ORIGINAL RESEARCH PAPER

Diabetology

KEY WORDS: diabetes mellitus, musculoskeletal manifestations, DISH, Charcot's joint, osteoarthritis, dupuytrens contracture, trigger finger, frozen shoulder

PREVALENCE OF MUSCULOSKELETAL MANIFESTATIONS IN PATIENTS WITH TYPE 2 DIABETES MELLITUS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Objective- This study evaluates the prevalence of musculoskeletal manifestations in patients with diabetes mellitus.

Study design/materials and methods- This is a cross sectional study conducted between November 2015 to September 2017.500 patients who attended the outdoor and indoor clinics of Hamidiya hospital, who were known cases of or newly diagnosed cases of diabetes were evaluated. After taking detailed history and clinical evaluation, necessary investigations were done.

Results-21.2%(N=106) patients of our study are having musculoskeletal manifestations. Osteoarthritis is found in 9 %(N=45) patients.2% (N=10)of the patients are having frozen shoulder and the same prevalence was there for carpal tunnel syndrome. Prevalence of dupuytrens contracture and trigger finger in present study was 1.6% (N=8) and 1.2 %(N= 6) respectively. Prevalence of DISH in present study was 2.2 %(N=11). Prevalence of Charcot's joint and gout in the present study is 1.4 %(N=7). 0. 4 %(N= 2) of our patients are having rheumatoid arthritis and 0.2% (N=1) patients are having scleroderma.

Reflex sympathetic dystrophy was found in 1.2 %(6) of the patients. Gout was found in 1.4 %(7) and Carpal tunnel syndrome was found in 2 % (10) of the patients.

INTRODUCTION

Diabetes mellitus is a common endocrine disorder in all parts of the world. It is a chronic metabolic and endocrine condition characterized by persistent hyperglycaemia with resultant morbidity and mortality related primarily to its microvascular and macrovascular complications. Despite much sophisticated understanding of the pathophysiology of diabetes and pharmacologic advancements, prevalence of this disease and sequelae continue to rise. Incidence of DM and life expectancy both have increased resulting in increased prevalence and clinical importance of musculoskeletal manifestations in patients with diabetes mellitus patients[1]. Type 1 diabetes is characterised by destruction of insulin producing beta cells resulting in lifelong insulin deficiency. Type 2 diabetes is characterised by varying degrees of insulin resistance and deficiency, Connective tissue abnormality, neuropathy, vasculopathy or combination of these underlie the increased incidence of musculoskeletal alterations in DM [2,3,4,5]. Maintaining good glycemic control by diet, exercise and medication improves or prevents the development of musculoskeletal manifestations. Diabetes causes alterations in nervous, vascular and immune systems which can lead to musculoskeletal damage[6,7,8]

Diabetes is widely recognised as causing significant morbidity and premature mortality due to myocardial infarction, stroke, renal failure etc but its less widely known that it is associated with a number of musculoskeletal conditions. Prolonged hyperglycemia result in glycosylation of collagen, which is less soluble, resistant to collagenases and accumulates in connective tissue[9,10,11,12]. It alters the extracellular structure and functions and also impairs cell viability resulting in various manifestations. Patient with diabetes may be associated with several musculoskeletal features many of which are associated with severity and duration of diabetes[13,14,15]. These conditions can be seen in general population also but they are having increased incidence in diabetic patients. These musculoskeletal manifestations result in significant morbidity to the patient. it is important to identify and treat these problems in order to prevent the disability and improve the quality of life of the patient.[17,18,19,20]

This study targets to evaluate the prevalence of musculoskeletal manifestations in patients with diabetes and stratify them according to duration of disease, sex, and type of diabetes.

This study is done

1. To find the prevalence of musculoskeletal –rheumatologic manifestations in patients with diabetes mellitus.
2. To stratify the prevalence with age, sex of the patients.

MATERIALS AND METHODS

This was a cross sectional study conducted between November 2015 and September 2017.Patients of known case or newly diagnosed cases of diabetes presenting to Hamidiya hospital who have given consent to get participated in study were evaluated. Data was collected from a total of 500 patients.

History of joint pain and its details, history of locking sensation over hand with pain, history of tingling and numbness of hands, limitation of joint movements, stiffness of joints were asked .After taking history patients underwent some necessary investigations FBS,PPBS,ASO titre, ESR, CRP,ANA,Anti ds DNA antibodies, X-ray of multiple joint /bones.

For undiagnosed suspected cases of diabetes following investigations were advised

1. FBS
2. PPBS
3. RBS
3. HbA1C

Random blood sugar:- Regardless of the last food consumed, RBS of >200 mg/dl is diagnostic of diabetes Fasting blood sugar level: -

FBS of<100 mg/dl is normal..100-125 is prediabetes, >125 mg/dl is diagnostic of diabetes.

POST PRANDIAL BLOOD SUGAR:- PPBS>200mg/dl is considered as a case of diabetes.

HbA1C- >6.5mg/dl is considered as a case of diabetes.

RESULTS

Data was collected from 500 patients who presented to outdoor and indoor clinics of Hamidiya hospital.

AGE GROUP –Among our patients,14.8 % (N=74) belonged to the age group less than 40 years, 30% (N=150) between 41-50 years. 36.4% (N=182) of the patients belonged to the age group between 51-60 year ,15.8% (N=79)and 3% (N=15) belonged to the age group above 71 years

SEX- 60.2 %(301) of our patients were male and 39.8% (199 patients)were female patients.

DURATION OF DIABETES- 115 patients were having duration of diabetes upto 5 years. 55 patients were having duration of 6-10 years.35 patients were having duration of diabetes as 11-15 years,8 patients having the duration 16-20 years and 4 patientswere having duration of more than 21 years

HbA1C -The HbA1c level of patients were analysed. Data was collected from 276 patients. 62 patients were having HbA1c level of less than 7. Sixty seven patients were having HbA1c of 7.1 to 8. Eighty nine patients were having HbA1c level 8.1 -9.Thirty two patients were having HbA1c value of 9.1-10. Four Patients were having HbA1c level of 10.1-11 and thirteen patients were having HbA1c level of above 11.

MUSCULOSKELETAL FEATURES-

394(78.8%) patients were free of musculoskeletal disorders and 106 (21.2%) patients were having musculoskeletal disorders The manifestation with highest prevalence was found to be osteoarthritis (45 patients,9%).Second most common condition found in the study was DISH(11 patients,2.2%) . Next most common features are carpal tunnel syndrome and frozen shoulder(10patients each,2%).Rest of the conditions are dupuytrens contracture- 8 patients(1.6%),Charcot's joint, gout- 7 patients each(1.4%). Trigger finger and RSD- 6 patients each (1.2%), rheumatoid arthritis was found in 2 patients (0.4%) and scleroderma were found in 1 patient (0.2%).

RELATION BETWEEN AGE OF THE PATIENT AND PREVALENCE OF MUSCULOSKELETAL MANIFESTATIONS.

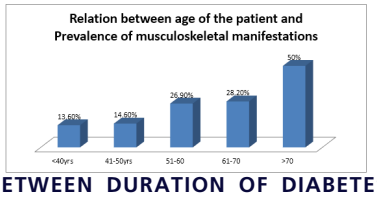
The prevalence of musculoskeletal features were categorised according to age of the patient.13.5% of the patients of age less than 40years were having musculoskeletal features.14.6% of the patients of the age group 41-50years ,26.9% of the patients of the age 51-60 years,27.8% patients were of age 61-70years and 50 % of the patients of the age group >70years were having musculoskeletal features.

Table.1

Age of the patient	Musculoskeletal manifestations
<40 yrs	13.5%(N=10)
41-50 yrs	14.6%(N=22)
51-60	2.9%(N=47)
61-70	27.8%(N=22)
>70	46.6%(N=7)

This data clearly shows that there is a direct relation between age of the patient and prevalence of musculoskeletal manifestations

Figure-1



RELATION BETWEEN DURATION OF DIABETES AND PREVALENCE OF MUSCULOSKELETAL FEATURES.

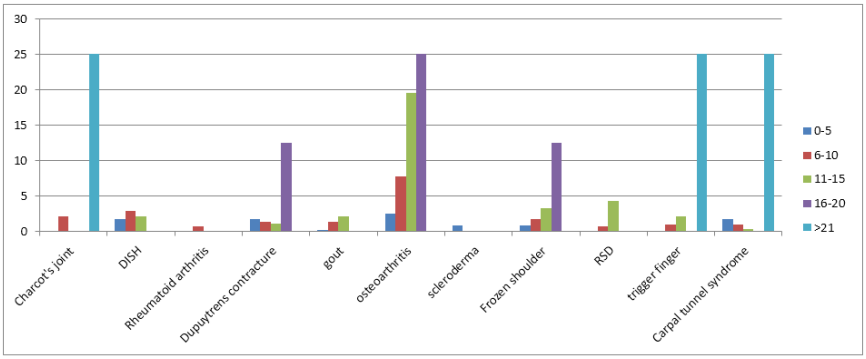
The data was analysed for relation between duration of diabetes and musculoskeletal features.

9 out of 115 patients (7.82%)with diabetes duration of up to 5 years are having musculoskeletal features.55 out of 281 patients (19.5%) with duration of diabetes as 6-10years,35 out of 92 patients(38.7%) with duration of diabetes of 11-15 years, 4 out of 8 patients (50%) with duration of diabetes of 16-20 years, 3 out of 4 patients (75%) with duration of diabetes of >21 years were having musculoskeletal features. So there is prominent relation between age of the patient and prevalence of musculoskeletal manifestations.

Table2.Relation between duration of diabetes and prevalence of different musculoskeletal manifestations.

Duration of diabetes	Number of patients	Charcot's joint	DISH	Rheumatoid arthritis	Dupuytrens contracture	Gout	Osteo arthritis	Scleroderma	Frozen shoulder	RSD	Trigger finger	Carpal tunnel syndrome	total
0-5	115 (23%)	0	2 (0.17%)		2 (1.73%)	1 (0.3%)	3 (2.60%)	1 (0.86%)	1 (0.86%)			2 (1.73%)	9 (7.82%)
6-10	281 (56.2%)	6 (2.1%)	7 (2.9%)	2 (0.714%)	4 (1.42%)	4 (1.4%)	22 (7.82%)		5 (1.79%)	2 (0.71%)	3 (1.071%)	3 (1.071%)	55 (19.57%)
11-15	92 (18.4%)		2 (2.1%)		1 (1.08%)	2 (2.1%)	18 (19.56%)		3 (3.260%)	4 (.35%)	2 (2.173%)	4 (0.35%)	35 (38.07%)
16-20	8 (1.6%)				1 (12.5%)		2 (25%)		1 (12.5%)				4 (50%)
>21	4 (0.8%)	1 (25%)									1 (25%)	1 (25%)	3 (75%)

Figure-2.Bar diagram showing relation of duration of diabetes and different musculoskeletal manifestations.



RELATION WITH HbA1c – the relation between HbA1c level at the time of evaluation and prevalence of different musculoskeletal features are described below.

Table.3 relation between HbA1C level and prevalence of different musculoskeletal manifestations.

HbA1c	Number of patients	Osteoarthritis	RSD	Trigger finger	Carpal tunnel Syndrome	DISH	Frozen shoulder	Gout	Scleroderma	Dupuytrens contracture	Charcots joint	RA	Total
6.1-7	62 (12.4%)	3 (4.8%)	0	1 (1.61%)	3 (4.8%)	1 (1.61%)	2 (3.23%)	1 (1.61%)	1 (1.61%)	0	0	0	12 (19.39%)
7.1-8	64 (12.8%)	7 (10.9%)	3 (4.68%)	0	1 (1.56%)	2 (3.12%)	2 (3.12%)	1 (1.56%)	0	2 (3.12%)	2 (3.12%)	0	20 (31.25%)
8.1-9	89 (17.85%)	20 (22.4%)	3 (3.37%)	5 (5.61%)	4 (4.49%)	3 (3.37%)	3 (3.37%)	3 (3.37%)	0	6 (6.74%)	5 (5.61%)	2 (2.24%)	55 (61.79%)
9.1-10	32 (6.4%)	9 (28.125%)	0	0	2 (6.25%)	1 (3.12%)	0	2 (6.25%)	0	0	0	0	14 (43.75%)
10.1-11	4 (0.8%)	1 (25%)	0	0	0	0	1 (25%)	0	0	0	0	0	2 (50%)
11.1-12	13 (2%)	1 (7.69%)	0	0	0	0	1 (7.69%)	0	0	0	0	0	2 (15.38%)
12.1-13	12 (2.4%)	2 (16.6%)	0	0	0	0	0	0	0	0	0	0	2 (16.6%)

Relation of prevalence of musculoskeletal manifestations with sex of the patient-

out of 199 female diabetic patients,47 patients(23.6%)were having musculoskeletal features.

Out of 301 male diabetic patients, 59 were having musculoskeletal manifestations (18.9%).

This shows that the prevalence of musculoskeletal features is more among female patients.

DISCUSSION

Diabetes mellitus affects connective tissues in many ways and cause different alterations in periarticular and skeletal systems. Diabetes mellitus is associated with a great variety of musculoskeletal manifestations, many of which are subclinical and correlated with disease duration and its inadequate control. These complications significantly compromise patient's quality of life. These complications are generally neglected and poorly managed as compared to other complications such as neuropathy, retinopathy and nephropathy. The incidence of diabetes and musculoskeletal manifestations has increased resulting in increased prevalence and clinical significance of musculoskeletal alterations in Diabetes.

21.2% patients of our study are having musculoskeletal manifestations. According to Deepti et al,it was 42 %, and in a study at kashmeeri population ,it was found to be 33%21, The differences in incidence can be due to differences in number of patients with type 1 diabetes, and can be due to the differences in duration of diabetes in different studies. Prevalence of musculoskeletal manifestations are much more in type diabetes, and the number of patients with type 1 diabetes in our study was much low. Osteoarthritis was present in a significant number of patients.

Out of 500patients,osteoarthritis is found in 9.6%. In study by Sarkar et al it is 31% and according to Mathew et al, it is 20%. This incidence can be due to overweight and also effect of mediators like adipokines released from fat tissue is also being proposed.

Prevalence of frozen shoulder is one of the commonest long term complications of diabetes. In our study 2% of the patients are having this complication. Ray et al reported it as 18 percent .more incidence was found in the study done by Ramchurun et al (25%). The differences can be due to less number of patients with long duration of diabetes.

Prevalence of dupuytrens contracture in present study was 1.6%. Ramchurun et al reported 13% prevalence Mathew et al found a low prevalence (2.25%) which is comparable with our study .this wide variation can be due to differences between type 1 and type 2 DM in their studies.22

1.2% of our patients were having trigger finger.Ray et all showed the prevalence of 7% and according to Agarwal et al, it was 2.2 %.23

Prevalence of DISH in present study was 2.2%. Sarkar et al found that the prevalence of DISH as 28% .All patients were of type 2 DM and age >45yrs. Mathew et al found the prevalence as 14% and marked hyperinsulinemia as found in those patients. The differences can be due to advancements' of investigations used.

Incidence of Charcot's joint in present study is 1.4 %. According to Agarwal et al, prevalence was 7.8 %.

Also 0. 4 % of our patients were having rheumatoid arthritis and 0.2% are having scleroderma.

Reflex sympathetic dystrophy was found in 1.2 percentage of the patients. Halesha et al shows the results as 6 %.

Gout was found in 1.4 %. Different studies show that gout can be present in 2-15 percent of the patients with diabetes.

Carpal tunnel syndrome was found in 2 % of the patients. Perkins et al found the incidence as 14 %. These differences can occur due to difference in number of patients with type 1 diabetes.

In our study there is prominent relation between duration of diabetes, age of the patient and prevalence of musculoskeletal manifestations. There is more prevalence of musculoskeletal features among female diabetic patients than male patients.

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