

HAND PROBLEMS IN DIABETIC PATIENTS

Avadis A Muradian* & Ali Iskander#

*FICMS, Lecturer in orthopaedic, Department of Surgery, College of Medicine, specialist orthopaedic Surgeon, Basrah General Hospital, Iraq. #MB,ChB., Diploma in Orthopaedic surgery, Basrah General Hospital, Iraq.

Abstract

This present study was conducted on 436 diabetic patients, hand disorders were detected in 135 patients (180 hands). The incidence of Dupuytren's contracture was the highest 34%, carpal tunnel syndrome was diagnosed in 21% of the patients, flexor tenosynovitis in 19%, limited joint mobility in about 15%, hand infections in 10%, tumors in less than 1%, and more than one hand abnormality observed in the same patient in 15% of the diabetics. The results of this article present the prevalence of each hand condition in this common disease in our department.

Introduction

Diabetes Mellitus is a chronic metabolic disease with a long term morbidities in the general population¹⁻⁴. Most of the diabetic patients present with the usual clinical problem of diabetic foot sepsis, so much articles have been dealt with this serious condition accounting for the majority of different surgical procedures or amputations performed following the common complications such as tissue ischemia, peripheral neuropathy and the predisposition to infection⁵. Relatively little had been covered about the prevalence and pathogenesis of the symptomatic and asymptomatic hand lesions in diabetic peoples, we carried this present study to outline the incidence of hand conditions in diabetics, and to analyze further correlation with different associated factors.

Patients and methods

This prospective study included 436 Diabetic patients in Basrah general hospital at orthopedic department in the period between 2002 and 2004.

The methods consisted of history and detailed physical examination of both hands even in diabetics without hand complains, their age, sex, duration of the disease, type of treatment, associated medical conditions or complications and their presenting complains were recorded.

In addition to the laboratory investigations, plain X- Rays, electro-myographic and nerve conduction studies were performed to confirm the diagnosis in certain conditions. In 135 patients hand disorders was diagnosed, they were 81 females(60%) and 54 males(40%), the age ranged from twenty to seventy nine years, with duration of diabetes between one to twenty five years, 77 patients (57%) were on oral hypoglycemic drugs and 58 were insulin dependent (43%), 45

Correspondence to: Avadis A Muradian, Department of Surgery, College of Medicine, Basrah, Iraq.

patients(33%) had bilateral hand involvement, in 59(44%) right hand was involved, and the left in 31 (23%) patients, giving a total of 180 hands. We use to diagnose specific hand conditions that is related to diabetes mellitus.

Results

In 135 diabetic patients, several hand conditions could be identified making an incidence of 31%, most of the patients were females(60%), the average age was 55years, 90 patients (67%) were above 50 years of age and 45(33%) were less than 50. The duration of diabetes in 97 patients (72%) was more than 5 years and less than 5 in 38(28%), with average duration of 8 years.

Table I demonstrated the most common hand disorders encountered in this 135 patients and as follows; Dupuytren's contracture (DC) in 46 patients (34%), Carpal tunnel syndrome (CTS) in 29 patients(21%), flexor tenosynovitis (FTS) in 25(19%), Limited joint mobility (LJM) in 20(15%), hand infections (HI) in 13(10%), hand tumors was diagnosed in two patients (1%), and in 20 diabetics (15%) more than one problem was found. The characterisical details of the patients and their disorders were shown in Table II, Dupuytren's contracture was present in 34% of the patients(65 hands), 31(67%) were males, the average age was 60years (range 48 to 79) , 39 (85%) were above 50 years, 41patients (83%) were diabetic of more than 5 years duration, and 24(52%) were treated by oral hypoglycemic drugs (OHD). In 21% of the patients, Carpal tunnel syndrome was diagnosed, and those with associated neuropathy were excluded, 22 cases (76%) were females, 21 of them (72%) were aged more than 50 years with average of 55 years (range 35 to 63), 20 (69%) were diabetics of more than 5

years, and 21 patients (72%) were treated by OHD and only 8 (28%) by insulin.

Flexor tenosynovitis (trigger fingers) was detected in 19% of the cases, 18(72%) were females, and also of less than 50 years of age, with average of 45 years, 13(52%) were of less than 5 years diabetic patients, 17(68%) of them were on OHD.

The incidence of the limited joint mobility (Diabetic hand syndrome) was 15%, 14 cases (70%) were females, 19 patients (95%) were older than 50 years with average of 62 years (range 48 to 70), and also 95% were suffering from this disease of more than 5 years duration, and 11(55%) of them were managed by OHD. Hand infections were treated in 13 diabetic patients (10%), 10 (77%) were insulin dependent females, 9(69%) were below 50 years of age, and 10 patients (77%) with duration of diabetes of less than 5 years.

Tumors were diagnosed in only two females below 50 years of age, complaining from diabetes of more than 5 years, the histopathological result was Giant cell tumor of the Flexor tendon sheath in one case, and epidermoid cyst in the other.

Discussion

Different musculoskeletal conditions in diabetes mellitus were recently reported by many authors¹⁻⁶ but small series demonstrated the certain hand disorders.

In our study we describe the incidence of hand problems in 436 diabetics, it was 31%, and the lesions most commonly diagnosed were; 34% Dupuytren's contracture (DC), 21% carpal tunnel syndrome (CTS), 19% flexor tenosynovitis (FTS), 15% limited joint mobility (LJM), and 10% hand infection. In the study by Smith¹, the prevalence of DC in diabetics was ranged between 20-

63%, CTS 11-16%, FTS 11%, and 8-50% LJM, Gamstedt⁷ reported DC, CTS, FTS, and LJM in about 20% of the diabetic patients. Several studies have demonstrated that the microvascular and macrovascular abnormalities and the associated neuropathies are responsible for the most musculoskeletal complications in diabetes^{1,3,5,6,8} and some investigators have attributed that the causes of hand disorders in diabetes are multifactorial and are not well understood, and possibly results from the excessive and abnormal accumulation of collagen in the connective tissues, including skin, tendons, ligaments, joints and the periarticular tissues, which can make them stiffer, and also changes in the extracellular matrix of the small blood vessels, leading to loss of blood flow that may cause scarring and excessive thickening in any of the tissues of the hand which can interfere with the normal tendon gliding and joint flexibility^{2,4,6,9,10}.

In our diabetic patients, 95% with LJM and over 80% with DC were above 50 years of age with duration of the disease of more than 5 years. As described previously that their prevalence increases with advancing age and long standing diabetes, this may be due to abnormal collagen cross linking in the long lived tissues which accelerated with age and prolonged hyperglycemia^{3,4,11}. In our patients in both conditions especially LJM there was no significant relation with the type of treatment, and we found this differed from that reported that their incidence is higher in insulin dependent diabetics^{2,12,13} may be because of the late diagnosis and with several changes in the management programme of diabetes in our environment.

Carpal tunnel syndrome is a frequent disabling condition in diabetes for unknown reasons, most of our patients with CTS were women over 50 years of

age, and around 70% with duration of diabetes of more than 5 years. This correlation also have been reported that the prevalence of CTS is increased with increasing age and duration of the disease^{1,7}, the etiology may be due to many factors; median nerve entrapment or neuropathy or combination of both^{1,2,4}. Perkins¹⁴ suggested that the incidence of CTS is higher in diabetics with polyneuropathy, on the other hand flexor tenosynovitis is common in diabetic patients^{4,6,15} and of high incidence in those with daily wrist over activity¹⁶⁻¹⁹, which may also be a risk factor for developing CTS.

Flexor tenosynovitis is a common pathway in diabetic hand conditions, sometimes is an early complication from the onset of frank diabetes mellitus^{4,15} and it is related with the disease duration rather than to the age^{1,7,12}. In our 19% diabetics with FTS, 72% were women below 50 years of age, and we could not detect a significant relation with duration of the disease, this may be due undiagnosed or late diagnosis of diabetes at the time of presentation with FTS.

Infection is a well known serious clinical event, with well studied pathology especially in the foot^{5,8,20,21}. In this study 10% of diabetics presented with hand infection, most of them were of less than 5 years insulin dependent females with average age of 47 years, this events was also suggested by Kour et al⁵ that the infection in a part with high blood supply and with low incidence of neurological abnormalities had no correlation with age and the duration of diabetes, they believe that direct skin inoculation is the precipitating event leads to the sepsis and this further adverse the carbohydrate metabolism. Most of our patients were poorly controlled or uncontrolled type 1 diabetic active females subjected to unrecognized trauma during daily home

work, and in addition the local anatomical factors in the hand to some extent permeates the ease penetration and spread of the infection²². In less than 1% of our diabetics, benign tumors were diagnosed, and because of its small percentage we could not correlate its occurrence with diabetes.

In conclusion, the prevalence of Dupuytren's contracture was more in males, limited joint mobility in females; both were high with increasing age and the duration of diabetes, irrespective to the type of treatment. The incidence of Carpal tunnel syndrome was higher in

females above 50 years of age and more in the long standing diabetes and only low percentage were on insulin therapy. Flexor tenosynovitis has also more occurrence in females on oral hypoglycemic drugs, its prevalence increased independently with age and the duration of the disease. Hand infections were of high incidence in insulin dependent diabetic females, irrespective to the age and duration. Hand disorders are common in diabetes mellitus, each condition has its own factors, and sometimes we diagnose diabetes from hand, so we should think of Diabetes Mellitus in every hand problem.

Hand disorders	No. of patients	%	No. of hands
Dupuytren's contractures	46	34	65
Carpal tunnel syndrome	29	21	33
Flexor tenosynovitis	25	19	30
Limited joint mobility	20	15	37
Infection	13	10	13
Tumor	2	1	2
Total	135		180

Table I. Prevalence of hand disorders

Hand disorders	Gender		Age years		Duration of DM/year		Type of treatment		Total
	Male	Female	<50	>50	<5	>5	OHD	IDD	
Dupuytren's contracture	31	15	7	39	5	41	24	22	46
Carpal tunnel syndrome	7	22	8	21	9	20	21	8	29
Flexor tenosynovitis	7	18	18	7	13	12	17	8	25
Limited joint mobility	6	14	1	19	1	19	11	9	20
Infections	3	10	9	4	10	3	3	10	13
Tumor	—	2	2	—	—	2	1	1	2
Total	54	81	45	90	38	97	77	58	135

Table II. Patient's characteristic details.

REFERENCES

1. Smith L, Burnet SP: Musculoskeletal manifestations of diabetes mellitus. *Br J Sport Med* 2003; 37:30-35.
2. Ramnath Misra: Diabetes and musculoskeletal manifestations. *J Indian Rheumatol Assoc* 2003; 11:23.
3. Salil K Pal: Rheumatological problems in diabetes mellitus. *Jima Issue* 2002; vol 100, no 7.
4. Jonathan W: Rheumatic manifestations of diabetes mellitus. *Bulletin on the Rheumatic diseases*. 2000; vol 49, no 5.
5. Kour AK, Looi KP: Hand infections in patients with diabetes. *Clin Orthop* 1996; 1(331):238_44.
6. Belcher HJ: Diabetic stiff hand. Queen Victoria hospital. Home page 1-2.
7. Gamstedt A: Hand abnormalities are strongly associated with the duration of diabetes mellitus. *J Intern Med* 1993; 234(2):189-193.
8. Wheat LJ: Infection and diabetes mellitus. *Diabetes care* 1980; 3(1):187-197.
9. Rosenbloom AL: Connective tissue and joint diseases in diabetes mellitus. *Endocrinal Metab Clin North Am* 1996; 25(2); 473-483.
10. Mohammad A: Limited joint mobility in diabetes. *Post grad Med* 1999; vol 105, no 2.
11. Huntely A: Diabetes Mellitus; Review. *Dermatology online Journal* 1995; vol 1, no 2.
12. Renard E: Increased prevalence of soft tissue hand lesions in type 1 and type 2 diabetes mellitus. *Diabete Metab* 1994; 20(6): 513-521.
13. Michael D: Endocrine origins of rheumatic diseases. *Post Graduate Med* 2002; vol 11, no 4.
14. Perkins: Carpal tunnel syndrome in patients with diabetic polyneuropathy. *American Diabetes Assoc* 2002; 25(3):565-569.
15. Sibbit WL: Corticosteroid responsive tenosynovitis is a common pathway for limited joint mobility in the diabetic hand. *J Rheumatol* 1997; 24:931-936.
16. Blanc PD: Self reported carpal tunnel syndrome. *Am J Ind Med* 1996; 30: 362-368.
17. Loslever P: Biomechanical and epidemiological investigation of carpal tunnel syndrome at work places with high risk factors, *Ergnomics* 1993; 36:537-554.
18. Robert R. Carpal tunnel syndrome: Current concepts. *J South Ortop Assoc* 1999; 8(3).
19. Menarguez P: Carpal tunnel syndrome in primary care. Impact of workplace risks. *Aten Primaria* 1996; 17(3):187-192.
20. Baiju R: Quantifying the risk of infectious diseases for people with diabetes. *Diabetes care* 2003; 26:510-513.
21. Joshi: Infections in patients with diabetes mellitus. *N Engl Med* 1999; 341: 1906-1912.
22. Philip E: Campbell's operative orthopaedic. Ch 79: Hand infections. 9th edition 3735-3745. Mosby 1998.