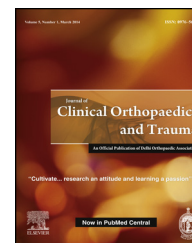




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## Original Article

# Presentation of frozen shoulder among diabetic and non-diabetic patients<sup>☆</sup>



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## ABSTRACT

**Objective:** The literature is inconsistent regarding the level of pain and disability in frozen shoulder patients with or without diabetes mellitus. The aim of this study is to evaluate some demographic features of frozen shoulder patients and to look into the disparity of information by comparing the level of pain and disability due to frozen shoulder between diabetic and non-diabetic people.

**Design:** This is a prospective comparative study. People with frozen shoulder attending an outpatient department were selected by consecutive sampling. Disability levels were assessed by the Shoulder Pain & Disability Index (SPADI). Means of pain and disability scores were compared using unpaired t-test.

**Results:** Among 140 persons with shoulder pain 99 (71.4%) had frozen shoulder. From the participating 40 frozen shoulder patients, 26 (65%) were males and 14 (35%) were females. Seventeen participants (42.5%) were diabetic, two (5%) had impaired glucose tolerance and 21 (52.5%) patients were non-diabetic. Mean disability scores (SPADI) were  $51 \pm 15.5$  in diabetic and  $57 \pm 16$  in non-diabetic persons. The differences in pain and disability level were not statistically significance (respectively,  $p = 0.24$  and  $p = 0.13$  at 95% confidence interval).

**Conclusions:** No difference was found in level of pain and disability level between frozen shoulder patients with and without diabetes.

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<sup>☆</sup> We declare that a changed version of the abstract of this study was presented in the 2nd International Rehab Forum Conference at Dhaka, Bangladesh in 2012 and was published in their souvenir.

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## 1. Introduction

Frozen shoulder, or adhesive capsulitis, is a condition characterized by painful and limited active and passive range of motion of the shoulder.<sup>1</sup> The incidence of adhesive capsulitis has been found to be two to four times higher in diabetics than in the general population.<sup>2</sup> The estimated prevalence is 11–30% in diabetic patients and 2–10% in non-diabetics. Adhesive capsulitis appears at an earlier age in patients with diabetes.<sup>3</sup>

The literature represents greater the level of pain and disability in frozen shoulder patients with diabetes mellitus than without. For instance, an Australian study showed shoulder pain and quality of life were poorer among diabetics with current shoulder symptoms than non-diabetics.<sup>4</sup> Again, diabetic persons with frozen shoulder were found to have reduced mobility compared to people who do not have diabetes.<sup>5</sup> Moreover, diabetics were reported to have worse functional outcomes as measured by disability and quality of life questionnaires (SPADI) compared to non-diabetics with frozen shoulder.<sup>6</sup>

The literature, which shows greater level of pain and disability in frozen shoulder patients with diabetes mellitus, suggests that treatment strategy might also vary between these groups. For instance, patients with diabetes and adhesive capsulitis showed less improvement of pain and function following arthroscopic rotator cuff repair than their non-diabetic counterparts.<sup>7</sup> Another work showed that shoulder pain in diabetes was often more resistant to conventional treatment.<sup>3</sup> Hence, quantification of disability level independently in frozen shoulder patients with diabetes is crucial. Increasing intensity of pain scores was associated with poor glycaemic control in diabetic frozen shoulder patients shown by higher HbA1c level.<sup>8</sup> This information raises the possibility and importance of prevention of 'greater' disability due to frozen shoulder in diabetic population by strict control of glycaemic state.

Conversely, a review article revealed that people with diabetes and frozen shoulder have significantly less pain compared with patients who do not have diabetes.<sup>3</sup> Again, the Australian study also did not show significant difference in disability ( $p = 0.16$ ) between diabetic and non-diabetic group.<sup>4</sup> This represents the dissimilarities among articles regarding the level of pain and disability.

A literature search found that only few studies discussed the disability level in frozen shoulder patients and very few looked into the pain and disability level among diabetic group. All the studies were carried out in industrialized countries. The ethnicity, living environment, lifestyle and body configuration of the people of the Asian region is quite different from western countries. So, study results from Asian low resource areas might also be different and help fill up the gap of knowledge. Unfortunately, studies of these areas have been neglected previously by western journals. Moreover, in Bangladesh, a recent population-based study showed a sharp and significant increase in the prevalence of diabetes from 2.3% to 6.8% over 5 years<sup>9</sup> pointing towards the burden of frozen shoulder and its disability in this area in future.

## 2. Methodology

This is a prospective comparative study. It was done on the outpatients of the department of Physical Medicine and Rehabilitation, 'XX' Medical College Hospital. Patients who came with shoulder pain were the target population of the study. During the data collection period, 140 patients were registered as having shoulder pain. Participants were selected from the registered patients by consecutive sampling.

### 2.1. Participants

Patients aged 30–65, clinically diagnosed as cases of frozen shoulder according to diagnostic hallmarks were allocated from 140 patients with shoulder pain. Shoulder stiffness patients due to specific or secondary causes (e.g. osteoarthritis, rheumatoid arthritis, post traumatic or post surgical stiffness) were excluded from participants list. Severely co-morbid (e.g. recent history of myocardial infarction) and pregnant women were also excluded. Suspected inflammatory cases, osteoarthritis and calcific tendinitis were excluded by ESR level and radiological features. Patients who had previous treatment for frozen shoulder were not included, either.

### 2.2. Data collection and study procedure

The study procedure is summarized by a flow chart (Fig. 1). Patients with shoulder pain attending the outpatient clinics of a hospital, department of Physical Medicine and Rehabilitation were examined by two junior post graduate trainee doctors. Relevant history was taken and a physical examination was done. The patients with frozen shoulder were diagnosed clinically and referred to the investigators. Frozen shoulder patients who met the inclusion and exclusion criteria were given a plain radiograph of the affected shoulder to exclude other pathology. Patients with known diabetes were subjected to 2 h postprandial blood glucose. Patients with no known history of diabetes were subjected to a 2-sample oral glucose tolerance test. Diabetes was diagnosed according to WHO criteria. Patients were assessed for pain and disability level. Data was collected in a semi-structured questionnaire (Fig. 2). The questionnaire consisted of 16 questions of which 10 were open-ended and 6 were closed-ended.

### 2.3. Frozen shoulder (Adhesive capsulitis)

The three hallmarks for diagnosis of frozen shoulder are progressive shoulder stiffness, severe pain (especially at night) and a near complete loss of passive and active external rotation of the shoulder.<sup>10</sup> Presence of all the three features was the diagnostic and inclusion criteria of this study.

### 2.4. Diabetes mellitus and impaired glucose tolerance states

Patients who had history of diabetes and who were on oral hypoglycemic agents (OHA) or insulin or both at the time of data collection were considered to be 'old diabetes' cases. For

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