

Frozen Shoulder as a Presentation of Diabetes Mellitus.

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ABSTRACT

Background: Frozen shoulder is a condition with symptoms of shoulder pain and discomfort that is slow in onset and located around the deltoid insertion and generally resulting in inability to sleep on the affected side. Incidence of frozen shoulder is higher among diabetes mellitus patients but studies are lacking from Indian subcontinent. This study is designed to access incidence of undiagnosed diabetes mellitus among patients with Frozen shoulder. **Methods:** A cross sectional study was carried out in patients of Frozen shoulder attending OPD of Medicine and Orthopaedics Department of UPUMS Saifai, from October 2016 to April 2017. **Results:** 39.61% patients had undiagnosed DM, 12.39% patients had impaired glucose tolerance and 50.00% patients were euglycemic at the time of presentation among frozen shoulder patients. **Conclusion:** We conclude that incidence of undiagnosed DM is high among frozen shoulder patients.

Keywords: Diabetes mellitus, Frozen Shoulder, Impaired Glucose Tolerance.

INTRODUCTION

Frozen shoulder, a term coined by Codman in 1934.^[1] He used this term to describe a condition with symptoms of shoulder pain and discomfort that is slow in onset and located around the deltoid insertion and generally resulting in inability to sleep on the affected side, restricted glenohumeral elevation and external rotation,^[2] together with unremarkable radiographic findings, are also observed.^[1] Duplay³ in 1872 was the first author who described this condition as “periartthritis”. Frozen shoulder is also called as adhesive capsulitis. Shoulder pain is a commonly encountered problem, with prevalence studies indicating a frequency of 7–20% among the adult general population.^[4,5] The incidence of frozen shoulder in the general population is between 2–5%.^[6]

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It is more common among women aged 40–60 years.^[7] Bilateral frozen shoulder occurs in 20–30% of cases.^[8] Adhesive capsulitis occurs at earlier age in patients with diabetes and is usually less painful,^[9]

although it responds less well to treatment but lasts longer.^[10] The estimated prevalence is 11–30% in diabetic patients and 2–10% in non diabetics.^[11–14] Adhesive capsulitis is associated with the duration of diabetes and age.^[13–14]

Diabetes mellitus is characterised by hyperglycemia resulting due to dysregulated metabolism. Diabetes can be classified into the following general categories^[15]:

1. Type 1 diabetes (due to β -cell destruction, usually leading to absolute insulin deficiency)
2. Type 2 diabetes (due to a progressive insulin secretory defect on the background of insulin resistance)
3. Gestational diabetes mellitus (GDM) (diabetes diagnosed in the second or third trimester of pregnancy that is not clearly overt diabetes)
4. Specific types of diabetes due to other causes, e.g., monogenic diabetes syndromes (such as neonatal diabetes and maturity-onset diabetes of the young [MODY]), diseases of the exocrine pancreas (such as cystic fibrosis), and drug- or chemical-induced diabetes (such as in the treatment of HIV/AIDS or after organ transplantation) Criteria for the diagnosis of diabetes.^[15]

A1C $\geq 6.5\%$. The test should be performed in a laboratory using a method that is NGSP certified and standardized to the DCCT assay.*
OR
FPG ≥ 126 mg/dL (7.0 mmol/L). Fasting is defined as no caloric intake for at least 8 h.*
OR
2-h PG ≥ 200 mg/dL (11.1 mmol/L) during an OGTT. The test should be performed as described by the WHO, using a glucose load containing the equivalent of 75 g anhydrous glucose dissolved in water.*
OR
In a patient with classic symptoms of hyperglycemia or hyperglycemic crisis, a random plasma glucose ≥ 200 mg/dL (11.1 mmol/L).

* In the absence of unequivocal hyperglycemia, results should be confirmed by repeat testing.

Incidence of frozen shoulder is higher among diabetes mellitus patients and studies are lacking from Indian subcontinent.^[11-14] This study is designed to access incidence of undiagnosed diabetes mellitus among patients with Frozen shoulder.

MATERIALS AND METHODS

This study was carried out patients of Frozen shoulder attending out door of Medicine and orthopaedics Department of UPUMS Saifai, from October 2016 to April 2017. Prior approval of institutional ethical committee was taken to conduct the above study.

Inclusion criteria

A case of Frozen shoulder of age group 30-65 years.

Exclusion criteria

1. Patients of frozen shoulder with altered sensorium, disturbed mental state, pregnant and lactating females.
2. Patients of frozen shoulder on drugs known to cause hyperglycemia like Steroids, fluoroquinolones, second generation antipsychotics, calcineurin inhibitors, protease inhibitors, ART etc.
3. Patients with renal failure, liver failure and cardiac failure.
4. Patients with known malignancy, diabetes mellitus, transplant, septicaemia, tuberculosis, thyroid disorders and rheumatologic illness.
5. Patients with trauma to shoulder joint, shoulder joint surgery and prolonged immobilization of shoulder joint.

Sample Size

All patients satisfying inclusion and exclusion criteria were included in study.

Study Design: This was a cross sectional study.

All patients were subjected to a detailed history and thorough clinical examination including local examination by orthopaedics expert after obtaining his/her informed consent.

Investigations: Fasting and Post prandial blood sugar, serum creatinine, blood urea, complete blood count, CRP, ESR, RA factor, HbA1C, TSH, digital x-ray of shoulder joint anterior-posterior and lateral views.

Statistical analysis was done by SPSS version 22.0.

RESULTS

Total 234 patients were included in the study who satisfied the inclusion and exclusion criteria.

In this study, mean age was 49.63 years with minimum age 32 years and maximum age 65 years [Figure 1].

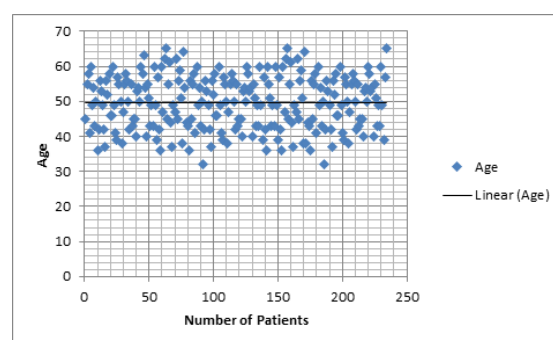


Figure 1: Age distribution in study population.

Out of total 234 patients, 169 patients (72.22%) were female and 65 patients (27.78%) were male. Sex ratio was 1:2.6 [Figure 2].

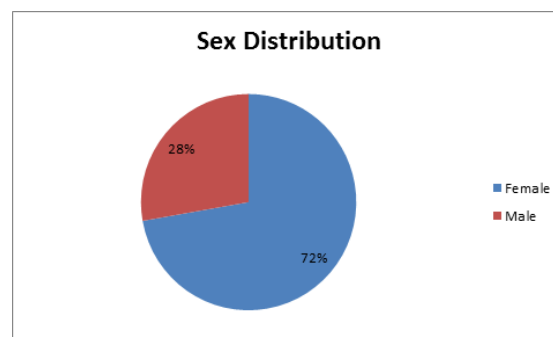


Figure 2: Sex Distribution.

Out of 234 patients, 42 patients (17.95%) had positive family history of diabetes, 192 patients (82.05%) had no family history of diabetes [Figure 3].

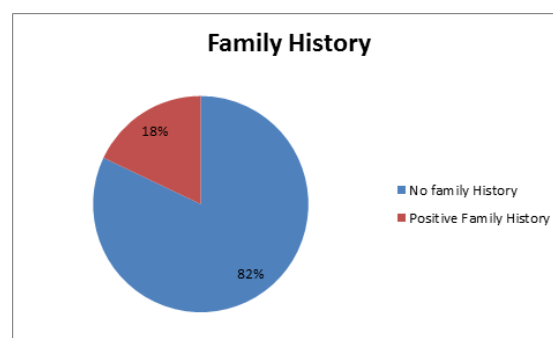


Figure 3: Family history

Out of 42 patients (17.95%) having positive family history, 22 patients (9.40%) were euglycemic, 4 patients (1.71%) had impaired glucose tolerance, 16 patients (6.84%) had undiagnosed diabetes mellitus at presentation.

Out of 192 patients (82.05%) having negative family history of diabetes mellitus, 95 patients (40.60%) were euglycemic, 25 patients (10.68%) had impaired glucose tolerance, 72 patients (30.76%) had undiagnosed diabetes mellitus at presentation.

Out of total 234 patients, 29 patients (12.39%) were found to have impaired glucose tolerance, 88 patients (37.61%) were diagnosed as a case of diabetes mellitus and 117 patients (50.00%) were found to be euglycemic at presentation.

Among newly diagnosed diabetes mellitus patients, HbA1C was found between 6.5-8.5% in 14 patients (15.91%), between 8.5-10.5% in 22 patients (25%) and more than 10.5% in 52 patients (59.09%) out of which 35 patients (39.77%) have very high HbA1C of 12.5%, [Figure 4].

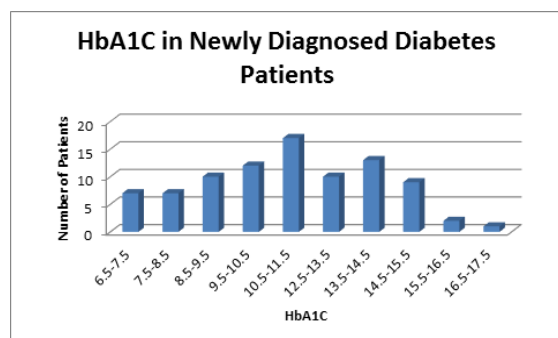


Figure 4: HbA1C in newly diagnosed diabetes patients.

Out of 60 patients with both shoulder joint involvement 31 patients had HbA1C greater than 10.5%.

Out of 234 patients included in study, right shoulder was affected in 90 patients (38.46%), left shoulder was affected in 84 patients (35.90%) and both shoulder were affected in 60 patients (25.64%), [Figure 5]. There was no significant association between right and left shoulder.

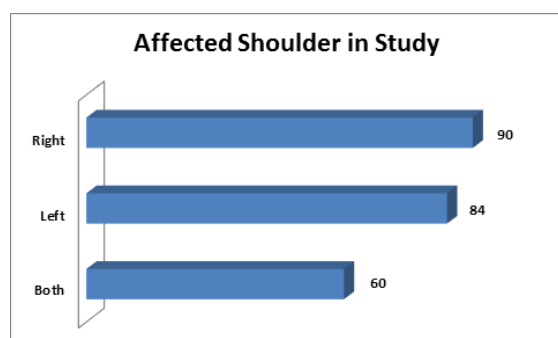


Figure 5: Affected Shoulder in Study population.

Out of 234 patients, 161 patients (68.80%) were right handed and 73 patients (31.20%) were left

handed. Out of 161 right handed patients (68.80%), both shoulder were involved in 48 patients (20.51%), only right shoulder was involved in 76 patients (32.48%) and only left shoulder was involved in 37 patients (15.81%). Out of 73 left handed patients (31.20%), both shoulder were involved in 12 patients (5.13%), right shoulder were involved in 14 patients (5.98%) and only left shoulder were involved in 47 patients (20.09%).

DISCUSSION

Our study showed that 39.61% patients had undiagnosed DM, 12.39% patients had impaired glucose tolerance and 50.00% patients were euglycemic at the time of presentation among frozen shoulder patients.

Women were affected more than men, 72.22% patients were female and only 27.78% patients were males which was comparable to available literature.^[7] Bilateral shoulder joint involvement was found in 25.64% patients which was comparable to available literature.^[8]

17.95% patients had positive family history of diabetes mellitus which was comparable to previous literature of 40% if both parents had type 2 diabetes, 3-4% if one parent had type 1 diabetes and 5-15% if sibling had type 1 diabetes.^[16]

Frequent bilateral shoulder joint involvement was found in patients having HbA1C levels more than 10.5%.

68.80% patients were right handed and bilateral shoulder joint involvement is more common in right handed patients. Dominant shoulder were more involved. Left shoulder was more commonly affected in left handed than right shoulder in right handed patients.

CONCLUSION

Based on our study we conclude that incidence of undiagnosed DM is high among frozen shoulder patients. Hence, we recommend routine screening for diabetes mellitus in frozen shoulder patients. Due to small data and demographic variation among different regions of world more research is needed to test this hypothesis.

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