

Prevalence of Dominant and Non-Dominant Shoulder Involvement in Diabetic Periarthritis and Severity Level of Shoulder Pain and Disability Level

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Abstract: Periarthritis shoulder is still quite a rare disease, as it only affects the shoulder joint. The clinical condition known as frozen shoulder is characterized by limited active and passive movement in all directions, including flexion, abduction, and rotation pain, stiffness and functional limitation in the humeral joint is one of the shoulder symptoms. There are no other studies that evaluate the prevalence of dominant or non-dominant shoulder in the diabetic PA shoulder and severity level of Shoulder pain and disability level (SPADI). **Purpose:** To find out the prevalence of dominant and non-dominant shoulder involvement in diabetic PA and severity level of SPADI. **Study design:** Prevalence study. **Method:** The convenient sampling method was used for the collection of samples based on selection criteria. Data from 100 samples were collected age above 35 years group. The diagnostic tool used SPADI. Further results were concluded through statistical analysis. **Result:** Among 100 members who were responded, 70 patients were noted involvement of dominant side shoulder and 30 patients have involvement of non-dominant side shoulder in diabetic PA patients. The severity level of SPADI was mild disability (5%), moderate disability (47%), severe disability (33%), very severe disability (14%), and extreme disability (1%). **Conclusion:** Hence, the study concluded the higher prevalence of dominant side shoulder involvement in diabetic PA and severity level of SPADI was higher in moderate disability (47%).

Keywords: Periarthritis, Frozen shoulder, Diabetes, SPADI

1. Introduction

Periarthritis (PA) is still a fairly uncommon condition because it only affects the shoulder joint. A clinical disease known as frozen shoulder is characterized by limited active and passive range of motion (ROM) in all directions, including flexion, abduction, and rotation. Pain, stiffness, and functional limitation in the glenohumeral joint are among the symptoms of periarthritis shoulder. [1] The term "Frozen shoulder" was first introduced by Codman in 1873 the same condition had already been labelled "Periarthritis" by Dulay. In 1945, Naviesar coined the term "Adhesive Capsulitis". [2]

Patients with frozen shoulder typically first exhibit symptoms in their sixth decade the age of 40 is extremely rare. The disorder is slightly more common in women than in males, and the peak age is 56. [4]

PA shoulder has three phases:

- Stage 1 – (freeze phase) patient complains of persistent and more intense pain even at rest followed by limitation of motion in all direction. This may occur at around 2 to 9 months.
- Stage 2 – (frozen phase) This stage is characterized by pain only with movement, significant adhesion, limited glenohumeral mobility, with substitute motions in the scapula. This stage lies between 4 to 12 months.

- Stage 3 – (thawing phase) spontaneous improvement in the functional range of motion occurs during this stage. This stage lasts for 12 to 42 months. In some case the patient never regains normal range of motion. [16]

Diabetes mellitus (DM) patients have been reported to have a two to four times greater incidence of adhesive capsulitis than the general population. People with diabetes mellitus have abnormal collagen deposition in the tendons and cartilage of the glenohumeral joint because more glucose molecules are binding to the collagen in these individuals. [3] The prevalence of PA shoulder is estimated to be 2 to 10% in non-diabetic patients (general population) and up to 11-30 % in diabetic patients and mainly affects the individual between 40-60 years of age with female predominance. [9] PA shoulder results in progressive painful restriction in range of movements and can reduce function and quality of life. It has been associated with diabetes mellitus there is considerable variation in the reported prevalence of PA in the diabetic population. [5]

In this study is to determine the prevalence of PA in DM patients and examine whether it is involvement of dominant shoulder or non-dominant shoulder and severity level of SPADI.

2. Materials and Methodology

It was a prevalence study conducted on 100 subjects with the age group of above 35 years who were having diabetic periarthritis. The data was collected from department of physiotherapy, Sri Venkateshwaraa medical college hospital and research centre, Ariyur and Aruna clinical laboratory, Puducherry, with convenient sampling method. This study period was 6 months. Questionnaire used in this study was SPADI questionnaire. Both male and female participants having complaint of PA shoulder due to DM are included in this study. Individuals who do not have DM, History of recent surgery and recent trauma, Individuals who have neurogenic conditions, Recent Road traffic accidents and surgeries were excluded in this study.

3. Procedure

A total 100 participants were selected on the basis of inclusion and exclusion criteria. Information sheet was provided regarding the procedure and informed consent was obtained from participants. 100 participants were individually filled the assessment form and SPADI questionnaire. By the percentage and severity level of SPADI the participants were separated into mild, moderate, severe disability, very severe disability and extreme disability. In this study is to determine the prevalence of PA in DM patients and examine whether the involvement of dominant shoulder or non-dominant shoulder involvement is higher and severity level of SPADI.

4. Data Analysis

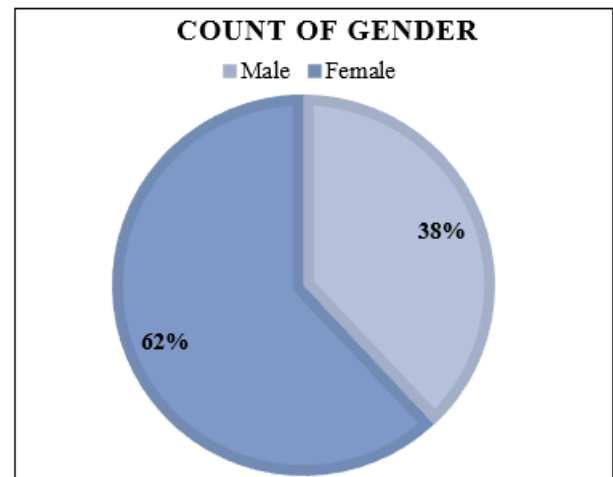
In this study the prevalence of the dominant and non-dominant shoulder involvement in diabetic PA and severity level of SPADI, all the data collected were converted into scores and entered into an excel sheet for analysis.

The Following Data were categorized and entered

- 1) Ratio of Genders:
 - a) Male = 38
 - b) Female = 62
- 2) Ratio for dominant and non-dominant shoulder involvement in diabetic PA in years.
- 3) Ratio for severity level of SPADI.

5. Result

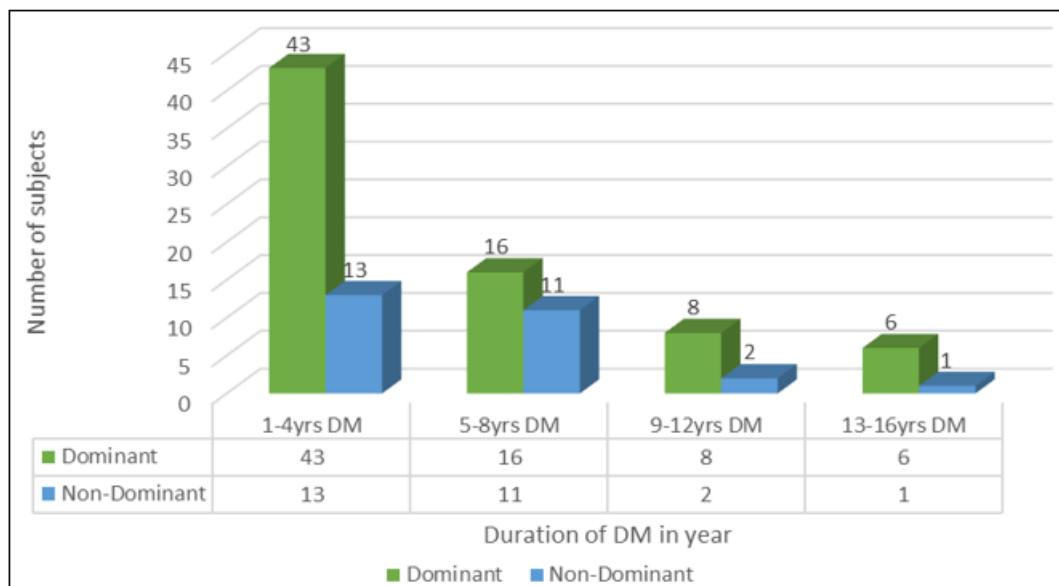
- 1) Ratio of Genders:
 - Male = 38
 - Female = 62



Graph 1: Pie chart male and female ratio

In Graph1: The distribution of participants based on gender in 100 patients female have been noted with high rate of 62% than the male 38%. It shows that female is more commonly affected than males.

- 2) Ratio for dominant and non-dominant shoulder involvement in diabetic PA in years.



Graph 2: Ratio for dominant and non-dominant shoulder involvement in diabetic PA in year.

In Graph 2: Based on dominant and non-dominant shoulder involvement in diabetic PA in year. Therefore, the year

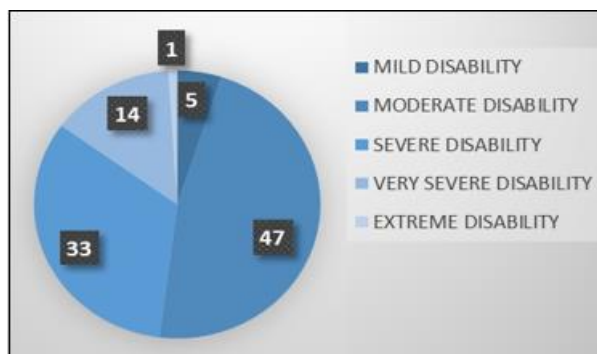
among 1-4yrs DM patient is more likely to be affected with involvement of dominant side shoulder 43 patients than the non-dominant side shoulder 13patients.

3) Ratio for severity level of SPADI.

Table 1: SPADI scores and the percentage of disability due to shoulder pain and dysfunction.

Category	Levels of Disability	No. of Individuals	Percentage
Mild Disability	0- 20	5	5%
Moderate Disability	21- 40	47	47%
Severe Disability	41- 60	33	33%
Very Severe Disability	61- 80	14	14%
Extreme Disability	81- 100	1	1%

In this table it shows the severity level of SPADI. The pain and disability levels of mild, moderate, severe, very severe and extreme disability has been seen 5% have mild disability, 47% have moderate disability, 33% have severe disability, 14% have very severe disability and 1% have extreme disability. Therefore, moderate disability 47% is higher in severity level of SPADI.



Graph 3: In graph:3 the moderate 47% disability level of SPADI is higher in diabetic PA shoulder patients.

6. Discussion

This study was conducted to identify the prevalence of dominant and non-dominant shoulder involvement and severity level of SPADI is examined in diabetic PA shoulder patients. There are no other studies examining the prevalence of dominant and non-dominant shoulder in PA and severity level of SPADI. In this study by conducting a survey revealed that PA shoulder in DM patients is high probable prevalent. Among 100n of DM patients were included according to the selection criteria. The target was fixed to include 100 diabetic PA patients. The diabetic PA patients were much interested in study and participated happily.

Katsuhiro Toda et al (2018) examined the prevalence of left and non-dominant shoulder were more frequently affected in patients with PA shoulder. This is systematic review and meta-analysis investigating whether the right and non-dominant shoulder were more frequently affected by the use of PubMed. And it is investigated that the left and non-dominant were more frequently affected significantly more than the right and dominant shoulder.

In the above article the author is used PubMed to find the prevalence of left and non-dominant shoulder or right and

dominant shoulder in PA shoulder patients and concluded that left and non-dominant shoulder is affected in PA shoulder patients by using PubMed. In this study was concluded that the dominant side shoulder involvement is more frequently affected in patients with DM.

And in this study, it shows that weather the dominant and non-dominant shoulder involvement is higher in diabetic PA shoulder patients it is concluded that dominant shoulder involvement is more frequently affected in patients with DM by assessing each and every individual by assessment sheet and severity level of SPADI were also assessed by using SPADI.

By conducting this study, it shows that age above 35yrs is more commonly involved in the diabetic PA shoulder. In 100 patients with diabetic PA participated, including both male and females, and women are affected more often than male, indicating that diabetic PA is more common in female patients.

In this study examines whether dominant or non-dominant shoulder involvement in diabetic PA and it shows the proportion of dominant side shoulder is higher in patients with diabetes. Prevalence of dominant side shoulder is more common in PA patients with diabetes according to DM year. And this shows that all patients have a dominant side during the diabetic year, where the non-dominant side of the shoulder is less in the DM year. Thus, regardless of year, the proportion of dominant shoulder is higher in PA shoulder patients with diabetes.

7. Conclusion

The Dominant shoulder was affected in 70 patients while the non-dominant shoulder was affected in 30 patients. The dominant shoulder was affected significantly more than the non-dominant shoulder in diabetic PA and severity level of SPADI was higher (i.e.)47% with the moderate disability.

8. Future Scope

8.1 Limitation

- This study for both male and female participants based on age group.
- Only one outcome tool is used.
- There was difficulty in approaching the participants and get the questionnaire done within the time.

8.2 Recommendation

- Large sized samples are recommendation to generated the prevalence.
- It is recommended to give proper awareness about periarthritis shoulder among the diabetic patients to prevent advancing disability.
- Early detection and administration of appropriate physiotherapy is needed to improve the motor abilities and daily routine activities of the diabetic PA

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