

Skin Infections in Patients with Diabetes Mellitus : a case-series study

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الخلاصة :

تمت دراسة عشره الاخم-اج الجلدية لـ 72 مريضاً من مرضى كلو-م-م-ن راجعوا قسم الأمراض الجلدية في مستشفى ألدوانييه التعليمي العام في مدينه ألدوانييه خلال الفترة من حزيران 2006 ولغاية أيار 2007. شملت الدراسة (72) مريضاً يعانون من اضطرابات جلديه، جمعت معلومات كاملة من المرضى باستخدام استمارات استبيان خاصة، تم اخذ المسحات الجلدية ومن مناطق مختلفة من الجسم والفحص المجهرى مع زرع العينات لكل مريض . تم عزل الجراثيم المرضيه من 48 مريض (66.6%) كانت اعلى نسبه للجراثيم هي الفطريات (50%) تليها البكتريا (43.7%) واسباب اخرى (6.2%) كانت اعلى نسبه للفطريات هي (54%) *Tinea pedis* تليها *Candida albicans* (37.5%) , *Tinea cruris* (4.1%) *Tinea corporis* (4.1%) أما البكتريا فكانت اعلى نسبه هي (9.80%) *Staphylococcus aureus* تليها *strptococci sp.* بنسبه (14.2%) اما *Klebsiella sp.* , *Proteus sp.* فكانت النسب (7.4%) و (7.4%) على التوالي . الفئة العمرية الأكثر تعرضاً لأصابه هي (40-60) سنة وأن نسبه الاصابه المذكور اعلى من الإذناث والمصابين بـ النوع الثاني من داء السكرى اعلى من المصابين بالنوع الأول

Abstract:

This study was designed to evaluate skin infections in 72 diabetic patients who consulted the department of dermatology in Al- Diwaniya hospital in Al-Diwaniya city collected during the period form June 2006 until may 2007 . A total of (72) patients suffering from cutaneous disorders were seen.

Full information were obtained from each patient using special questionnaire sheet . The rate of pathogenic microorganisms isolated from 72 patients was (66.6%). The highest rate of microorganisms among patients was fungi 24 (50%) ; followed by bacteria in 21(43.7%) ;other causes 11 (6.2%).

The highest rate of fungi was *Tinea pedis* (54.1%) followed by *Candida albicans* (37.5%) ; *Tinea cruris* (4.1%) *Tinea corporis* (4.1%) . Among bacteria the highest rate was *Staphylococcus*

aureus (9.80%) ; followed by *Streptococci sp.* (14.2%) , whereas *Klebsiella sp.* , *Proteus sp.* were (4.7%) ,(4.7%) respectively .

The peak age of incidence was (40-60) years ,it was found that male are more then females and type 2-Diabetic patients more than type 1- Diabetic patients .

Introduction:-

Diabetes mellitus describes a metabolic disorder of multiple etiologies that is characterized by continually elevated levels of blood glucose diabetes is distinguished from the pre-diabetes state in impaired glucose tolerance (IGI) & impaired fasting glucose (IFG) ,which cannot be diagnostically categorized as either normoglycemia or diabetes mellitus.

Diabetes mellitus is caused by absolute or relative insulin deficiency (Mcmahon et,al .,1995).

The cutaneous disorders of DM are well known & considered as common as (paron & lambert ,2000).

The exact pathogenesis of most of these dermatoses is unknown , it is reason- able to assume that vessel &connective tissue alterations as well as impairment of the immune system & other associated metabolic changes caused by diabetes play an important role (yosipovitch et al., 1998).

The most recent W.H.O. classification from 1999 (table 1) distinguishes four types of diabetes mellitus based on etiology (WHO,1999).

table -1- types of diabetes mellitus:-

1-type -1- diabetes mellitus.
2- Type -2- diabetes mellitus.
3- Gestational diabetes.
4- other type of diabetes :- a- maturity onset diabetes of the young (MODY). B- Type Insulin resistance. C- Steroid diabetes. D-Endured disorders E- Syndromes disorders F-Miscellaneous forms.

The purpose of the present study was to evaluate the different aspects of commonly-encountered skin infections in diabetic patients

Materials & methods

The study was conducted in the department of dermatology, AL-Diwaniya teaching hospital of Diwaniya city. 72 Diabetic patients attending the dermatology out-patient clinic & diabetic inpatients with skin problems were examined over a period of 12 months from June 2006 to may 2007.

A diagnosis of diabetes mellitus was made using uniform criteria :Symptoms of diabetes plus random blood glucose concentration $>11.1 \text{ mmol/l}$ (200 mg / dl) or fasting plasma glucose $>7.0 \text{ mmol/l}$ (126 mg / dl)tests.

Full information was obtained from each patient using special questionnaire formula, including name , sex , age , residency ,address , type of DM.

Skin examination was performed for each patient , followed by skin swabs , microscope examination & culture.

Specimens taking from skin, hair, scalp, nails, sole, toe webs. Back, groin &anogenital region, are inoculated cultured using MaCconkey ,blood & nutrient agar by streaking , then incubate at 37°c to 24-848 hours for bacteria & specimens are inoculated to inhibitory mold agar or sabouraud's agar slants containing

cyclohexamiede & chlorampheniol to suppress mold & bacterial growth incubated for 1-3 weeks at 25'c .

Results:

In this research; 72 diabetic patients with coetaneous problems were included, (42) patients of them were found to have infections problems, and (24) of cutaneous conditions were related to other non-infections origin.

The general profile of the patients is given in table -2- of the 72 patient's were males (59.5%) and females (40.2%).

The majority (48.6%) were between 40 to 60 years of age ,among patients presenting with skin complaints .There were more type -2- diabetics (61 patients) than type-1- {11}.

Table-2-general profile of the 72 diabetic patients:-

sex	NO.	%
Male	43	59.7
female	29	40.2
total	72	

*sex distribution of patients:-

*age distribution of patients:-

age	NO.	%
> 0-20 years	2	2.7
20-40 years	17	23.6
40-60 years	35	24.6
60-80 years	18	25
total	72	

*type of diabetes

type	NO.	%
Type 1	11	15.7
Type 2	61	84.7
Total	72	

Cutaneous conditions related to infections are given in table -3-. The percentage of the fungal infections was (50%) .The highest rate was *Tinea pedis* 13 (54.1%) , followed by *Candida albicans* 9 (37.5%) and *Tinea corporis* ,*Tinea cruris* 1 (4.1%), 1 (4.1%) respectively.

While the highest rate of isolated from patients was *Staphylococcus aureus* 17 (80.9%), followed by *Streptococci sp.* 3 (14.2%) and *Klebsiella sp.* 1 (4.7%) , *Proteus sp.* 1 (4.7%) . (6.2%) of skin infections was due to other causes (viral, parasitic...etc) ,while folliculitis 12 (57.1%) was the most common bacterial infection.

table-3- cutaneous conditions related to infections organs:-

cause	No.	%
Bacteria	21	43.7
fungal	24	50
Others *	3	6.2
total	48	66.6%

* : (viral , parasitic ,..etc)

Table -4- Bacterial infections:-

Bacteria	NO.	%
<i>Staphylococcus aureus</i>	17	80.9
<i>Streptococci sp.</i>	3	14.2
<i>Klebsilea sp.</i>	1	4.7
<i>Proteus sp.</i>	1	4.7
total	21	

Table -5- fungal infections:-

Fungi	NO.	%
<i>Tinea pedis</i>	9	37.5
<i>Candida albicans</i>	13	54.1
<i>Tinea corporis</i>	1	4.1
<i>Tinea cruris</i>	1	4.1
Total	24	

Table -6- common bacterial infections or (common coetaneous infections in Diabetic patients):-

Bacterial infections	NO.	%
Folliculate	12	57.1
Impetigo(bullous)	4	19.0
Furunculosis	2	9.52
Carbuncle	3	14.2
Total	21	

Discussion:-

Similar to previous study (Nigam & pande, 2003) , male patients were found to be more than female patients. The majority of our patients were in the 40-60 year age group .an observation also noted by other researchers (Mahajan et al .,2003)

The relative increase in the incidence of cutaneous involvement with age in diabetic patients may be attributed merely to the long duration of diabetes in these patients .

The long disease duration may reflect the progressive microangiopathy which is related mainly to the prolonged progress of the disease regardless to its poor control or well-control .These extensive microangiopathy would affect negatively the humeral & cellular immunity { }

The majority of patients in this study had type 2-DM.as it has been noted in other studies (Nigam & pande,2000) ,apparently reflecting the general distribution pattern of type -1 & type -2 DM cases in world population (paragon & lambert ,2000).

As it stated , the duration of the disease is DM-type -1 is short , that reflected the lesser microangiopathic process & lesser affected cellular & humoral immunity. That is why the cutaneous infections were common in type -2 DM..

Among the cutaneous disorders observed in our DM patients :Infections (Bacteria & fungi) comprised the largest group of (66.6%) of the cases, similar to previous reports (mahajan et al., 2003).

Defective neutrophil chemotaxis & cellular immunity defects in patients with DM may explain the higher rates of bacterial & fungal infection more than others.

The presence of higher percentage of *T. pedis* i.e.(54.1%) more than other dermatophytes could be explained by :-

- 1- the more effected skin of fobts than skin of the body by microangiopathic process in diabetes .that is why the lesser percentage of *T. corporis* & *T. cruris*.
- 2- local causes due to more liable foot for trauma & fissuring due to peripheral dryness , with subsequent penetration of dermatophytes .

The presence of higher rates of *Staph. aureus* may be attributedd to :-

- 1- Increased bacterial adherence due to changes in the keratinized layer of diabetic skin. {7}
- 2- Resistance to *Staph* . Infection is reduced in patient with poorly controlled diabetes. {8} We can seen that follicular, impetigo (i.e. minor skin infections) are present more commonly then furuncles

& carbuncles , simply due to the presence of proper antibiotic therapy for such patients. {9} lastly it is well known that diabetic patients are susceptible to infections probably due to hyperglycemia & defects in polymorph nuclear leukocyte function .(Kimberly ,1994).

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