Scholars LITERATURE

La Prensa Medica Argentina

Research Article

DOI: https://doi.org/10.47275/0032-745X-320
Volume 107 Issue 2

Clinical Study of Erythrasma in Diabetic Patients

Raisan Mahdi D Al-Obaidi*, Salam Abdullah Khallaf

Misan Health Directorate, Ministry of Health/Environment, Misan, Iraq

Abstract

This study was conducted to characterize the frequency of occurrence, extent, age, and sex incidence of Erythrasma in diabetic patients according to the type, duration, and state. A cross-sectional and case-control combined study of 200 diabetic patients and 160 non-diabetic groups visiting the outpatient clinic of Al-Saddar Teaching Hospital, Department of Medicine and Dermatology, from the period of December 2019 to July 2020. About the diabetic group, their ages range from 12-60 years with a mean age of 37.6 years. 148 patients were non-insulin-dependent diabetes mellitus type (NIDDM) and 52 patients were IDDM. Among all the diabetic patients examined by wood's light to detected Erythrasma infection 34 (17%) were found to be affected, from 26 males (76.5% of the affected) and 8 females (23.5%) were affected. Among the 52 patients with IDDM, 15 (28.8%) were affected and only 19 (12.8%) from the remainder with NIDDM affected. The peak age incidence was found to be in the fourth decade (30-40 y). The predilection site of the lesions appeared to be the groin was 100%. The extensive or generalized form was found only in 3 (8.8%) patients and the least affected site was the toe webs only in 2 (5.9%). The presentation of the patients was found to be asymptomatic in 22 (64.7%), and the color change (red-brown) was found in all of the patients. In the conclusion, the occurrence of Erythrasma in diabetic patients is more frequent than its occurrence in non-diabetic patients. There is a significant association between the occurrence of Erythrasma and the IDDM. The frequency of occurrence of Erythrasma increase with the long duration of DM and more with the uncontrolled DM.

Keywords: Erythrasma; Dermatology; Corynebacterium Minutissimum; NIDDM; IDDM

Correspondence to: Raisan Mahdi D Al-Obaidi, Misan Health Directorate, Ministry of Health/Environment, Misan, Iraq; E-mail: medicalresearch64@yahoo.com

Citation: Al-Obaidi RMD, Khallaf SA (2021) Clinical Study of Erythrasma in Diabetic Patients. Prensa Med Argent, Volume 107:2. 320. DOI: https://doi.org/10.47275/0032-745X-320.

Received: December 16, 2020; **Accepted:** December 30, 2020; **Published:** January 04, 2021

Introduction

Erythrasma is a mild chronic localized superficial infection of the skin caused by a closely related aerobic coryne form bacteria usually knows as Corynebacterium minutissimum [1]. It is more prevalent in humid and warm climates and characterized by a half-moon shaped plaque uniformly brown and scaly and has no advancing border [2,3]. Erythrasma can occur at any age but its commoner among adults than children with the peak incidence is in early adult life, males and commonly affected more than females [1,4]. Erythrasma as detected by woods light examination. Involve the toe clefts more frequently than any other site. As clinically manifested lesions, they occur most commonly in the groin.

Diabetes mellitus has been cited as a predisposing condition for Erythrasma. The presence of hyperglycemia which impairs leucocyte function makes the infection more severe in diabetes [5]. Usually, diabetic patients with Erythrasma are of adult type (NIDDM) and after undiagnosed or inadequately controlled, thus inadequate treatment may be of etiological impotent is the development of Erythrasma. Erythrasma rarely present is the Juvenile or insulin-dependent diabetes mellitus (IDDM) [6].

Erythrasma responds well to a wide variety of systemic and topical antimicrobial agents [7-9].

Methods

A cross-sectional and case-control combined study of 200 diabetic and 160 nondiabetic control patients visiting the outpatient clinic of the Department of Dermatology, from the period of December 2019 to July 2020 (Table 1 to Table 4).

Wood's Lamp Examination

The invisible long-wave ultraviolet radiation (365 nm) produced by a wood's lamp is used to induce visible fluorescence to make help

Table 1: The control group was examined and was affected by Erythrasma.

Control group examined	Male	Female	No. of affected	%	Male	Female
					No. (%)	
160	120	40	12	7.5	8 (75)	4 (25)

Table 2: Age incidence of the control group (n=12).

Age (years)	No.	%
10 - 20	-	-
20 - 30	1	8.3
30 - 40	7	58.3
40 - 50	3	25
50 - 60	1	8.3

Table 3: Site of predilection.

Site	No.	%
Generalized	-	-
Groin	12	100
Axilla	2	16.7
Toe web	-	-
Others	-	-

Table 4: The presentation of the affected patients.

Presentation	No.	%
Asymptomatic	12	100
Mild itching	-	-
Moderate itching	-	-
Discoloration (red-brown)	12	100
Others	-	-

a diagnosis. Wood's light is produced by filtering the UV light source with barium silicate glass containing approximately 9% nickel oxide [10]. The fluorescence technique with wood's light has been used as a preventive measure to monitor and quantify skin protection at the workplace in high-risk occupations [11].

Laboratory Investigation

Gram stain of the scales showed gram-positive rod-like organisms in long, and filaments. The scales are collected by pressing small pieces of scotch tape (about 4cm × 2cm). On to the lesion and following withdrawal, the ferulaceous scales will remain on the glue side. These pieces are then immersed for some minutes in lactophenol cotton blue stain. Following absorption of the stain, the scales are washed in current water to remove the excess of blue stain, dried with filter paper dehydrated via a passage in two bottles containing absolute alcohol, and then placed in xylene in centrifugation tube, the xylene dissolves the scotch tape glue and the scales fall free in the tube. After centrifugation and decantation, the scales concentrated on the bottom of the tube are collected with a platinum loop placed in Canada balsam on a microscopy slide and closed with a coverslip, the preparation is then ready to be examined [12].

Another procedure to strip the epidermis with cyanoacrylate on a glass slide with permit easier handling and examination [13].

Culture

Medium containing 20% fetal bovine serum, 78% tissue culture media No.199 in 2% sugar, and 0.05% tris. PH 6.8-7.2, the culture on the media yields growth which occurs as small shiny moist whitish-grey translucent colonies which fluoresce coral red under wood's light [14].

Histopathology

Light and electron microscopy examination of the skin biopsy specimen from the affected area showed numerous bacteria in the superficial stratum corneum. So, unless the C. minutissimum is detected the histopathology is not diagnostic, also there is a minimal inflammatory reaction [15].

Statistical Analysis

Results

Erythrasma presented in 17% of diabetic patients. The affected males were (76.5%), while females were (23.5%), and the M: F ratio was 3.23:1. While among non-diabetic volunteers were 7.5%, 8 males (75%) and 4 females (25%). Those findings were significant differences (P = 0.007) (Table 5).

Among NIDDM, 19(12.8%) patients were affected by Erythrasma, while 15(28.8%) IDDM patients were affected, with significant differences (P = 0.008) (Table 6).

There were 18(52.9%) of the affected patients had DM of >5 years duration, while 12(35.3%) had a duration of <5 years, and 4(11.8%) were newly diagnosed (Table 7).

There were 20(58.8%) of the affected with Erythrasma had the criteria of uncontrolled DM. While the 14(41.2%) fulfilled the criteria of controlled DM, which was statistically significant differences (P=0.00002) (Table 8).

The peak age incidence was recorded in the fourth decade (30-40 years) of 29.4% of patients (Table 9).

Erythrasma was generalized or extensive in 3(8.8%) patients. The groin was affected in all the patients followed by the axilla (29.4%) and the least affected was the toe webs (5.9%) (Table 10).

The asymptomatic presentation had appeared in 22(64.7%), while the mild to moderate itching presented in (23.5%-11.8%). Discoloration of brown-red color was presented in all the affected patients (Table 11).

Table 5: The Erythrasma of diabetic patients examined (n=200).

No.	**%**	**Male**	**Female**	***P*-value**
		No. (%)		
34	17	26 (76.5)	8 (23.5)	0.007

Table 6: The type of DM associated with the affected patients.

Type of DM	**No.**	**No. (affected)**	**%**	**Male**	**Female**	***P*-value**
				No. (%)		
NIDDM	148	19	12.8	12 (63.2)	7 (36.8)	0.008
IDDM	52	15	28.8	14 (93.3)	1 (6.7)	

Table 7: Duration of DM and the patients affected.

Duration	No.	%
More than 5 years	18	52.9
Less than 5 years	12	35.3
Newly diagnosed	4	11.8
Total	34	

Table 8: The state of DM and the percentage of patients affected.

State of DM	No.	%	P-value
Uncontrolled	20	58.8	0.00002
Controlled	14	41.2	

Table 9: Age incidence of Erythrasma in diabetic patients (n=34).

Age (years)	No.	%
10 – 19	3	8.8
20 – 29	6	17.6
30 – 39	10	29.4
40 – 49	7	20.6
50 – 59	8	23.6

Table 10: The predilection site of the lesions.

Site	No.	%
Generalized	3	8.8
Groin	34	100
Axilla	10	29.4
Toe web	2	5.9

Table 11: Presentation of affected patients.

Presentation	No.	%
Asymptomatic	22	64.7
Mild itching	8	23.5
Moderate itching	4	11.8
Discoloration (red-brown)	34	100

Discussion

There is a high prevalence of Erythrasma among diabetic patients and at the same time not denying the importance of other predisposing factors like heat, humidity, obesity, maceration, and poor hygiene.

Despite the findings above, the patients affected by extensive (generalized) Erythrasma were low and in most cases, the Erythrasma appeared to be localized to one site and/or another. These findings suggested that DM is not only the factor that determines the extent of Erythrasma and other factors mentioned above may contribute.

The younger age group of those patients with more physical activities and the high exposure to the predisposing factors, and probably the difficult treatment (insulin injection) and inadequate control of DM. Also, there was a significant association between Erythrasma affection and the state of DM (high prevalence in an uncontrolled group of patients), this may support that the hyperglycaemic state found in those patients impair the leucocyte function and make the patient more susceptible to the infection and in turn make the infection more severe and hence we found that all the extensive form of infection was in the uncontrolled group of patients.

The peak age of incidence was found to be in the fourth decade and this also may reflect probably the more exposure of those active age group to the predisposing factors.

The male predominance of the disease may indicate the higher physical activity and these make the male exposed to the common protective factors especially sweating friction and maceration which are aggravated by the hot humid environment of our living place.

Regarding the site of Erythrasma, the groin was involved in all the cases and this may explain that this area is more subjected to sweating and friction aggravated by the type of clothing and the environment.

The controversial result of toe web infection (least side affected) may reflect that the foot of most of our patients was uncovered and those mostly used open shoes or another simple footwear (sandal).

Most patients were asymptomatic and this supports the previous finding that Erythrasma is a superficial asymptomatic infection of the skin and may only cause slight irritation and itching.

Conclusions

The occurrence of Erythrasma in diabetic patients is more frequent than its occurrence in non-diabetic patients. There is a significant association between the occurrence of Erythrasma and the IDDM. The frequency of occurrence of Erythrasma increase with the long duration of DM and more with the uncontrolled DM.

References

1. Sariguzel FM, Koc AN, Yagmur G, Berk E (2014) Interdigital foot infections: Corynebacterium minutissimum and agents of superficial mycoses. Braz J Microbiol 45: 781-784. https://doi.org/10.1590/S1517-83822014000300003
2. Badri T, Sliti N, Benmously R, Hammami H, Ben Jennet S, et al. (2014) Erythrasma: study of 16 cases. Tunis Med 92: 245-248.
3. Rosen T, Fry L, Wojnarowska F, Shahrad P (1985) The illustrated encyclopedia of dermatology. (2nd edtn), Medical Economics Books, New Jersey, United States.
4. Machine RM (1983) Clinical dermatology: An illustrated textbook. Oxford Medical Publication, United Kingdom.
5. Aboud CF (1996) ABIM certifying examination on internal medicine 1996. Diabetes Mellitus 180-186.
6. Laurance DR, Bennett PN (1992) Clinical pharmacology. (7th edtn), ELBS.
7. Holdiness MR (2002) Management of cutaneous erythrasma. Drugs 62: 1131-1141. https://doi.org/10.2165/00003495-200262080-00002
8. Abou YZ, Alwan AAS (1993) Guide to chemotherapy and chemoprophylaxis in bacterial infections. World Health Organization, Switzerland.
9. Greywal T, Cohen PR (2017) Erythrasma: A report of nine men successfully managed with mupirocin 2% ointment monotherapy. Dermatol Online J 23: 10.
10. Wigger-Alberti W, Elsner P (1997) Fluorescence with Wood's light. Current applications in dermatologic diagnosis, therapy follow-up and prevention. Hautarzt 48: 523-537. https://doi.org/10.1007/s001050050622
11. Padilha-Gonclaves A (1996) A single method to stain Malassezia furfur and C. minutissimum in scales. Rev Inst Med Trop Sao Paulo 38: 299-302. https://doi.org/10.1590/S0036-46651996000400011
12. Findlay GH (1987) The dermatology of bacterial infection. Blackwell Scientific Publications, United Kingdom.
13. Dunn C, Applebaum DS, Dao H (2018) Widespread hyperpigmented rash present for 1 year. JAAD Case Rep 4: 743-745. https://doi.org/10.1016/j.jdcr.2018.04.012
14. Torres-Navarro I (2018) Eritrasma. Ago Emergencias 30: 283.
15. Groves JB, Nassereddin A, Freeman AM (2020) Erythrasma. StatPearls Publishing, Florida, United States.