

Short Communication

Prevalence of Diabetes Mellitus and Thyroid Disease in Patients Diagnosed with Adhesive Capsulitis (Frozen Shoulder)

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Keywords

- Prevalence, Diabetes Mellitus, Adhesive Capsulitis, Frozen Shoulder, Thyroid disease

Abstract

Objective: The primary aim of this study is to evaluate the prevalence of diabetes mellitus (DM) in patients seen with adhesive capsulitis (Frozen Shoulder, FS). Our secondary aim is to assess the prevalence of thyroid disease in these same patients.

Design: A retrospective chart review.

Setting: Orthopedics and Sports Medicine Clinics in the Minnesota-Fairview Network from 2009-2020.

Participants: 638 patients (417 Females and 221 Males)

Independent Variables: Frozen shoulder (FS)

Main Outcome Measures: Diabetes mellitus (DM) or thyroid disease

Results: Of the 638 FS patients, the total prevalence of DM was 49.8% (318/638). Among the 417 females with FS, 202 (48.4%) had DM. Among the 221 Male patients with FS, 116 (52.5%) had DM. The total prevalence of thyroid disease in frozen shoulder patients was 17.7% (113/638).

Conclusion: Among those seen for FS, approximately one-half also suffered from DM and approximately one-fifth suffered from a thyroid condition. Our results suggest that clinicians should consider screening patients with FS for endocrine conditions.

ABBREVIATIONS

Diabetes Mellitus (DM); Adhesive capsulitis/Frozen Shoulder (FS)

INTRODUCTION

Frozen Shoulder (FS), also known as adhesive capsulitis, is a condition in which the body forms scar tissue in the glenohumeral joint resulting in pain, stiffness, and/or functional deficit [1]. It is well documented that people with diabetes mellitus (DM) and other endocrine disorders (e.g. thyroid disease) have a higher risk of developing FS. A review stated that about 10-30% of diabetics contract FS [2].

For the clinician specializing in musculoskeletal conditions or the primary care clinician evaluating someone with shoulder pain that is felt to be due to FS, the clinical question is, what is the probability that the patient also suffers from DM? Lequesne et al., (1976) [3] evaluated 60 cases of FS and found that 17 (28%) had DM. Griggs et al. (2000) [4], evaluated 75 cases of FS and found that 8 (11%) had DM. Finally, Tighe et al. (2008) [5], evaluated 88 cases of FS and found that 34 (38.6%) had DM.

Thyroid disorders, both hypothyroidism and hyperthyroidism, are also associated with FS. Schiefer et al. [6], found the prevalence of hypothyroidism in patients with FS was 27.2%. Griggs et al. [4], found 9% of hypothyroidism cases in patients with FS.

The aforementioned studies have small sample sizes and have called for more evidence addressing the relationship between endocrine conditions and FS [5]. Therefore, the aim of this study is to evaluate the prevalence of DM or thyroid disease in a larger population of patients with FS.

MATERIAL AND METHODS

In this retrospective patient chart review, existing patient data from the University of Minnesota's Clinical and Translational Science Institute's Clinical Data Repository was obtained through Best Practice Integrated Informatics Core (BPIC). This data originates from the Electronic Health Records of patients of Fairview Health Services and the University of Minnesota Physicians, and currently includes over 2.8 million patients who have consented to have their de-identified data used for research. A data analyst for BPIC filtered the patient data for the Orthopedic and Sports Medicine Clinics in the Minnesota-Fairview Network

from 2009-2020. Inclusion criteria for adhesive capsulitis were determined from an ICD10: M75.02 diagnosis. Age and gender were recorded. Criteria for inclusion followed ICD10 diagnosis: for diabetes mellitus - diabetes 1 or diabetes 2- (ICD10: E10, E11) and Thyroid disease (ICD10: E05, E03).

RESULTS

Among the 638 FS patients, 318 (49.8%) also carried a diagnosis of DM. Females made up 65.4% (417) of the 638 FS patients. Among the 417 females with FS, 48.4% (202) had DM. DM was noted in 52.5% (116) of the 221 Male patients with FS.

The total prevalence of thyroid disease in FS patients was 17.7% (113/638). Among the 417 females with FS, 20.4% (85) had thyroid disease. Among males with FS, 12.7% (28) had thyroid disease.

DISCUSSION

The 2020 National Diabetes Statistics Report by the CDC estimates that 34.2 million US adults have DM (10.5% of the US population), of which more than 20% (7.3 million) are undiagnosed. Given that early diagnosis and prompt management of diabetes reduces the risk of disease complications [7], it is important to recognize factors that may predict a higher than average risk for DM.

Our study illustrates that DM is a relatively common occurrence in patients presenting with FS. A patient presenting to clinic with FS had nearly a 50% probability of also having DM. The prevalence of DM in those with FS was generally similar in females and males. There was a 48.4% probability that a female presenting with FS had DM and a 52.5% probability that a male presenting with FS had DM.

Our study found that 17.7% of the FS patients also carried a diagnosis of a thyroid disorder. Our results were generally similar to other studies. For example, Schiefer et al. [6], found the prevalence of hypothyroidism in patients with FS was 27.2% and Griggs et al. [4], reported 9% cases of hypothyroidism in patients with FS.

The 49.8% prevalence of DM in those with FS in our study was higher than the 38.6% from Tighe et al. [5] (2008), the 28% from Lequesne et al. [3] (1976), and the 11% from Griggs et al. [4] (2000). This may be due to our study design and referral network for our medical system. As an example, we have a multidisciplinary clinic where patients with endocrine pathologies can readily be referred to clinics which specialize in musculoskeletal concerns. We did not stratify patients by their referral source. Furthermore, if a patient was referred from an endocrinologist or a primary care clinician and carried a known diagnosis of DM, this might lead the musculoskeletal clinician to be more likely to make a diagnosis of FS.

The strength of our study is the larger sample size (638 patients) compared to the 60 patients, 75 patients, and 88 patients studied by Lequesne et al. [3], Griggs et al. [4], and Tighe et al. [5],

respectively. Our study was limited in that we used billing codes which may be imprecise. Perhaps some with mild symptoms of FS were not diagnosed as having FS, but rather as "shoulder pain, not otherwise specified." If the relationship with endocrine disorders differed in those with mild FS, then this would skew our results. From a clinical standpoint, seeking information on evaluating patients with FS for endocrine disorders, our study had the limitation that many of the patients likely knew their endocrine issues. In the U.S., approximately 20% of those with DM are unaware of their diagnosis. We recommend that future studies evaluate patients with FS diagnosis and no known endocrine condition and then evaluate them with standard laboratory tests or follow them over time to assess the prevalence of future endocrine disorders.

In summary, we found a high prevalence of endocrine disorders, especially DM, in those seen in a musculoskeletal clinic for FS. Considering that we often screen for conditions with lower prevalence rates (e.g. prevalence of DM in patients with BMI \geq 30 was about 20% in a recent large national cohort in the U.S. [8]), if a patient is presenting with shoulder pain that is felt to be due to FS, clinicians should consider screening for endocrine issues. The screening may begin with a few directed questions about thirst, urinary frequency, and fatigue, and then consideration of laboratory evaluations if concerns persist.

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