

Diabetic Dermopathy as Marker for Early Detection of Myocardial Infarction.

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ABSTRACT:

BACKGROUND:

There are many cutaneous signs in diabetes mellitus (DM) which is the most common endocrine disorder among the general population. Diabetic Dermopathy (DD) or Shin Spots are the most common cutaneous signs of diabetes. Although they occur individually in people who do not have diabetes, if four or more are present the specificity is high for microvascular disease in other tissues.

OBJECTIVE:

This study was done to evaluate frequency of diabetic dermopathy among diabetic patients and use this obvious subtle clinical sign as marker for early detection of atherosclerotic changes in diabetic patients including myocardial infarction

PATIENTS AND METHOD:

This study was done at diabetic center in Sulaimani intensive care unit(IUC) in teaching hospital of Suliamani during the period from November 2008 to June 2009. A total of 384 patients with Diabetes mellitus were included in this descriptive case series hospital-based study. All patients were diagnosed by specialist diabetician as a case of DM depending on classic diagnostic criteria of DM.

All patients were thoroughly assessed regarding the age, sex, skin color, duration of diabetes mellitus and treatment regime. Careful skin examinations has been performed for diabetic dermopathy, diabetic wet gangrene of foot. Diagnosis of myocardial infarction was done either by electrocardiographic changes or by plasma biochemical marker.

RESULTS:

Eighty four (21.9%) case with DD were reported in our study; fifty four (64.3%) case of them were females while the remaining 30 (35.7%) cases were male.

Diabetic patients with myocardial infarction were 44(11.5%) cases, 36 cases as acute MI. while the other eight cases were old cases of MI. Of these 44 cases 16(36.4%) had DD while 28(63.6%) had no DD.

CONCLUSION:

There was a statistically significant association between the myocardial infarction and the frequency of diabetic dermopathy and we should use this obvious subtle clinical sign as marker for early detection of atherosclerotic changes in diabetic patients including myocardial infarction. Wet gangrene of the foot is also considered a marker of bad glycemic control.

KEY WORDS: diabetic dermopathy, diabetes mellitus , myocardial infarction.

INTRODUCTION:

Diabetes mellitus (DM) is a worldwide disease and the most common endocrine disorder. Its prevalence is increasing in the present time with changes in lifestyle of general population⁽¹⁾. The metabolic dysregulation associated with DM causes secondary pathophysiological changes in multiple organ systems that impose a tremendous burden on the individual with diabetes and on the

health care system. DM is the leading cause of end stage renal disease, non traumatic lower extremities amputation and adult blindness. It also predisposes to cardiovascular disease^(1, 2).

The affected organs include cardiovascular, renal and nervous system, the eyes and the skin. Approximately 30% of patients with diabetes mellitus develop a skin disorder sometime during the course of disease.^(3, 4)

The cutaneous disorders associated with DM are characterized by disorders with evidence for metabolic, vascular, neurological or immunological pathogenesis induced by glucose and insulin abnormalities and by disorders associated with diabetes, but without a clear pathogenesis^(5, 6, 7).

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Prevalence of DD according to age group and standard deviation was measured by T-test.

RESULTS:

Three hundred and eighty four (384) cases of DM were included. The study was done in two centers, 348 patients were attending diabetic center/suliamania and the other 36 patients were enrolled from ICU in teaching hospital/suliamania that admitted as cases of acute MI.

Two hundred eighty four (74.0%) were females and 100(26.0%) were males. The age of the patients ranged between 14-82years with mean age 51.9 years.

Eighty four (21.88%) case with DD were reported in our study (table-I) and Fig 1; fifty four (64.3%) cases of them were females while the remaining 30 (35.7%) case were males.

Regarding skin phototypes; skin type II= 48 patients (12.5%), III= 132 patients (34.4%), IV= 184 patients(47.9%) and V= 10 patients (5. 2%).

According to age of diabetic patients in relation to DD, the number of the patients who were 57 and 60 years old whom had DD was 8 cases which were considered the higher frequency of DD than other age group.

Diabetic dermopathy was not reported among patients whose age located between 14-26 years although some of them were insulin dependent and their diabetes was badly controlled.

Of interest those patients who were 80 and 82 years old reported in this study were two cases only, and both of them had DD. Variable frequency of DD were reported among patients with age between 26-80 years.

The result in table- 2 shows the following finding:

* Diabetic patients with myocardial infarction were 44(11.5%) cases while 311 (80.9%) patients had no MI and 29(7.6%) patient had ischemia.

Of these 44 cases 16 (36.4%) had DD while 28(63.6%) had no DD (36 cases were admitted as acute MI in ICU in teaching hospital/Suliamani. While the others 8 cases who attended to the diabetic center/Suliamani were old cases of MI.) . P-value of this association was 0.00 which is highly significant.

In the patients with no MI (311), 54 (17.4%) had DD and 257 (82.6%) had no MI.

From 29 patients with ischemia 14 (48.3%) had DD and 15(51.7 %) had no DD. (Figure 2)

* Wet gangrene of the foot was found in 16(4.2%) cases, those with DD were 10(62.5%) cases, and those without DD were 6(37.5%). The P-value was< 0.001 which is highly significant.

* Regarding the control status of diabetes mellitus we found that:

* Uncontrolled state of DM was 207(53.9%) case, 69(33.3%) case of them had DD and those without DD were 138(66.7%), the P-value of the association was< 0.001 (highly significant).

* Controlled state of DM was 177(46.1%) case, 15(8.5%) case of them had DD and those without DD were 162(91.5%).

* Regarding the duration of the disease among diabetic patients it was show that:

One hundred and ninety cases (49.5%) had duration of illness less than 5 years, 26(13.7%) case of them had DD which considered the higher percentage of DD in comparison to other classes, with decreasing frequency of DD among the class with higher duration of illness, this association had P-value was 0.00 which is highly significant.

* The frequency of DD among patients according to therapeutic regimen:

The patients who are on oral hypoglycemic drugs comprised the higher number of the patients in the study and found the higher frequency of DD among them and the least frequency of DD were found in those who are on diet regimen only. P-value was 0.048 which is significant.

DISCUSSION:

Diabetic dermopathy is a subtle sign, patients and diabetician are unaware about, and they believe it is a trivial injury to the skin⁽¹⁰⁾. Meanwhile in this study we found that there is a significant association between DD with myocardial infarction and wet gangrene of the foot which may indicate a bad glycemic control. These results suggest that patients susceptible to diabetic dermopathy have a functional abnormality in blood flow as seen previous study⁽¹³⁾.

DD is more evident in patients with skin color type I &II, that's 50% of diabetic patients in west European countries had DD and the least percentage found in Indian country which reach to 15% of diabetic patients where the skin color of general population is type V &VI⁽¹⁰⁾.

The frequency of DD was 21.9% among patients included in this study. Overall normal frequency of DD ranging from 15-50%⁽⁹⁾. This percentage of DD was consider accepted because most of our patints were skin type III & IV.

We found a strong relation between MI & DD (P-value were < 0.001 which is highly significant), According to this strong association, DD can be considered a powerful marker for MI. This result is approximately similar to preivous studies^(10, 14, 15).

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The wet gangrene of the foot one of the serious skin manifestations that occur in DM ^(16,17) and the same association were found between DD and wet gangrene of the foot. Sixteen (4.2%) case with wet gangrene and amputation of at least one leg of variable level below and above knee joint, 10(26.5%) had DD in the contra lateral side while the remaining 6(37.5%) had not and this reveal the angiopathic changes in the skin of diabetic patients in relation to DD. P-value were <0.001 which is highly significant.

Uncontrolled diabetes is that which is not treated at all or being inadequately treated, causing blood sugar levels to rise in the patient. If allowed to persist, this condition can cause serious medical complications ^(1,14). In this study the uncontrolled state of DM shows higher frequency of DD in comparison to that seen in controlled cases which is shown in table 2.

Forty six(54.8%) patients who had taken OHD and have DD were uncontrolled glycemic state and this is most likely because patients were not aware about the control state of the disease when he/she take OHD for many years thinking that his/her DM is under control and need not consult diabetician while the subtle complication of diabetes is ongoing process.(P –value between DD and bad control state of DM is <0.001 which is highly significant) which help us to consider the DD as a potent clinical marker of bad control state of DM in addition to fasting plasma glucose and HbA1c. The higher frequency of DD is more in patients around the age of 55 years which is similar to the frequency of DD among elderly diabetic patients ⁽⁶⁾.

Duration of illness regarding DD shows decreasing frequency of DD with increasing duration of illness. One hundred and ninety (49.5%) patients who included in this study were located within class I (< 5yr) duration of illness, higher frequency of DD 26(13.7%) patients were found in this class, this is a real grave of high incidence of DM which is discovered recently among the population. This result differs from that which is mentioned in Fitzpatrick's text book of dermatology ⁽⁶⁾ which reveals that DD is more often present in longer duration of illness, this difference most probably due to many causes including that half number of patients included in the study were located in class I, delay the diagnosis of the disease(DM) because most of our cases from rural area, so they do not do routine regular check up and didn't consult a physician unless complications of the disease appear or discovered accidentally.

In addition lack of a physical activity and unbalanced high caloric diet among younger age group with lack of health education about the disease, all these were contributes to this difference in frequency of DD in our locality and international data.

In review of therapeutic regimens patients on OHD were 247(64.3%) which comprises the higher group number of the cases in the study. Frequency of DD were 46(18.6%) which is the higher in comparison to other therapeutic regime as while patients who were on diet regime were the least number and the least frequency of DD, this is also indicate that the high calorie diet and lack of the physical activity is a potent risk factors for affection with DM ⁽⁹⁾.

Table 1: Significance of Diabetic dermopathy according to age.

Variables	Mean age (year)	N	Std. Deviation	P value
Diabetic dermopathy				
No	50.36	300	12.13	< 0.001
Yes	57.73	84	10.74	

P-value < 0.001 mean highly significant

Table 2: Diabetic dermopathy vs present variables.

Variables	Diabetic dermopathy		P- value
	Yes N (%)	No N (%) total	
Myocardial infarction			
No MI	54 (17.4)	257(82.6) = 311	< 0.001
Yes MI	16 (36.4)	28(63.6) = 44	
Ischemia	14 (48.3)	15(51.7) = 29	
Total	84 (21.9)	300(78.1) = 384	
Control of DM			
Uncontrolled	69(33.3)	138(66.7)	< 0.001
Controlled	15(8.5)	162(91.5)	
Duration of DM			
Less 5	26(13.7)	164(86.3)	< 0.001
5-10	21(20.4)	82(79.6)	
10-15	15(28.8)	37(71.2)	
15-20	11(57.9)	8(42.1)	
More than 20	11(55.0)	9(45.0)	
Treatment			
Diet	3(15.0)	17(85.0)	0.04
Oral hypoglycemic drugs	46(18.6)	201(81.4)	
Insulin	8(22.2)	28(77.8)	
Irregular between OHD and insulin	27(33.3)	54(66.7)	
Wet gangrene			
present	10(62.5)	6(37.5)	< 0.001
absent	64(18.2)	288(81.8)	

P-value < 0.001 mean highly significant

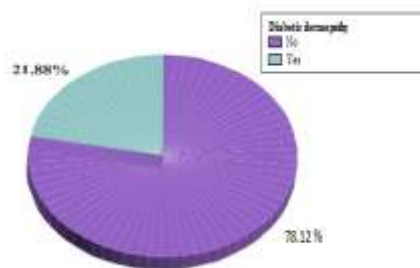


Figure 1: The frequency of DD.

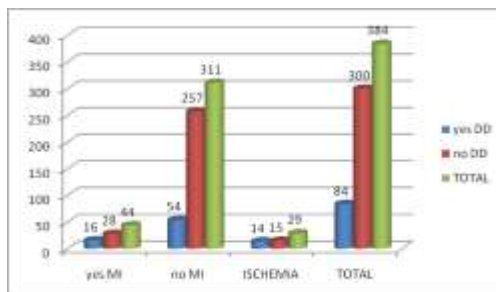


Figure 2 : The distribution of DD among diabetic patients with MI and ischemia



Figure 3 : Multilesional score of DD on the shin of 56 years old male with DM.



Figure 4: Multi lesional score DD with kobner phenomena

CONCLUSION:

There is a strong relationship between the myocardial infarction, ischemia and the frequency of diabetic dermopathy among diabetic patients. The presence of DD should prompt aggressive intervention to detect DM patients and prevent complications of the disease.

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