

Fungal Dermal Infections and its Relationship with some Variables in Baghdad City

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الخلاصة

اجري هذا البحث في مدينة بغداد ووجد ان عامل المستوى الاجتماعي والثقافي يؤدي دورا مهما في الاصابة بالفطريات الجلدية. ان الغاية من هذه الدراسة هو تحديد نسبة الاصابة بالفطريات الجلدية للفئات العمرية (14-40سنة) و(41- فما فوق) من كلا الجنسين خلال شهري شباط للعامين 2005 و2008 في محافظة بغداد، فكانت بنسبة 74,5% لعام 2005 وبنسبة 85,9% لعام 2008. تبين من هذه الدراسة ان الخميرة *Candida albicans* هي من اكثر الفطريات اصابة في الفئات العمرية حيث بلغت نسبة الاصابة به (5، 64%) في عام 2005 وبنسبة (3، 66%) في عام 2008 ، وكانت نسبة الاصابة في الفئة العمرية(14-40سنة) اعلى مما في الفئة العمرية (41- فما فوق) وفي الاناث اكثر منها في الذكور في العامين 2005 و 2008 .

ABSTRACT

This research carried out in Baghdad has shown that social and educational situation of individuals is an important cause in the prevalence of dermal infections.

The objectives of current study were to determine their prevalence of age category(14-40 year) and (41-above) for male and female during the month February of 2005 with comparing in the same variables for the year 2008 in Baghdad city,It was 74.5% in the year 2005 and 85.9% in the year 2008. This study found that in this populations,the yeast *Candida albicans* was the most frequent dermal infections (64.5%)in the year 2005 and (66.3%) in 2008.The prevalence of infection in age category(14-40year)was highest than that in category (41-above), and in females is more than males for the years 2005 and 2008.

INTRODUCTION

Various germs such as fungi and bacteria live harmlessly on the skin and inside the body. However certain types of fungus , or overgrowth of normally harmless types can cause the symptoms of a fungal infection of the skin. Most fungal skin conditions are not serious and are usually not easily spread from person to person. Infections deeper in the body can be more serious(1).

Dermatophytes are the most common cause of fungal infections worldwide and impact millions of individuals annually, and responsible for a variety of skin infections at body locations including the feet, torso, scalp and nails. The fungus can be asymptomatic, can cause a chronic infection(most common)or can have an acute onset phase associated with inflammation(2).

Dermatophytes thrive by growing on surface of skin that has a high percentage of moisture resulting from sweat secretion especially on areas of skin folds among toes, thighs, armpit, and areas where there is hair in head and body for containing keratin that is a good nutrient for it(1,3). The dermatophytes can cause chronic infections in healthy, immune-competent individuals such as those having malignant tumors, who take immune suppressive drugs and evade and maintain control of the host immune response for extended periods of time(4).

Generally, the development of fungi infections is related to several factors including immuno status of the agent, environmental factors surrounding the agent such as heat and moisture, and the kind of fungi causing infection, as well as other factors(5).

MATERIALS AND METHODS

Collection and Examination

The sample size included patients aged (14-40 year) and (41-above)who were attending the Central Laboratories of general health in Baghdad city, was 102 dermal samples in February 2005, and 128 dermal samples in February 2008, the samples were collected from skin, hair and nail. The infected areas were first sterilized with medical alcohol (70%). Skin samples were collected by scraping using sterilized scalpel, while hair samples were uprooted from the patients, nail scissors needs primary softening in test tubes containing potassium hydroxide(KOH)20% before coming to microscopy. A portion of the sample was placed on a slide and 50µl of KOH was added. After 5minutes, the wet preparation was examined for the presence of fungal elements and their diagnostic morphology. All samples were cultured on Sabouraud.

Chloramphenicol Cycloheximide Agar(SCCA)and Sabouraud Gentamicin Chloramphenicol Agar(SGCA). The plates were inoculated with finely divided pieces from the samples and incubated at 25c or 30c for up to 4 weeks. The plates were examined twice weekly for evidence of growth. Fungal isolates were then subcultured onto Sabouraud and Potato dextrose agar in Petri dishes(1).

Diagnosis

Isolated kinds were diagnosed depending on the color and shape of growing colonies, the color of cultured plate back, and the nature of colonies

and other tests. They were put on a sterilized glass slide, and adding 1 or 2 drops of lactophenol solution, then covering the sample with cover slide. Under light microscope, there were macro or microconidia and

other structure diagnosed according to classification keys mentioned by (6).

RESULTS AND DISCUSSION

In this study, a total of 102 samples in February 2005 and 128 samples in February 2008 were obtained from patients with suspected superficial mycosis. Diagnosis was confirmed by microscopic examination , 74.5%(76 cases) in 2005 and 85.9%(110 cases) in 2008. From the total isolates identified by culture growth ,fungal species of nail were the most common, especially *Candida albicans* .

The frequency of *C.albicans* infections among patients were 64.4%(49case) in the year 2005 and 66.3%(73case) in the year 2008(table 1).

Table -1 :The Number and Ratio of fungal dermal infections in Baghdad at Feb.of 2005 and 2008

Swab area	Test isolate	No. and % of cases in 2005	No. and % of cases in 2008
Skin	<i>Trichophyton werneckii</i>	3 (3.9%)	5(4.5%)
	<i>Microsporum canis</i>	1(1.3%)	3(2.7%)
	<i>Alternaria sp.</i>	2(2.6%)	1(0.9%)
Hair	<i>T.mentagrophytes</i>	8(10.5%)	12(10.9%)
	<i>Aspergillus sp.</i>	1(1.3%)	3(2.7%)
Nail	<i>T.schoenleninii</i>	8(10.5%)	8(7.2%)
	<i>Candida albicans</i>	49(64.4%)	73(66.3%)
	<i>C.guilliermondii</i>	3(3.9%)	4(3.6%)
	<i>T.rubrum</i>	1(1.3%)	1(0.9%)
Total and Ratio		76(61.8%)	110(85.9%)

The total examined cases =102 in 2005,and =128 in 2008

Demographic factors associated with high positive rates (> or =20%) of the infection were familial (7).

Unlike other fungi, dermatophytes are communicable and cause infections in healthy, immune-competent individuals as well as in those with immune dysfunction(8). Fungal infections and scabies were the most common skin disease in Nigeria(9)Estimates suggest that 30 to 70% of adults are asymptomatic carriers of these fungi and approximately one third of the cultures from nail specimens yielded pure growths of nondermatophyte moulds or *C.albicans* (10).In Rome, the dermatophyte most frequently isolated was *Microsporum canis* between 2002-2004(11).Sixty percent of cases(937case) were asymptomatic, indicating a carrier state. Race,scaling, and the use of improper cleaning solutions(detergents) were associated with increased likelihood of infection(12).

C.albicans is common in persons whose hands are immersed in water for a long time, and in housewives, cooks and persons dealing with fish and vegetables, therefore we found that the high percentage of infection was in females more than males in the year 2005(table 2),and in the year 2008(table 3)

Table-2: The relation between fungal dermal infections and the variables age and sex in the year 2005

Test isolate	Age 14-40		Age 41-above		Total
	Female	Male	Female	Male	
<i>Trichophyton werneckii</i>	1	1	1	0	3
<i>Microsporum canis</i>	1	0	0	0	1
<i>Alternaria sp.</i>	1	1	0	0	2
<i>T.mentagrophytes</i>	2	2	2	2	8
<i>Aspergillus sp.</i>	1	0	0	0	1
<i>T.schoenleninii</i>	2	2	2	2	8
<i>Candida albicans</i>	33	8	6	2	49
<i>C.guilliermondii</i>	1	1	1	0	3
<i>T.rubrum</i>	1	0	0	0	1
Total	43	15	12	6	76
Ratio	56.5%	19.7%	15.7%	7.9%	61.8%

Table-3: The relation between fungal dermal infections and the variables age and sex in the year 2008

Test isolate	Age 14-40		Age 41- above		Total
	Female	Male	Female	Male	
<i>Trichophyton werneckii</i>	3	0	2	0	5
<i>Microsporum canis</i>	1	1	0	1	3
<i>Alternaria sp.</i>	0	1	0	0	1
<i>T.mentagrophytes</i>	5	2	4	1	12
<i>Aspergillus sp.</i>	2	0	1	0	3
<i>T.schoenleninii</i>	2	2	4	0	8
<i>Candida albicans</i>	42	14	12	5	73
<i>C.guilliermondii</i>	2	1	1	0	4
<i>T.rubrum</i>	1	0	0	0	1
Total	58	21	24	7	110
Ratio	52.7%	19.0%	21.8%	6.3%	85.9%

Among them it was observed that the yeast *C.albicans* was the higher prevalence ,it exists with little quantities in healthy persons' skin, but it soon occupies damaged skin and areas of intertriginous sites causing infections to those area, *C.* requires moisture(13). This type of yeasts is not pathogenic, but when there is a change in cellular immunity of the agent, the infection occurs(14).The infection was found to occur more frequently in females in age group(14-40 year) 56.5%(43 case)in 2005 and 52.7%(58 case) in 2008. This finding concurred with other studies which found that cutaneous candidosis may be as common as dermatophytes, particularly in females,this may be due to the fact that females usually harbor *C.albicans* vaginally or glabrous skin(1),and with the study which found that fungal infections are associated with specific age groups(teenagers as they reach puberty,young adults,and the elderly)(15). *Trichophyton unguium* infection of finger nails in females were most common manifestations of dermatophytosis in Addis Ababa(16). Epidemiological research has shown that the social and educational level of individual is an important cause in the prevalence of fungal dermal infection (table 4,5).

Table-4: The effect of educational level of patients on infection ratio with fungal dermal pathogens in 2005

Educational level of patient	Number of infections	Ratio of infection
Uneducated	39	38.2%
Educated(without license)	16	15.6%
Primary school	9	8.8%
Secondary school	8	7.8%
Institute or college	4	3.9%
Total	76	74.5%

Table-5: The effect of educational level of patients on infection ratio with fungal dermal pathogens in 2008

Educational level of patient	Number of infections	Ratio of infection
Uneducated	52	40.6%
Educated(without license)	16	12.5%
Primary school	20	15.6%
Secondary school	13	10.1%
Institute or college	9	7.0%
Total	110	85.9%

Despite the prominence of fungal dermal infection and their resulting economic consequences, the research and medical communities lack a sophisticated understanding of these organisms' biology and consequently effective preventatives and therapeutics. These deficiencies in large part are due to the lack of genetic tools to enable the study of these fungi and their host-specificities(3). Fungal infection of the nails, effects quantity of life including physical and social functioning and emotional health(17).

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