

A CROSS SECTIONAL STUDY TO ASSESS THE PREVALANCE OF MUSCULOSKELETAL MANIFESTATIONS AMONG DIABETIC PATIENTS ATTENDING TERTIARY CARE CENTRE, CHENNAI

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Abstract

Introduction : Diabetes mellitus, an endocrine disorder is characterized by derangement of glucose homeostasis. Musculoskeletal complications are the most common of the diabetic complications. These complications make the physical activity much more difficult. This study has been done to assess the prevalence of musculoskeletal problems among the diabetics.

Objective : To assess the prevalence of musculoskeletal symptoms among the diabetic patients.

Method : A cross sectional study was conducted at a Tertiary Hospital in Chennai (Govt. Stanley Medical College and Hospital). 402 diabetic patients were included in the study during the period between October 2020 to February 2021. After obtaining informed consent from the patients, details were collected by face-to face interview using questionnaire designed for the study.

Results : A total of 402 response were collected in which male and female participants were nearly equal. Most of the participants belong to upper lower class with poor educational status. Among the 402 study participants, 61.44% of the diabetic patients had at least one symptoms of musculoskeletal problems. Symptoms of musculoskeletal disorders like frozen shoulder presents in 118(29.35%) patients, medial condylitis in 101(25.12%) patients, Anserine bursitis in 150(37.31%) patients, Lateral epicondylitis in 81(20.14%) patients, Dequervain's tenosynovitis in 80(19.91%) patients.

Conclusion : Adequate management of musculoskeletal problems in Diabetic patients can improve their quality of life. Proper exercise training may not only have positive impacts on pain from the musculoskeletal system but also on glycaemic control.

INTRODUCTION

Diabetes mellitus, an endocrine disorder is characterized by derangement of glucose homeostasis which results in cardinal symptoms like polyuria, polyphagia and polydipsia. The number of people with diabetes is expected to increase from 171 million in 2000 to 366 million in 2030 [1].

Control of this metabolic disorder is mostly aimed at regulating and maintains the optimal glycaemic levels, as poor glycaemic control is associated with diabetic complications[2]. Physical activity is among one of the most effective interventions to prevent and control diabetes mellitus. In a recent study, researchers have found that HbA1C level is found to be reduced in diabetic patients undergoing physical training programs, by a large margin that decreases the risk of diabetic complications considerably [3].

Musculoskeletal complications are the most common among the diabetic complications. These complications make the physical activity much more difficult. This study has been done to assess the prevalence of musculoskeletal problems among the diabetics.

Musculoskeletal complications occurring due to diabetes can be grouped as occurring due to consequences of diabetic

complications, metabolic derangements inherent to diabetes, syndromes that may share etiologic mechanisms with microvascular disease and probable associations[4,5]. Cheiroarthopathy, Dequervain tenosynovitis, Medial epicondylitis, Lateral epicondylitis, Flexor tenosynovitis, Frozen shoulder, Dupuytren contracture, carpal tunnel syndrome and Anserine bursitis are the complications going to be evaluated in this study.

OBJECTIVES

- To assess the proportion of diabetic patients suffering from musculoskeletal complications.

METHODOLOGY

Study Design :

Cross sectional study



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Article ID: 2021:01:02:07

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Study Population :

Diabetic patients attending OPD at Stanley Medical College Hospital

Period of Study :

July 2016 to September 2016

Study Area :

Diabetic OPD in Stanley Medical College hospital

Inclusion Criteria :

Known case of Diabetes Mellitus attending non-communicable disease OPD

Exclusion Criteria :

Unconscious patients, patients with auditory impairment, visual impairment and mental deformities are excluded from this study.

Sample Size :

According to the study done by A.Majjad et al, the prevalence of musculoskeletal problems in Diabetes patients[13] was reported as 35.5%. Sample size was calculated with $P = 35.5\%$, $q = 64.5\%$. Absolute precision of 5 with 95% Confidence level, sample required for the study was calculated as follows

$$\begin{aligned} \text{Sample size } n &= 4pq/d^2 \\ &= 402 \text{ (with non-responsive rate of 10\%)} \end{aligned}$$

Sampling Technique : Convenient sampling

DATA COLLECTION :

Questionnaire was prepared with the help of previous literatures. Data was collected using the semi structured questionnaire. The questionnaire was originally made in English, and it was translated into the local language (Tamil) and back translated again to ensure appropriateness of translation. After giving preliminary introduction about the study in their mother tongue, written consent was obtained from each respondent, the validated structured questionnaire was used to assess the symptoms of musculoskeletal disorders among diabetic patients through face to face interview. Clinical examination will be done to identify musculoskeletal disorders like movement of the shoulder, de quervain disease, medial epicondylitis etc.

The following rheumatologic manifestations were diagnosed on the basis of the following clinical features.

- Diabetic cheiroarthopathy: By eliciting Prayer sign (When the patient is asked to raise his hands as like prayer position, the patient will be unable to approximate the palmar surface of the fingers) and Tabletop sign (When the patients is asked to keep his palms flat on the surface of tabletop, he will be unable to touch the palmar surface of the fingers to the table).

- Dupuytren's contracture : Patient will be examined for the presence of a nodule on the palmar aspect of the hand, palmar fascia thickening and also examined for the deformity of the second, third, fourth or fifth fingers (flexor aspect).
- Flexor tenosynovitis: Patient will be examined for the presence of nodules.
- De Quervain's tenosynovitis : Radial styloid process is examined for the presence of pain and tenderness with a positive Finkelstein manoeuvre
- Lateral epicondylitis: Lateral epicondyle is examined for the presence of pain and tenderness whenever pain is given against resistance on wrist extension.
- Medial epicondylitis : Medial epicondyle is examined for the presence of pain and tenderness whenever pain is given against resistance on wrist flexion.
- Frozen shoulder : Unilateral and/or bilateral pain over the deltoid area without any preceding history of trauma.
- Carpel tunnel syndrome : When the carpel tunnel is percussed, the patients experiences an electric sensation radiating along the course of median nerve (Tinel sign) and the when the patient is asked to hold his hands against each other in full palmar flexion, patient will have paraesthesia in 30 to 120 seconds in that position (Phalen test)

DATA COLLECTION :

After collecting, the data was compiled and entered in Microsoft Excel Sheet. Analysis was done using Statistical Software SPSS VERSION 23. All Categorical variables was expressed as Frequencies and Proportions. Chi square test was used as test of significance for categorical data.

RESULTS :

A total of 402 diabetic patients were interviewed for the study.

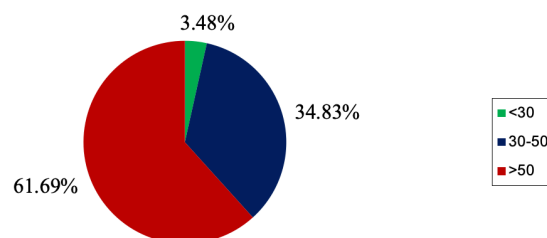


Figure 1: Age distribution among the study participants

Among the total population, only 14 (3.48%) were under 30 years of age, 140 (34.83%) were between the age of 31-49 years and 248 (61.69%) were above 50 years of age.

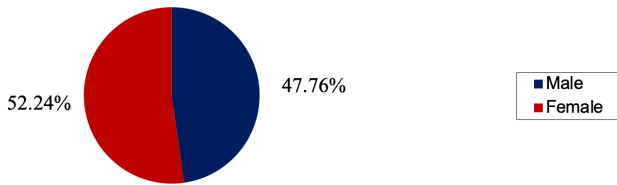


Figure 2. Sex distribution of the Study Participants

Among the study participants, 192 (47.76 %) were males and 210 (52.24 %) were females.

Table 1. Socio Economic Status of the Study Participants

Socioeconomic class	Frequency	Percentage
Upper	3	0.74%
Upper middle	23	5.72%
Lower middle	56	13.93%
Upper lower	312	77.61%
Lower	8	1.99%

Majority of the study participants belongs to upper lower class(77.6%) as per Modified Kuppuswamy scale.

Table 2. Routes of drug administration in DM patients

Route of drug administration	Frequency	Percentage
OHGD	312	77.61%
Insulin	35	8.71%
Both	55	13.68%

Of the total study population, 312 (77.61%) patients were taking oral hypoglycaemic drugs, 35(8.71%) patients were taking insulin injections and 55(13.68%) patients were taking both.

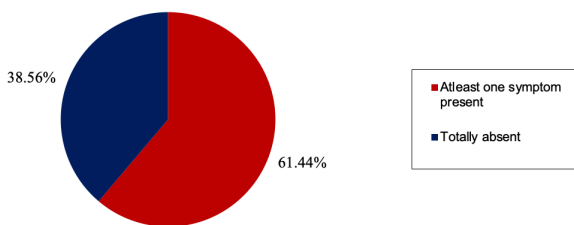


Figure 3: Presence of musculoskeletal complications in DM patients

Of the study population, 247(61.44%) diabetic patients have complaints of at least one of the musculoskeletal manifestations and 155(38.56%) patients were devoid of any such problems.

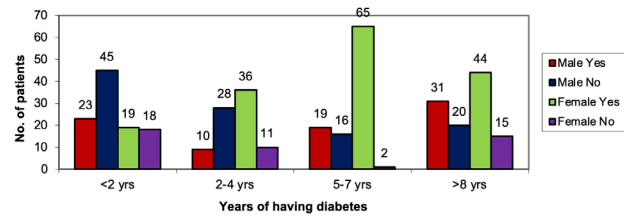


Figure: 4 Prevalence of musculoskeletal problems with respect to duration of diabetes

Of the study participants, 23(5.72%) of males and 19(4.72%) of females had musculoskeletal problems in <2 years duration of DM. In 2-4 years of DM duration group,10(2.49%) of males and 36(8.95%) of females had symptoms. In 5-7 years, DM duration group, 19(4.72%) of males and 65(16.16%) of females had symptoms. In > 8 years DM duration group, 31(7.71%) of males and 44(10.94%) of females had musculoskeletal symptoms.

Table 3: Association between musculoskeletal symptoms and duration of DM

MUSCULOSKELETAL PROBLEMS IN DM PATIENTS	DURATION OF DM		TOTAL
	<5 YEARS	≥ 5 YEARS	
PRESENT	88 (35.62%)	159 (64.38%)	247 (61.44%)
ABSENT	102(65.80%)	53(34.20%)	155 (38.56%)
TOTAL	190 (47.26%)	212(52.74%)	402

Chi square value=34.8, p value <0.005*

INTERPRETATION:

A Chi-square test of association done between musculoskeletal symptoms in DM and duration of DM in diabetic patients. Statistically significant association observed between duration of DM and occurrence of musculoskeletal problems(p<0.005*).

Table 4 : Association between musculoskeletal problem and age group in DM patients

CATEGORIZATION OF MUSCULOSKELETAL PROBLEMS	CATEGORY	AGE OF DM PATIENTS		TOTAL (n=402)	CHI SQUARE VALUE	P VALUE
		AGE < 50 YEARS	AGE ≥ 50 YEARS			
CHEIROARTHOPATHY	PRESENT	11(32.35%)	23(67.65%)	34(8.45%)	0.5471	0.45
	ABSENT	143(38.85%)	225(60.86%)	368(91.54%)		
DEQUERVAIN'S TENOSYNOVITIS	PRESENT	33(41.25%)	47(58.75%)	80(19.91%)	1.536	0.1079
	ABSENT	109(32.63%)	213(63.77%)	322(80.09%)		
MEDIAL EPICONDYLITIS	PRESENT	67(66.33%)	34(33.67%)	101(25.12%)	45.75	<0.005*
	ABSENT	86(28.57%)	215(71.43%)	301(74.88%)		
LATERAL EPICONDYLITIS	PRESENT	57(70.37%)	24(29.63%)	81(20.14%)	44.92	<0.005*
	ABSENT	96(29.91%)	225(70.09%)	321(79.86%)		
FROZEN SHOULDER	PRESENT	55(46.61%)	63(53.39%)	118(29.35%)	5.18	0.0114*
	ABSENT	98(34.51%)	186(65.49%)	284(70.65%)		
DUPUYTREN CONTRACTURE	PRESENT	16(61.53%)	10(38.47%)	26(6.46%)	6.5	0.423
	ABSENT	137(36.43%)	239(63.57%)	376(93.54%)		
CARPEL TUNNEL SYNDROME	PRESENT	31(63.26%)	18(36.74%)	49(12.18%)	15.04	<0.005*
	ABSENT	122(34.56%)	231(65.44%)	353(87.82%)		
ANSERINE BURSITIS	PRESENT	55(36.66%)	95(63.34%)	150(37.31%)	0.002	0.48
	ABSENT	93(36.91%)	159(63.09%)	252(62.68%)		

INTERPRETATION : A Chi square test of association was done between age group and musculoskeletal disorders in DM patients. Medial epicondylitis($p<0.005^*$), Lateral epicondylitis($p<0.005^*$), Frozen shoulder($p=0.014^*$), carpal tunnel syndrome($p<0.005^*$) had statistically significant association.

DISCUSSION :

Prevalence of musculoskeletal complications among the diabetics attending diabetic op at Government Stanley medical college hospital was 61.44%. Most of the study population belongs to Upper Lower class. The most common musculoskeletal complications in this study are Medial Epicondylitis (25.12%), Frozen Shoulder (29.35%) and Anserine Bursitis (37.31%).

Several studies have reported that Patient living with Diabetes [PWD] have an elevated risk of having musculoskeletal pain[2]. Nerves, muscles and bones may get damaged due to insufficient control of diabetes and cause musculoskeletal pain over time[5]. 61.44% of the diabetic patients in this study had musculoskeletal complications. This was comparable with the study done by Kim RP [10] et al, the prevalence of musculoskeletal conditions in DM patients was 58.15%.

Median epicondylitis observed in 25.12% of the study population. Lateral epicondylitis observed in 20.14% It was comparable with the study done by Maltezos E et al among the diabetic patients on diabetic hand[4]. Dupuytren contracture was present in 6.46% of patients in the current study. In a study conducted by Crispin & Alcocer-Varela, Smith et al, prevalence of Dupuytren contracture in diabetes ranges between 10% and 63%, considerably higher than among nondiabetic subjects [5].

Among diabetic subjects, carpal tunnel syndrome appears to be associated with age and diabetes duration [13] in the study conducted by Chammas et al which was comparable with our study where 12.18% of the study participants had carpal tunnel syndrome. Age of the patients plays a significant role in the development of musculoskeletal complications. A significant association was observed between age of patients with diabetes mellitus and medial epicondylitis($p<0.005^*$), lateral epicondylitis($p<0.005^*$), frozen shoulder($p=0.0114^*$), carpal tunnel syndrome ($p<0.005^*$) in this study.

CONCLUSION :

Musculoskeletal disorders and associated pain are common in patients living with diabetes. In this study, duration of DM and age of the study participants plays a

significant role in occurrence of musculoskeletal problems. Adequate management of musculoskeletal problems in Diabetic patients can improve their quality of life .Proper exercise training may not only have positive impacts on pain from the musculoskeletal system but also on glycaemic control.

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