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Original Article

Is diabetic dermopathy related with microangiopathic complications?

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Abstract

Aim: Diabetic dermopathy is a skin disease, seen in patients with diabetes mellitus, characterized by atrophic scar and hyper-pigmented lesions. Recently, it was proposed that this disease might be associated with other microangiopathic complications of diabetes such as retinopathy, nephropathy, and polyneuropathy. In this study, patients with diabetic dermopathy were compared with two control groups to test the validity of these associations.

Material and Methods: Twenty-three patients, who admitted to Dermatology Outpatient Clinic Health Sciences University Gazi Yaşargil Education and Research Hospital and diagnosed as diabetic dermopathy were included in the study. Twenty-three patients with well controlled diabetes mellitus (Control Group A) who treated as outpatients and 23 patients with diabetes mellitus who had poor general status and hospitalized by internal medicine department (Control Group B) were included as two control groups. Patients were evaluated in terms of retinopathy, nephropathy, neuropathy, heart attack history and diabetic foot ulcer.

Results: In the study 82.6% (n:19) of patients were male and 17.4% (n:4) were female (female: male ratio 4.75:1). There was no significant relationship between fasting blood glucose and HbA1c elevation with retinopathy, neuropathy, polyneuropathy and diabetic foot. However, there was a significant relationship between fasting blood glucose levels and heart attack. Although heart attack history and diabetic foot was more common in the patient group and retinopathy, nephropathy and polyneuropathy was more frequent in the Control Group B, there was no significant difference between both groups.

Conclusions: In conclusion, microangiopathic complications, heart attack and diabetic foot are not only common in the patient group with diabetic dermopathy but also in the Control Group B. Even though these complications were more common in these two groups, there was no significant difference between each and the other diabetic (Control Group A).

Keywords: Diabetes mellitus; diabetic dermopathy; skin lesions; cutaneous manifestations.

INTRODUCTION

Diabetic dermopathy (DD) is the most common lesion of the skin in diabetic patients (1,2). DD lesions consisted of bilateral and asymmetrically distributed, sharply limited, round, brownish, atrophic scars with diameters of 1 cm. Pigment intensity is related to the degree of atrophy. It is generally asymptomatic. Lesions are typically common in the pretibial area; however, they can also develop in the thigh (2), trunk and lower abdominal region (2-4). Atrophic appearance and localization suggest a trauma origin (3,4).

Hans Melin first described the disease as brownish lesions in the lower extremities (4). Later in 1965, these lesions were evaluated as the cutaneous finding of diabetic microangiopathy by Binkley and named as diabetic dermopathy (5).

Its incidence is between 7-70% (1,4,6). Diabetic dermopathy is more common in patients older than 50 years of age with long-term diabetes history (1). In addition, it is two times more frequent in men (1,4,7). There are also controversies about whether it is pathognomonic for diabetes mellitus because it is also seen in patients without diabetes (3,7). In this study, the relation of diabetic dermopathy with other complications of diabetes was investigated by comparing diabetic dermopathy patients with two control groups with and without hospitalization indication.

MATERIAL and METHODS

Ethical committee approval was obtained for the study. The study included 23 patients with diabetic dermopathy

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and 2 control groups of 23 patients with similar age and gender characteristics. (Control Group A): 23 patients with well-controlled diabetes mellitus who treated as outpatients. (Control Group B): 23 patients with bad controlled diabetes mellitus who had poor general status and hospitalized by internal medicine department. Age, gender, dermatological characteristics of their lesions, presence of active lesion, triggering factors and accompanying dermatological diseases of these patients were recorded. All lesions were photographed. Patients were evaluated in terms of retinopathy, nephropathy, neuropathy, heart attack history and diabetic foot ulcer that were related to microangiopathic complications. Fasting blood glucose and HbA1c values tof the patients were measured biochemically. Data were analyzed by using Chi-Square, independent-samples T test and paired-samples T test in the SPSS 17 package software.

RESULTS

Of the patients included in the study 82.6% (n:19) were male and 17.4% (n:4) were female (female: male ratio 4.75:1). Age of the patients varied between 46-72 and mean age was 59.1±8.08. There was no statistically significant difference between the ages of the patient group and control groups. Mean age of the control groups was 60.78±8.96 and 59.34±8.98 (Table 1). Duration of the lesions varied between 1 week and 5 years (mean 20±20.4 months).

There was trauma history in 73.9% (n:17) of the patients. Among the patients 69.6% (n:16) of the traumas were mechanical; 17.4% (n:1) was heat contact, whereas 17.4% (n:4) of the patients stated that they were unable to recall the way trauma had occurred and 8.7% (n:2) stated no trauma. There was erythematous papule and plaque type active lesions in 30.4% (n:7) of the patients (Figure 1). Post-inflammatory hyperpigmentation and accompanying white atrophic scars were observed in 95.7% (n:22) of the patients. (Figure 2). Only 1 patient had just white atrophic scar. There was polyneuropathy history in 52.2% (n:12) of the patients, nephropathy in 39.1% (n:9), retinopathy in 34.8% (n:8), diabetic foot in 34.8% (n:8) and heart attack in 34.8% (n:8). At least two microangiopathic complications were observed in 43.3% of the patients. Although mean HbA1c was higher in the Control Group B there was no significant relation between HbA1c and fasting blood glucose among patient group and control groups (p>0.05, Table 2). The evaluation revealed no relation between the presence of active lesion and HbA1c and microangiopathic complications (p>0.05).

Fasting blood glucose and HbA1c had no relation with retinopathy, neuropathy, polyneuropathy and diabetic foot, while high fasting blood glucose and heart attack history had significant relation with patients who had heart attack history (p:0.043). Although the patient group had higher diabetic foot incidence and heart attack history, no significant difference was found when compared to the control groups (p>0.05). Despite the control group B had higher incidence of retinopathy, nephropathy and polyneuropathy, there was no significant difference between the patient group and the control groups (p>0.05).

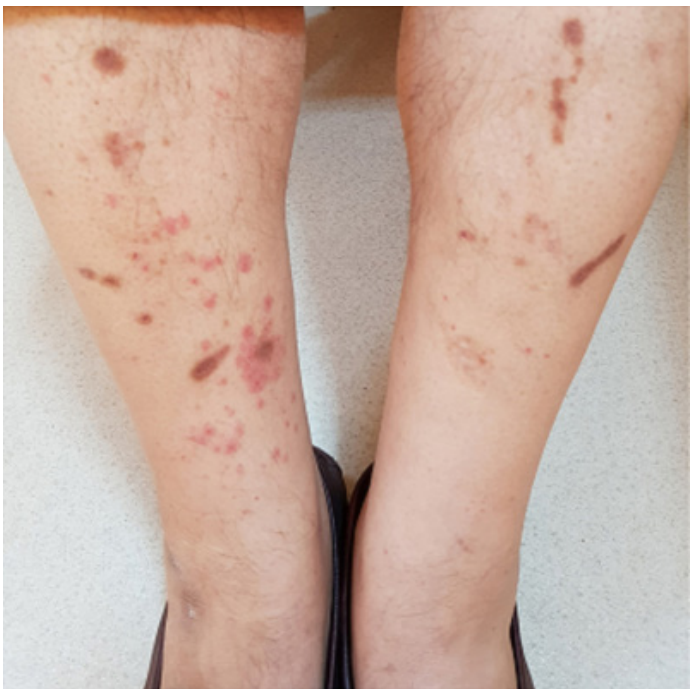

Figure 1. The picture shows a dark erythematous and atrophic active diabetic dermopathy lesion surrounded by pink color.

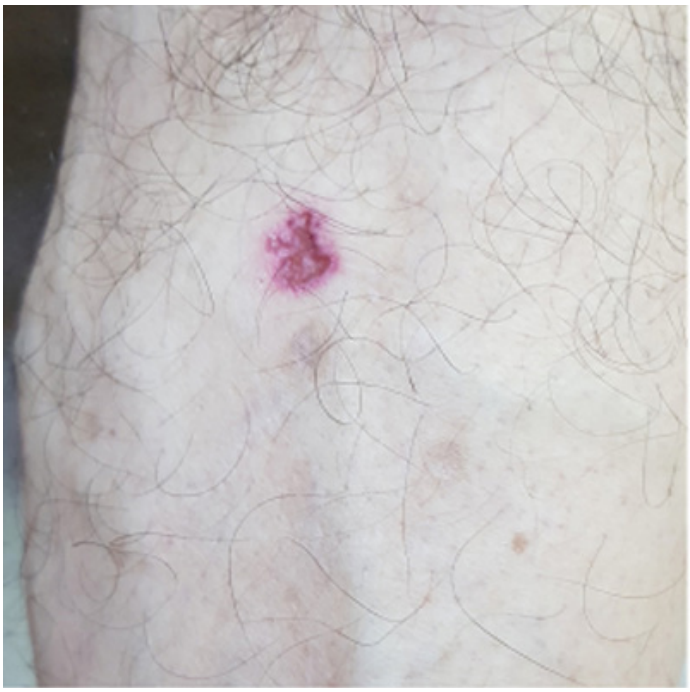

Figure 2. Dermatologic examination includes round, oval, linear (Koebnerized) brown macules and patch lesions, white atrophic scars and erythematous macules and patch lesions (vasculitic lesions)

Table 1. Demographic and clinical data of groups

Demographic and clinical data	Patient Group	Control Group A	Control Group B
Mean age	59.1 (SD±8.08)	60.78 (SD±8.96)	59.34 (SD±8.98)
Gender (male/female)	19/4	19/4	19/4
Number of lesions	18,22 (SD±13.66)	_	_
Mean duration of the lesions (month)	20(SD±20.4)	_	_
Trauma history	73.9% (n:17)	_	_
Active lesions	30.4% (n:7)	_	_

Table 2. Frequency of diabetic complications and laboratory parameters of all groups

Diabetic complications	Patient Group n (%)	Control Group A n (%)	Control Group A n (%)	p value
Polyneuropathy	12 (52.2%)	9 (39.1%)	18 (78.3%)	p>0.05
Retinopathy	8 (34.8%)	2 (8.7%)	10 (43.5%)	p>0.05
Nephropathy	9 (39.1%)	7 (30.4%)	13 (56.5%)	p>0.05
Heart attack	8 (34.8%)	1 (4.3%)	6 (26.1%)	p>0.05
Diabetic foot	8 (34.8%)	1 (4.3%)	3 (13%)	p>0.05
Mean HbA1c (%)	9.47 (SD±2.34)	8.23 (SD±1.93)	10.6 (SD±2.02)	p>0.05
Mean fasting blood glucose (mg/dL)	241 (SD±93.9)	217 (SD±99.1)	290 (SD±118.4)	p>0.05

DISCUSSION

The cause of diabetic dermopathy is unknown and it is not related with the decreased local perfusion (8). Poor wound recovery against mild traumas is another potential explanation (9,10). Another recommended mechanism claim that diabetic neuropathy leads to DD by causing subcutaneous nerve degeneration (9). The most acceptable explanation is the relation of microvascular complications of diabetes and DD.

Its pathogenesis is not fully understood. Experimental trauma application performed with plastic hammers failed to cause DD lesions (4). According to a theory it is believed that heat changes in the skin increases plasma viscosity and vascular fragility (5). In a related experimental study, DD lesions were created through hot or cold thermal stimulation in patients with long-term diabetes (5). However, on the contrary to the theory, vascular blood flow was shown to increase instead of decreasing. Authors reported that scars were related to defective wound healing, not ischemia (8).

Progression of DD is variable and does not improve with glycemic control (6,11). Individual lesions can maintain for about 18-24 months or may remain permanently. Disease may heal completely without scar upon regress or pigmentation without atrophy may remain. Periodically, old lesions recover and new ones constantly occur (2,4,5,12).

Biopsy is not specific. As differential diagnosis; fungal infection should be considered for early-stage lesions and pigmented purpuric dermatosis, purpura annularis telangiectasia, purpuric lichenoid dermatitis, pigmented stasis dermatitis and papulonecrotic tuberculid should be considered for late stage lesions (5).

The presence of at least four lesions was recommended as to be the characteristic of diabetic dermopathy (13). In our study, we have chosen two control groups; with (Control Group A) and without hospitalization indication (Control Group B). In our study, patients with at least four lesions were evaluated. Patients with any lesions in the control groups were not included in this study. However, there was a significant relationship between heart attack and fasting blood glucose levels.

In a study in which Romano et al evaluated 49 patients with diabetic dermopathy, they reported 18 patients had well-controlled diabetes, 13 had fairly-controlled diabetes and 18 had poorly controlled diabetes (3).

Lesions onset spontaneously as round or oval, red or purple, as papula or macule (4). Then these lesions progress into scar-like lesions (5). 30.4% of our patients had both DD and active lesions. The presence of active lesions was not associated with HbA1c and microangiopathic complication (p>0.05). The evaluation revealed no relation between the presence of active lesion and HbA1c and microangiopathic complications (p>0.05).

Studies showed a strong relation between DD and nephropathy, neuropathy, retinopathy (1, 10). In a study, the presence of neuropathy in 42.9% of patients with DD was evaluated as significant (3). Coronary artery disease was detected in 53% of these patients (3). Melin stated that diabetic dermopathy had a significant relation with retinopathy, nephropathy and neuropathy (4). In another study, retinopathy was found to be significantly higher in patients with diabetic dermopathy (6). A relation between DD and neuropathy was observed in another study, while there was no relation between retinopathy and nephropathy (3). In our study, although heart attack

history and diabetic foot was more common in the patient group and retinopathy, nephropathy and polyneuropathy was more frequent in the Control Group B, there was no significant difference between both groups.

In a study comparing the number of microvascular complications and diabetic dermopathy, DD was reported in 21% of the patients without complications, 52% in patients with 1 complication, 57% in patients with 2 complications and 81% in patients with three complications (1). In this study, at least two microangiopathic complications were observed in 43.3% of the patients.

Surprisingly, DD and HbA1c has been reported to have no relation (3). In our study, fasting blood glucose and HbA1c had no relation with retinopathy, neuropathy, polyneuropathy and diabetic foot, while high fasting blood glucose had significant relation with patients who had heart attack history.

CONCLUSION

In conclusion, the patients with DD must be evaluated in terms of other microangiopathic complications of the diabetes. Achieving glycemic control in patients can be important to decrease the risk of microangiopathic complication, heart attack and diabetic foot.

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