects who had previously smoked were older than non-smokers or present smokers. Shoulder capsulitis was associated with present smoking in type II diabetic subjects and this was not explained by the age of the patients, by the duration of diabetes, or by the control of diabetes. The association may be explained by the fact that smoking causes vasoconstriction, which may also underlie the development of shoulder capsulitis.

## Conclusion

Adhesive capsulitis occurring in 31.7% of the cases having diabetes should not be under recognized. Attention should be paid for proper investigation and treatment of the disease to discourage the morbidity rate due to adhesive capsulitis.

## References

1. TD Bunker, J Reilly, KS Baird, DL Scotland. Expression of growth factors, cytokines and matrix metalloproteinases in frozen shoulder. *Hamblen From the University of Glasgow*. 2000; 82: 768-773.
2. Perttu ET Arkkila, Ilkka M Kantola, Jorma SA Viikari, Tapani Ronnema. Shoulder capsulitis in type I and II diabetic patients: association with diabetic complications and related diseases. *Ann Rheum Dis*. 1996; 55: 907-914.
3. "Labrum tear Johns Hopkins Orthopaedic Surgery". 2010.
4. Moore K, Dalley A, Agur A. Moore Clinically Oriented Anatomy, 7<sup>th</sup> ed. Lippincott Williams and Wilkins, 2014.
5. Scientific Keys Volume I, The Key Muscles of Hatha Yoga, Ray Long MD FRCSC, Third Edition, pg. 174.
6. "Movements of the Upper Limb — Introduction". University of Michigan Medical School. 2002.
7. Carotte S, Moffet H, Tardif J, et al. Intraarticular corticosteroids placebo-controlled trial. *Arthritis and Rheumatism*. 2003; 48: 829-838.
8. Wadsworth CT. The shoulder. In: Butler, J.P. (Ed.), *Manual Examination and Treatment of the Spine and Extremities*. Williams & Wilkins, Baltimore. 1988.
9. Rizk TE, Gavant ML, Pinals, RS. Treatment of adhesive capsulitis (frozen shoulder) with arthrographic capsular distension and rupture. *Archives of Physical Medicine and Rehabilitation*. 1994; 75: 803-807.
10. Oglivie-Harris DJ, Myerthall S. The diabetic frozenshoulder: arthroscopic release. *Arthroscopy*. 1997; 13: 1-8.
11. Pollock RG, Duralde X, Flatow EL, Bigliani LU. The use of arthroscopy in the treatment of resistant frozen shoulder. *Clinical Orthopaedics*. 1994; 304: 30-36.
12. Philadelphia Panel. Evidence-based clinical practice guidelines on selected rehabilitation interventions for shoulder pain. *Physical Therapy*. 2001; 81: 1719-1730.
13. Perttu ET Arkkila, Ilkka M Kantola, Jorma SA Viikari, Tapani Ronnema. *Ann Rheum Dis*. 1996; 55: 907-914.
14. Shakeel Ahmad, Mohammad Sohail Rafi, Iqbal Ahmed Siddiqui, Jharna Devi, Nabiha Mujahid Faruq. The Frequency of Adhesive Capsulitis In Diabetes Mellitus Patients. *Pakistan Journal of Rehabilitation*. 2012; 1.
15. LL Laslett, SP Burnet, CL Redmond and JD McNeil. Predictors of shoulder pain and shoulder disability after one year in diabetic outpatients. *Rheumatology*. 2008; 47: 1583-1586.
16. Frozen Shoulder: The Diabetic Connection Written by Ronald Grisanti, DC, DABCO, MS *American Chiropractic Magazine*. 2009; 32.
17. Rosenbloom AL. Connective tissue disorders in diabetes. In: *International textbook of diabetes mellitus, vol 2*. New York: John Wiley & Sons, 1992:1415-1431.
18. Fisher L, Kurtz A, Shipley M. Association between cheiroarthropathy and frozen shoulder in patients with insulin-dependent diabetes mellitus. *BrJ Rheumatol*. 1986; 25: 141-146.
19. Sattar MA, Luqman WA. Periarthritis: another duration related complication of diabetes mellitus. *Diabetes Care*. 1985; 8: 507-510.
20. Lundberg BJ. The frozen shoulder. *Acta Orthop Scand*. 1969; s19.