

Full Length Research Paper

Clinico-mycological profile of superficial mycosis and the relationship Of ABO blood grouping with superficial mycosis

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A total of 456 clinically diagnosed cases (170 male and 286 female) of superficial mycosis was conducted. Highest incidence of cutaneous candidiasis followed by pityriasis versicolor was found. The maximum incidence of superficial mycosis was found in adult females with cutaneous candidiasis then pityriasis versicolor in both sexes (females 83 and males 80). In this study, the most common isolate was *Trichophyton mentagrophytes* (24.3%) of all dermatophyte infections, and 8.5% of the total cases of superficial mycosis. The authors investigated the relationships between cutaneous mycosis and ABO blood groups, through blood typing, clinical and mycological diagnosis with identification of isolated dermatophytes. They concluded that *T. mentagrophytes* was isolated from 53.8% of the patients belonging to blood group A, 33.8% to group O and 15.3% to group B. *Epidermophyton floccosum* was seen in 23.4% group A, 65.3% group O and 14.2% group B. *Trichophyton tonsurans* was found in 41% belonging to group A, 43.7% to group O and 13.2% group B. *Trichophyton rubrum* was found in 40% for each patient with blood group A and O, while 20% for patients with blood group B. The relationship of cutaneous candidiasis with blood group O was found to be 45.8%, group A 34.1%, group B 18.9% and only 1.2% for blood group AB, while in pityriasis versicolor, blood group O was found in 74% of the cases, group A in 13.9%, group B in 10.7% and group AB was found in only 1.4% of the cases of pityriasis versicolor. The main age group affected was 21-30 years (59 cases) (male 28 cases and females 31 cases) out of 136 total cases of pityriasis versicolor. Even though the authors have found a higher number of patients belonging to blood group O infected with *E. floccosum*, these results suggested that there is statistical evidence ($P > 0.001$) that these individuals are more susceptible to superficial mycosis.

Key words: Blood groups, dermatophytes, superficial mycosis.

INTRODUCTION

Superficial mycosis refers to the diseases of the skin that are caused by fungi and exclusively invasive of the inte-

gumentary tissue. Among this group, dermatophytosis, pityriasis versicolor and candidiasis occur most frequently.

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They possess the affinity for parasitizing the horny layer of the skin as well as other structures rich in keratin, such as hair and nails (Hainer, 2003; Padhye and Summerbell, 2005; Decorby et al., 2009; Ameen, 2010; Grumbtand et al., 2011; Sahai and Mishra, 2011). They produce a dermal inflammatory response with intense itching and also cause cosmetic disfiguration. Dermatophyte infections are caused by three genus: *Trichophyton*, *Microsporum* and *Epidermophyton* with morphological, physiological and antigenic characteristics that relate them to each other (Azulay, 1985).

Studies involving cell wall of dermatophytes have demonstrated that the fungus *Trichophyton mentagrophytes*, *Trichophyton rubrum* and *Epidermophyton floccosum* have glycoproteins that are antigenically similar to human erythrocyte isoantigen A (Young and Roth, 1979). According to the authors, individuals that have these erythrocytic antigens would be more susceptible to development of generalized dermatophytosis and resistant to treatment than the individuals devoid of these antigens.

Upon investigation of this premise (Balajee et al., 1996) high incidence of dermatophytosis infected individuals belonging to blood group A, and from those 89.9% presented chronic dermatophytosis with persistent lesions for more than five years was found. Similarly Gamborg-Nielsen (1994) verified higher incidence of individuals belonging to this blood group and infected with the fungus *Trichophyton mentagrophytes*. Contrary to this data, Neering (1979) could not demonstrate any relationship between blood group and dermatophytes infection.

In the face of these results and considering the lack of studies on this subject in our country, the aim of the present work was to identify the clinical pattern of superficial mycosis and to identify the most common pathogens responsible for superficial mycosis in patients attending dermatological clinic with the possible relationship through the identification of the dermatophyte isolated, cutaneous candidiasis and pityriasis versicolor cases and blood groups.

MATERIALS AND METHODS

This study was conducted in the Department of Dermatology and Venereology in Mirjan Teaching Hospital during the period of January 2012 to December 2013 on 456 patients: 170 male, 286 female with all age groups. Hair and all scrapings were taken for KOH examination, nail clipping in KOH solution overnight then examination was performed under the microscope. KOH positive specimen was proceeded for culture. Pityriasis versicolour cases were subjected to KOH examination only as pityrosporum is a normal skin flora so culture was not done. If any growth was found on Sabouraud's dextrose agar medium, colonial morphology (grossly and microscopically), pigment production were further observed. Blood samples were sent to hospital laboratory for typing of blood groups. Qi square test was used in statistical analysis for determination of the significance differences between ABO blood group of normal people and patients with cutaneous mycoses.

RESULTS

Among the 456 cases observed, 170 were males and 286 females. Most of the clinically diagnosed cases were KOH positive and some scrapings failed to grow in culture even when they were KOH positive. The highest incidence of superficial mycosis was found in the month of August (85 cases) and the lowest incidence in April (13 cases) in the age group of 15-35 years. The maximum incidence among superficial mycosis was pityriasis versicolor, 163 cases (females 83, males 80) followed by cutaneous candidiasis, 133 cases (106 female and 27 male). Chronic wide spread skin rash of pityriasis versicolor was found in 39 males and 30 females. The main age group affected was 21-30 years, 59 cases (male 28 cases and females 31 cases). The maximum incidence of cutaneous candidiasis (especially candidal intertrigo) was found in adult females (72 female) with candidiasis of external genitalia and groin (36 females and 2 males), candidal vulvovaginitis was found in 6 pregnant females, candidal napkin rash in 22 children and candidal intertrigo of the neck was found in only 12 infants. 9 cases of oral thrush was reported and candidiasis involving skin under breast and axilla was also reported in 19 females (Table 1).

It was noticed that the most common presentation was cutaneous candidiasis which is accounted by 39.2% of the total cases, the second most common presentation was pityriasis versicolor with over all incidence of 35.7% of the total cases. Tinea corporis occupied the third position, 23.75% of the dermatophytes infections, and 8.3% of the total cases, then Tinea cruris accounted for 21.25% of the dermatophytes infections and 7.3% of the total cases (Table 2). Infections occurring in multiple sites simultaneously were also very common (20%).

In the present study, the most common isolates was *T. mentagrophytes* which accounted for 24.3% of the dermatophyte infections, and 8.5% of the total cases of the superficial mycosis (Table 2). The relationship between blood groups and isolated dermatophytes is reported in (Table 3). The fungus *T. mentagrophytes* was isolated from 53.8% of the patients belonging to blood group A, and 33.8% to group O and 15.3% to group B; in *E. floccosum*, 23.4% group A, 65.3% group O and 14.2% group B. *Trichophyton tonsurans* was found in 41% of the patients belonging to group A and 43.7% to group O and 13.2% group B. While *T. rubrum* was found in 40% of the patients belonging to blood group A, 40% belonging to blood group O and 20% to group B. (Table 4)

The incidence of blood groups in the normal healthy population studied in 600 individuals is as follows: group A seen in 22.8% (137), group O 27% (162), group AB 24.5% (147) and group B 25.7% (154). There is a significant statistical difference between the cases of *T. mentagrophytes*, cutaneous candidiasis ($P < 0.001$) and *T. tonsurans* ($P < 0.01$) with the normal healthy people. In *T. rubrum*, *Trichophyton verrocosum* and *Microsporum canis*, there was no significant statistical difference

Table 1. Incidence of superficial mycoses in relation to the gender.

Candidal infections (total no.133)	Female (total no.106)	Male (total no. 27)
Candidal intertrigo	17	7
Candidiasis under breast, axilla	19	0
Candidiasis (groin, genitalia)	36	2
Candidal intertrigo of neck (infants)	8	4
Candidal vulvovaginitis (pregnant)	6	0
Candidal napkin rash	14	11
Oral thrush	6	3
Other superficial Mycosis	Female (no. 83)	Male (no. 80)
Pityriasis versicolor (No.163)	39	30

Table 2. Distribution of the patients with dermatophytes infection according to the area affected with relation to the gender.

Types of dermatophytes	Male no. 63	Female no. 97	Total no. 160	%
Tinea corporis	32	6	38	23.75
Tinea capitis	5	7	12	7.5
Tinea pedis	6	3	9	5.6
Tinea unguium	1	12	13	8.1
Tinea manuum	2	14	16	10
Tinea cruris	16	18	34	21.25
Tinea faciei	1	5	6	3.75
Combination of more than one type	14	18	32	20

Table 3. Total frequency of dermatophyte species isolated from cultures of clinical samples based on the patients' sex.

Type	N (%)	Female (%)	Male (%)
<i>T. mentagrophytes</i>	59(36.8)	43(44.3)	16(25.4%)
<i>T. tonsurans</i>	39(24.3)	17(17.5)	22(34.9)
<i>T. rubrum</i>	5(3.1)	3(3.1)	2(3.2)
<i>T. verrucosum</i>	7(4.3)	4(4.1)	3(4.8)
<i>E. floccosum</i>	49(30.0)	29(29.9)	20(31.7)
<i>M. canis</i>	1(0.6)	1(1.0)	-
Total	160(100)	97(100)	63(100)

between these cases and the normal control ($P > 0.05$). In *E. floccosum* there was a significant statistical difference between the cases of normal people ($P > 0.001$).

The relation of cutaneous candidiasis with blood grouping (No. 86), group O was found in 61/86 (70.9%), group A in 24/86 (27.9%), group B in 9/86 (10.4%) and blood group AB was found in only 1/86 (1.1%) while in pityriasis versicolor (No. 119), blood group O was found

in 77/ 119 (64.7%) of the cases, group A in 23/119 (19.3%), group B in 17/119 (14.2%) and group AB was found in only 2/119 (1.6%).

DISCUSSION

Several researchers have studied the relationship between blood group and infectious diseases. In Hansen's

Table 4. Blood group results according to species of isolated dermatophytes.

Type	Group A no. (%)	Group O no. (%)	Group B no. (%)
<i>T. mentagrophytes</i>	30(53.8%)	20(33.8%)	9(15.3%)
<i>T. tonsurans</i>	16(41%)	19(43.7%)	4(13.2%)
<i>T. rubrum</i>	2((40%)	2(40%)	1(20%)
<i>T. verrucosum</i>	3((42.8%)	4(57.1%)	0
<i>E. floccosum</i>	10(23.4%)	32(65.3%)	7(14.2%)
<i>M. canis</i>	0	1(100%)	0

disease, Beiguelman (1963) verified that the frequency of individuals of blood group O was higher in patients with tubercloid clinical form when compared with the lepromatous form. In coccidioidomycosis, Deresinski (1979) observed higher prevalence of the disease in individuals from group B. In a way, their studies suggested that individuals belonging to this blood group, present Gram negative infections with higher frequency than individuals belonging to the remaining blood groups (Foster and Lobrum, 1976; Robinson et al., 1971; Socha and Kaczera, 1969). 40.9% of the patients with recurrent furunculosis (caused by *S. aureus*) had blood group O followed by 22.7% having blood group B (Al-Khafajii, 2014).

In dermatophytosis Young and Roth (1979) observed antigenic similarities between *T. rubrum*, *T. mentagrophyte* and *E. floccosum* cell wall glycoprotein and A1 and A2 human erythrocyte isoantigens, suggested that possible cross reactivity would turn individual belonging to blood group A more susceptible to chronic dermatophyte infections.

In the present work we found that comparison with the incidence of blood groups in the normal population studied in 600 individuals is as follows: group A seen in 22.8% (137), group O 27% (162), group AB 24.5% (147), and group B 25.7% (154). There is a significant statistical difference between the cases of *T. mentagrophytes* and cutaneous candidiasis in comparison with healthy population ($P < 0.001$), in *T. tonsurans* the P value was $P < 0.01$. This suggests that there is a higher susceptibility of individuals with group O and A to different dermatophyte infections including *T. mentagrophytes*, *T. tonsurans*, *E. floccosum*, cutaneous candidiasis and pityriasis versicolor. So this result is similar to the study of Young and Roth (1979) that demonstrated that blood group active glycoprotein is found in *T. mentagrophytes* and *E. floccosum* which are commonly the cause of chronic infection in human while *M. canis* which does not appear to possess this antigen is seldomly so involved. In *T. rubrum*, *T. verrocosum* and *M. canis*, there is no significant statistical difference between these cases and the normal control ($P > 0.05$), which supports the findings of Neering (1979) that reported no difference in susceptibility of individuals from blood group A to dermatophytosis.

Conclusion

This study concluded that there is statistical evidence indicating that individuals with blood group O and A are more susceptible to superficial mycosis.

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