International Journal of Medical Research Professionals
P-ISSN: 2454-6356; E-ISSN: 2454-6364
DOI: 10.21276/ijmrp

IJMRP

Original Research Article.

Study of Rheumatological Manifestations in Type 2 Diabetes Mellitus

Amit Bhaskar[1], Deepa Rani[2*], N.K. Agrawal[3]

[1]Assistant Professor, Department of Medicine, HIMS, Varanasi, UP, India.
[2]Assistant Professor, Department of Pathology, IMS, BHU, Varanasi, UP, India.
[3]Professor, Department of Endocrinology, IMS, BHU, Varanasi, UP, India.

ABSTRACT

Objective: The present study was a hospital based observational study to find out the prevalence of rheumatological manifestations in patients of type 2 diabetes mellitus in Indian population.

Methods: The study was conducted from June 2007 to April 2008 at the Department of Endocrine and Metabolism in Sir Sunder Lal Hospital Varanasi. One hundred one patients of type 2 diabetes mellitus having various rheumatological manifestations were enrolled. Apart from routine investigations, OGTT, HbA1c, height, weight, BMI, hip and waist circumference were taken. Skiagrams of involved joints were taken.

Results: Out of 101 patients having various rheumatological manifestations, 53 patients (52.5%) had frozen shoulder, 30 patients (29%) had osteoarthritis, 12 patients (11.9%) had diabetic hand syndrome, 6 patients (5.9%) had shoulder hand syndrome, 3 patients (2.9%) had osteoporosis and 1 patient each had hammer toe and trigger finger. Twenty-six patients (49.05%) of frozen shoulder, fourteen patients (46.66%) of osteoarthritis, nine patients (75%) of DHS and five patients (83.33%) of shoulder hand syndrome had poor glycaemic control i.e. HbA_{1C} >9%.

Conclusion: Commonest rheumatological manifestations were frozen shoulder, osteoarthritis, diabetic hand syndrome and shoulder hand syndrome in order of frequency. The glycemic control was poor with HbA_{1c}>7% in 88% of the patients.

Keywords: Rheumatological Manifestations, Type 2 Diabetes Mellitus, Frozen Shoulder, Osteoarthritis, Diabetic Hand Syndrome.

***Correspondence to:**

Dr. Deepa Rani,
Assistant Professor,
Department of Pathology,
IMS, BHU, Varanasi, UP, India.

Article History:

Received: 06-05-2018, **Revised:** 02-06-2018, **Accepted:** 28-06-2018

Access this article online	
Website: www.ijmrp.com	Quick Response code
DOI: 10.21276/ijmrp.2018.4.4.079	

INTRODUCTION

The diabetes mellitus is a constellation of metabolic abnormalities that lead to chronic irreversible damage in organ systems. Although the cardiovascular, renal, and ocular complications of diabetes are the most severe, many rheumatic syndromes occur more frequently in patients with diabetes than in the general population.[1] Diabetes may affect the musculoskeletal system in a variety of ways consequent to metabolic perturbations. Musculoskeletal complications are most commonly seen in patients with a longstanding history of type 1 diabetes, but they are also seen in patients with type 2 diabetes. Some of the complications have a known direct association with diabetes, whereas others have a suggested but unproven association.[2]

As modern therapeutics have helped decrease the mortality and morbidity of diabetes mellitus, increased musculoskeletal symptoms may be discovered as these patients lead longer and more active lives. It is important to recognize the various joint and bone manifestations of diabetes.

The present study aimed to elucidate the prevalence of various rheumatological manifestations in patients of type 2 diabetes mellitus from North India and to correlate these with clinical and laboratory parameters.

MATERIALS AND METHODS

The present study was conducted from June 2007 to April 2008 at the Department of Endocrine and Metabolism in Sir Sunder Lal Hospital Varanasi. One hundred one patients of type 2 diabetes mellitus having various rheumatological manifestations were enrolled.

All the patients underwent routine investigations like complete blood count, urine analysis, fasting and post-prandial plasma glucose, serum uric acid, urea, creatinine and lipid profile. Skiagrams of the hand, shoulder, spine and other involved joints were done. Glycosylated haemoglobin (HbA1c) estimation was done. Anthropometric measurements taken were standing height

without shoes in meters, weight-with clothes in kg, hip and waist circumference in cms. Body Mass Index was calculated using the formula 'weights in kilogram/height in metre^{2}'. Patients with renal osteodystrophy and rheumatoid arthritis were excluded from study. Patient on antihypertensive will be classified controlled or uncontrolled according to American Diabetes Association 2008 (ADA 2008). Patients with BP <130/80 were said to be controlled. Anemia was considered as present when males had hemoglobin concentration below 13 g% and females had hemoglobin concentration below 12 g% (WHO classification). Data analysis was done by SPSS version 12 software. Data was expressed as range and mean±SD.

Table 1: Distribution of rheumatological manifestations

Rheumatological manifestations	Total (n=101)	
	No.	%
Frozen shoulder	53	52.5
Osteoarthritis	30	29.7
DHS	12	11.9
SHS	6	5.9
Osteoporosis	3	2.97
Hammer toe	1	0.9
Trigger finger	1	0.9

Table 2: Distribution of HBA_{1C}

ADA 2008 (HBA_{1C})	Number	Percent
<7%	12	11.9
7-9%	36	35.6
>9%	53	52.5
Total	101	100.0

Table 3: Distribution of blood glucose (Fasting and Postprandial):

	No.	%
Fasting plasma blood glucose (mg/dl)		
<130	25	24.76
>130	76	75.24
2 hours Postprandial plasma blood glucose (mg/dl)		
<180	22	21.78
>180	79	78.21

Table 4: Comparison between HbA_{1C} with rheumatological manifestations

Rheumatological manifestations	Total	HbA_{1C}			χ^2
	n=101	<7%	7-9%	>9%	(p-value)
Frozen shoulder	53 (52.5%)	4 (7.54%)	23 (43.39%)	26 (49.05%)	χ^2=3.892 (p=0.143)
Osteoarthritis	30 (29.7%)	6 (20%)	10 (33.33%)	14 (46.66%)	χ^2=2.706 (p=0.258)
Diabetic Hand Syndrome	12 (11.9%)	2 (16.66%)	1 (8.33%)	9 (75%)	χ^2=4.429 (p=0.109)
Shoulder Hand Syndrome	6 (5.9%)	--	1 (16.66)	5 (83.33%)	χ^2=2.560 (p=0.278)
Osteoporosis	3 (2.9%)	--	--	3 (100%)	--
Hammer toe	1 (1.0%)	1 (100%)	--	--	--
Trigger finger	1 (1.0%)	--	1 (100%)	--	--

OBSERVATIONS

Table 1 shows distribution of rheumatological manifestations in patients of type 2 diabetes attending diabetic clinic. Out of 101 patients having various rheumatological manifestations, 53 patients (52.5%) had frozen shoulder, 30 patients (29%) had osteoarthritis, 12 patients (11.9%) had diabetic hand syndrome, 6 patients (5.9%) had shoulder hand syndrome, 3 patients (2.9%) had osteoporosis and 1 patient each had hammer toe and trigger finger.

Out of all age group, various rheumatological manifestation was seen in mostly in age group of 46 – 55 yrs of age which was 37.6% followed by in 56-65 yrs of age that is 35.6%. A prevalence of 21.8% was seen in 36-45 years of age group. Majority of the patient were obese (grade I) i.e. 44.6%. Table 2 and 3 shows glycemic status of the patients.

Out of 101 patients 53 patients (52.5%) had poor glycaemic control i.e. HbA_{1C} level >9% which was significant. 76 patients (75.24%) had uncontrolled fasting plasma glucose i.e. fasting plasma glucose > 130 mg/dl and 79 patients (78.21%) had poor controlled postprandial sugar level i.e. Post prandial plasma glucose > 180 mg/dl. Twenty-six patients (49.05%) of frozen shoulder had HbA_{1C} > 9%, 23 patients (43.39%) had HbA_{1C} level 7-9% and 4 patients (7.54%) had HbA_{1C}<7% (good glycaemic control). Fourteen patients (46.66%) of osteoarthritis had HbA_{1C} >9%, 10 patients had HbA_{1C} 7-9% and 6 patients (20%) had HbA_{1C} <7%. Nine patients (75%) of diabetic hand syndrome had HbA_{1C} > 9%, 1 patient had HbA_{1C} 7-9% and 2 patients had HbA_{1C}< 7%. Five patients (83.33%) of shoulder hand syndrome had poor glycaemic control i.e. HbA_{1C} >9%, 1 patient had HbA_{1C} 7-9%. All 3 patients with osteoporosis had poor glycaemic control. The patient with hammer toe had good glycaemic control i.e. HbA_{1C} < 7% while the patient with trigger finger had HbA_{1C} 7-9 %.

DISCUSSION

This study shows that the prevalence of rheumatological diseases like frozen shoulder, SHS, DHS, Dupuytren's contracture and DISH are more common in the diabetic population. The mean duration of diabetes was 8.4 years in our study. Douloumpakas et al (2007) found mean duration of diabetes as 10.1 years in patients having musculoskeletal disorders with type 2 diabetes mellitus.[3]

The most common rheumatological manifestations in the study population was frozen shoulder (52.5%) followed by osteoarthritis (30%), diabetic hand syndrome (12%) and shoulder hand syndrome (6%). 3 patients (2.9%) had osteoporosis and 1 patient each had hammer toe and trigger finger.

Of the study population frozen shoulder with diabetic hand syndrome was seen in 1 patient, frozen shoulder with osteoarthritis was seen in 1 patient, frozen shoulder with osteoporosis was seen in 2 patients and shoulder hand syndrome with osteoarthritis was seen in 1 patient.

Adhesive capsulitis of the shoulder is manifested by diffuse shoulder pain associated with a loss of motion in all directions and little or no evidence of intraarticular disease. The joint capsule is thickened and adherent to the humeral head. Arthroscopy reveals a marked reduction in the volume of the glenohumeral joint. Although patients may recover spontaneously within 3 years, the syndrome may recur, and some patients with severe disease may become disabled (Crisp et al 1984).[4] The association of adhesive capsulitis and diabetes mellitus has been well documented. Bridgman et al (1972) identified adhesive capsulitis in 11% of 800 diabetic patients as compared with an incidence of 2.5% in 600 control patients. In our study 52% of the patients of type 2 diabetes mellitus with rheumatological manifestations had adhesive capsulitis/frozen shoulder.[5]

Fig. 1: Adhesive Capsulitis

Fig. 2: Adhesive Capsulitis

Osteoarthritis also called as degenerative joint disease, is the most common rheumatic disease in the general population. It may be asymptomatic or mild, but severe involvement leads to pain, stiffness, and limitation of motion in the affected joints, most commonly involving the knees, hips, and spine, and may be a source of major disability and morbidity. Several studies have suggested that the prevalence of osteoarthritis is higher in young and middle-aged diabetic patients and that joint damage starts at an earlier age and is much more severe in diabetic than in control patients (Husni et al).[6] Although insulin may alter the extracellular matrix present in bone and cartilage, the significance of such

changes, particularly as a cause of osteoarthritis, has not been determined. According to Douloumpakas et al (2007) osteoarthritis of upper as well as lower extremities was seen in 32-37% of type 2 diabetic patients.[3] Sarkar et al (2003) showed that osteoarthritis of knee was observed in 31% of diabetics as compared to only 27% of non-diabetics.[7] We observed 30 patients (29%) in 101 diabetic patients had osteoarthritis.

Diabetic cheiroarthropathy (limited joint mobility, diabetic stiff hand, diabetic contractures) initially called as stiff hand syndrome was first described in 1957 in young diabetic patients, (Lundbaeck et al, 1957).[8] It is characterized by stiffness of small joints of hands and at other sites. Diabetic hand syndrome (DHS) was seen in 12% of study population. Douloumpakas et al, (2007) showed that overall prevalence of diabetic hand syndrome in type 2 diabetes mellitus was about 8%. According to Sarkar et al diabetic hand syndrome was seen in 13.1% of diabetics but was not observed in the non-diabetic group.[3]

Fig. 3: Diabetic Hand Syndrome

Shoulder-hand syndrome (SHS) is characterized by adhesive capsulitis of the shoulder associated with pain, swelling, tenderness, dystrophic skin, and vasomotor instability in the hand. It is one of a family of disorders that includes reflex sympathetic dystrophy syndrome, major and minor causalgia, Sudeck atrophy, and algodystrophy. In one study of 108 patients with SHS or related conditions, 7.4% had diabetes (Doury et al 1981).[9] However according to Sarkar et al, SHS was seen more in non-diabetic patients (1.8% diabetics compared to 3.4% of non-diabetics). 6 patients (5.9%) had shoulder hand syndrome in our study.

The mean HbA_{1C} of the study population was 9.27%. Douloumpakas et al (2007) found mean HbA_{1C} of 7.6% in cases having musculoskeletal disorders with type 2 diabetes mellitus. Thus the patients with rheumatological manifestations had poor glycemic control.[3]

REFERENCES

1. Crispin JC, Alcocer-Varela J. Rheumatologic manifestations of diabetes mellitus. Am J Med 2003; 114:753-7.
2. Rachel Peterson Kim, MD, Steven V. Edelman, MD and Dennis D. Kim, MD. Musculoskeletal Complications of Diabetes Mellitus. Clinical Diabetes 2001; 19:132-5.
3. Douloumpakas I, Pyrpasopoulou A, Triantafyllou A, Sampanis Ch, Aslanidis S. Prevalence of musculoskeletal disorders in patients with type 2 diabetes mellitus: a pilot study. hippokratia 2007; 11(4): 216-8.
4. Crisp AJ, Heathcoate JG. Connective tissue abnormalities in diabetes mellitus. J R Coll Physicians 1984; 18:132–41.
5. Bridgman JF. Periarthritis of the shoulder and diabetes mellitus. Ann Rheum Dis 1972; 31: 69–71.
6. Husni E M, Kroop F S, Simon S L. Joint and Bone Manifestations of Diabetes Mellitus Joslin's Diabetes Mellitus 14th ed. chapter 63:1062-6.
7. Sarkar R N, Banerjee S, Basu AK, Bandopadhyay D. Rheumatological manifestations of DM. J Indian Rheumatol Assoc 2003;1:25-9.
8. Lundbaeck K. Stiff hands in long term diabetes. Acta Med Scand 1957; 158:447-51.
9. Doury P, Dirheimer Y, Pattin S. Algodystrophy: diagnosis and therapy of a frequent disease of the locomotor apparatus. 1 Vol.; 165 p. Berlin: Springer-Verlag, 1981.

Source of Support: Nil.

Conflict of Interest: None Declared.

Cite this article as: Amit Bhaskar, Deepa Rani, N.K. Agrawal. Study of Rheumatological Manifestations in Type 2 Diabetes Mellitus. Int J Med Res Prof. 2018 July; 4(4): 332-35.
DOI:10.21276/ijmrp.2018.4.4.079