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Original article

Frequency of Rheumatologic Manifestations in Diabetic Patients in Gorgan, North of Iran

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ABSTRACT

Background: Diabetes Mellitus (DM) is one of the most prevalent endocrine disorders in the world. Frequency of DM has been reported between 0.5 to 4% in different types of DM. Diagnosis of DM is based on clinical manifestations and laboratory tests. It is known that frequency of some rheumatologic problems in diabetic patients is higher than non-diabetics. The aim of this study was to determine the frequency of rheumatologic disorders in diabetes mellitus patients.

Materials and methods: In this descriptive-analytic study, diabetic patients whom referred to endocrinology center of the hospital in Gorgan, Iran, during 2008-2009 were participated. Questionnaire consisted of patient's information about diabetes mellitus type, clinical manifestation, physical examination findings, laboratory tests and Lumbar X-Ray results. Informed consent was taken from all the patients.

Results: From 256 diabetic patients who were participated in this study 82 (32.03%) were men and 174 (67.97%) women. Mean age and the mean of fasting blood sugar (FBS) values were 50.41 ± 12.29 and 186.2 ± 69.54 respectively. Rheumatologic manifestations had significant difference between age groups. Frequency of some rheumatologic manifestations like knee osteoarthritis (64.45%), lumbar osteoarthritis (54.68%) and lumbar osteopenia (40.23%) were more than the others.

Conclusion: This study showed that rheumatologic problems have considerable frequency among diabetic patients and should be considered carefully by physicians.

KEYWORDS: Diabetes Mellitus, Rheumatologic manifestations, Patient, Gorgan

INTRODUCTION

Diabetes mellitus (DM) is an endocrine disorder with major preventable complications. Although there are many studies concerning this disease, it is remained a major public health problem [1]. Depend on the DM type, its frequency changes between 0.5 to 4%. Diagnosis is based on clinical manifestations and laboratory tests, for example FBS>126mg/dl or random blood sugar (RBS) >200mg/dl. DM affects almost all organs of the body. Continuous increase in blood sugar level makes various and usually irreversible complications in different parts. There has been reported that frequency of some rheumatologic problems in diabetic patients is higher than non-diabetics [2, 3]. Bone and joints complications in diabetic patients consists of wide spectrum of different disorders like Osteopenia, osteoarthritis, soft tissue injuries in hand, shoulder joint injuries, Charcot joints, tendinitis, gout, limitation in articular movement, infectious arthritis, osteomyelitis, pseudogout, DISH (diffuse idiopathic skeletal hyperostosis), Dupuytren's contracture and trigger finger. 30-50% and 75% in type 1 and type 2 DM have limitation in their activity respectively. Discordance between pain and severity of joint injuries in patient's radiologic findings is as a rule [4-7]. Because of high prevalence of DM and frequent rheumatologic complications in our society, this study aimed to assess rheumatologic manifestations in diabetic patients of Golestan province (North of Iran).

MATERIALS AND METHODS

Study design and case selection. In a cross-sectional study during 2008-2009, all patients with more than 5 years history of diabetes mellitus after FBS sampling were referred to endocrinology clinic of the general hospital in Gorgan, Iran. Diagnosis of diabetes mellitus was confirmed by an endocrinologist previously. They completed a referral form consist of demographic and basic information including age, sex, body weight and height, family history of rheumatologic or endocrine disorder (specially diabetes mellitus), duration of disease, smoking status, drug history and etc. Body mass index (BMI) was calculated as kg/m^2 through patient's weight and height.

Clinical process. History taking and accurate rheumatologic examination was done for all selected patients by rheumatologist. Having no under treatment rheumatologic disorder, cerebrovascular or infectious disease, renal failure and trauma in recent 6 months was considered as inclusion criteria. Lumbar spine radiography was requested for all patients. If any sign of rheumatologic involvement detected in ankle or other joints, anteroposterior (AP) and lateral view radiographies were requested. All radiographs were assessed by two rheumatologists and one radiologist.

Statistical analysis. All data were analyzed by SPSS Ver.16 software for windows using parametric and non-parametric tests. $P < 0.05$ considered as statistical significance.

Ethical considerations. All patients participated with their consents and they paid no additional charge. All private data were kept secure. The work was approved by Golestan University of medical sciences ethics committee.

RESULTS

In this study 256 diabetic patients were participated. Men and women were 82 (32.03%) and 174 (67.97%) respectively. Mean age and the mean of FBS values were 50.41 ± 12.29 and 186.2 ± 69.54 respectively. They had a 7.87 ± 7.31 years mean history of diabetes mellitus and mean BMI was 28.04 ± 5.26 kg/m^2. Rheumatologic manifestations had significant differences between men and women. Knee osteoarthritis, carpal tunnel syndrome, lumbar osteoarthritis and lumbar osteopenia were more prevalent in women than

men, but dupuytren's contracture was higher in men than women. Sex distribution of rheumatologic manifestations is shown in table 1.

Table 1- sex distribution of rheumatologic manifestations in diabetic patients

Rheumatologic Manifestation		Negative		Positive		Total		P_{Value}
		n	%	n	%	n	%	
Knee osteoarthritis	M*	39	47.6	43	52.4	82	100	0.005
	F**	52	29.9	122	70.1	174	100	
Dupuytren's contracture	M	56	68.3	26	31.7	82	100	0.042
	F	139	79.9	35	20.1	174	100	
Carpal tunnel syndrome	M	75	91.5	7	8.5	82	100	0.012
	F	137	78.7	37	21.3	174	100	
Normal Lumbar X-Ray	M	53	64.6	29	35.4	82	100	0.001
	F	145	83.3	29	16.7	174	100	
Lumbar osteoarthritis	M	45	54.9	37	45.1	82	100	0.035
	F	71	40.8	103	59.2	174	100	
Lumbar osteopenia	M	62	75.6	20	24.4	82	100	<0.001
	F	91	52.3	83	47.7	174	100	

*Male **Female

There were significant differences between different age groups. Overall prevalence of rheumatologic manifestations in age group <30 years was very low, but was higher in two other groups. All compared manifestations were more common in age group >50 years than age group 31-50 years, except marginal osteophyte in lumbar vertebras that was higher in age group 31-50 years. The most prevalent finding was knee osteoarthritis (86 cases from 129 in age group >50 years and 78 cases from 115 in age group 31-50 years). Age distribution of rheumatologic manifestations in DM patients is represented in table 2.

Table 2: Age distribution of rheumatologic manifestations in diabetic patients

Age Group		<30 Years		31-50 Years		>50 Years		Total		P_{Value}
		n	%	n	%	n	%	n	%	
Knee Osteoarthritis	-*	11	12	37	40.7	43	47.3	91	100	0.001
	+**	1	0.6	78	47.3	86	52.1	165	100	
Dupuytren's contracture	-	11	5.65	95	48.7	89	45.65	195	100	0.019
	+	1	1.6	20	32.8	40	65.6	61	100	
DISH	-	12	5	112	46.7	116	48.3	240	100	0.036
	+	0	0	3	18.75	13	81.25	16	100	
Marginal osteophyte in lumbar vertebras	-	10	4	112	44.8	128	51.2	250	100	0.002
	+	2	33.3	3	50	1	16.7	6	100	
Aortic calcification	-	12	5	114	47.1	116	47.9	242	100	0.005
	+	0	0	1	7.1	13	92.9	14	100	
Lumbar Osteopenia	-	11	7.2	78	51	64	41.8	153	100	0.001
	+	1	1	37	35.9	65	63.1	103	100	

*Absent **Present

Other finding of present study was a significant difference between history of using insulin and Heberden's nodes (P=0.045). There was a significant difference between mean FBS (P=0.01) and duration of DM (P=0.007) with trigger finger. Relation between lumbar osteoarthritis and mean BMI (P=0.010) and DISH complication and history of hyperlipidemia (P=0.022) were significant. Patients with hypothyroidism and cigarette smokers were 27 and 9 respectively. No significant relation was found between hypothyroidism and smoking with rheumatologic manifestations (P>0.05).

DISCUSSION

In this study, frequency of rheumatologic problems in 256 diabetic patients was detected. Knee osteoarthritis (64.45%), lumbar osteoarthritis (54.68%) and lumbar osteopenia (40.23%), Dupuytren contracture (23.82%), Heberden's node (18.75%), carpal tunnel syndrome (17.18%) were the most prevalent rheumatologic manifestations in our patients respectively and lumbar non-marginal osteophyte was a less common problem. In a study in Germany, more than 30% of DM patients had rheumatologic symptoms [8]. In another study in Netherlands, femoral head and lumbar osteopenia were seen in 67% and 57.5% of the men and women respectively [9]. There has been reported that most prevalent rheumatologic complications in DM are limitation in joints activity, flexor tendon synovitis, Dupuytren's contracture, Carpal

tunnel syndrome and Charcot arthropathy [7]. In another study approximate frequency of some rheumatologic problems like limitation in joints activity, carpal tunnel syndrome, Trigger finger and Dupuytren's contracture were reported about 20% [3]. Present study showed that frequency of rheumatologic manifestation in diabetic patients was higher than the others. It can be due to some associated factors in the North province of Iran but needs more long term investigations. BMI had no significant correlation with rheumatologic manifestations. Reduction of L5-S1 distance showed a significant relation with BMI. Frequency of knee Osteoarthritis, Dupuytren's contracture, Carpal tunnel syndrome, lumbar osteoarthritis and lumbar osteopenia were higher in women than men. There was significant difference between various age groups with some rheumatologic problems like knee osteoarthritis, Dupuytren's contracture, DISH, lumbar vertebral osteophyte, aortic calcification and lumbar osteopenia. No significant relation was found between hypothyroidism and smoking with rheumatologic manifestations, may be due to low rates of hypothyroidism and smoking in this study and missing in actual cases.

Chammas et al. [3] reported a relation between limitation in joints activity, trigger finger and Dupuytren's contracture with Duration of DM. Also there was a correlation between these problems and doing heavy works with hand, without relation to smoking. An Hs et al. [10] found a relation between alcohol consuming and smoking with Dupuytren's contracture and both of them would increase the risk of Dupuytren's contracture progression. A retrospective study in Germany during 1956-2006 showed that only 10.3% of patients with Dupuytren's contracture had DM. They didn't find any significant relation between Dupuytren's contracture with smoking, DM and alcohol [11]. In another study in Finland, the prevalence of Dupuytren's contracture was 14%. This result was the same in both sexes, while other complications had relation with age and duration of disease [12].

In present study, there was a significant relation between hyperlipidemia with DISH. Also, correlation between hypertension and Heberden's node, and lumbar osteoarthritis was significant. Julkunen [13] did not find any relation between DISH complication and DM in his study. In a study in Budapest, DM was more prevalent in patients with DISH than control group [14]. In another study in Turkey, the prevalence of DISH in diabetic and non- diabetic patients was 12% and 6.8% respectively, but no relation was found between DM and DISH. Mean age of patients with DISH was higher than the others. There was no relation between DISH and other criteria [15]. It seems that some factors like hyperlipidemia and high level of uric acid have role in occurrence of DISH in DM patients. DISH may be has relation with factors like obesity, DM and acromegaly. Possible role of other factors like insulin, growth hormone and Insulin like growth factor (IGF) is proposed [13].

Present study showed a significant difference between mean age with rheumatologic problems, and Knee osteoarthritis with mean BMI. Also, the difference of trigger finger, mean FBS and duration of DM with rheumatologic problems was significant. There was a significant relation between BMI and lumbar osteoarthritis. In a study in Boston knee osteoarthritis was more prevalent in women than men, and was suggested that high level of BMI would increase the risk of knee osteoarthritis and physical activities might lead to decrease risk of osteoarthritis. Smoking had no relation with osteoarthritis and there was no relation between using insulin and Heberden's node in that study [16].

CONCLUSION

Our results showed that knee osteoarthritis (64.45%; 52.4% in men and 70.1% in women), lumbar osteoarthritis (54.68%; 45.1% in men and 59.2% in women) and lumbar osteopenia (40.23%; 24.4% in men and 47.7% in women) are the most prevalent rheumatologic disorders which be found by rheumatologists. Frequency of these manifestations was considerable in two diabetic populations of present study. We suggest complementary investigations to determine associated factors and comparison with control group.

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CONFLICT OF INTEREST

No conflict of interest declared.

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