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Superficial Fungal Skin Infections in Patients Attending Zliten Teaching Hospital (North West of Libya)

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Authors' contributions

This work was carried out in collaboration between all authors. Author TMA did the study design and wrote the protocol. Authors TMA, HAR, SSA and MAA wrote the first draft of manuscript. Authors TMA, AMAB and MMMA did the statistical analysis, literature searches and analyses of study. All authors read and approved the final manuscript.

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Original Research Article

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ABSTRACT

Aims: This study was carried out to know the frequency of occurrence of different clinical types of dermatophytosis and Pityriasis versicolor and its distribution among different age groups and sexes and also, in particular groups of patients, who attended dermatology clinic of Zliten Teaching Hospital in Zliten (North west of Libya).
Study Design: A retrospective study was carried out to analyze the data to find out the distribution pattern of different clinical types of Superficial fungal infection (SFI) in relation to age and sex.

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Place and Duration of Study: The study was carried out for a period of 9 Months, between October 2014 and June 2015. All patients with various skin complaints (3303) were examined for the presence of SFI at outpatient Department of Zliten Teaching Hospital in Zliten, Libya.
Methodology: Wood's lamp examination was performed on patients with suspected SFI. Also, skin scrapings; nail clippings and infected hair samples were examined for fungal elements in 20% KOH mount under high power of microscope. A definitive diagnosis was based on the cultural characteristics, Lacto phenol cotton blue (LPCB) preparation of the fungal growth and some biochemical tests.
Results: A total of 161(4.9%) of 3303 patients were found to be suffering from SFI. The majority of these patients 37(22.9%) were of less than 7 years of age, followed by age group from 21-27 years 24(14.9%). Male to female ratio was 1.2:1. The most frequent clinical pattern was, Tinea capitis in 41 patients (represented 25.5%), followed by Tinea pedis in 36 patients (22.4%), Tinea corporis in 35 patients (21.7%) and Pityriasis versicolor in 30 patients (18.6%).
Conclusion: The majority of patients, 113(70.2%) were in the younger age groups (less than 35 years old). Tinea capitis was the most frequent superficial fungal infection under 14 years of age, and Pityriasis versicolor was the most frequent fungal infection in the age group 13-20 years.

Keywords: Superficial fungal infection (SFI); dermatophytosis; pityriasis versicolor; tinea capitis.

1. INTRODUCTION

The Fungi are living organisms present in our environment and some fungi are considered to be normal flora such as Malassezia species. However, these organisms can affect humans under certain circumstances and cause disease [1].

SFI of skin and it´s appendages is a common health problem worldwide. Dermatophytosis and Pityriasis versicolor are the main SFI in humans. The risk factors are hot humid environment and contact with animals.

Furthermore, the non-dermatophyte moulds could be a cause of fungal infection of nails (Onychomycosis) [2]. Fungal infections of skin, nails and hairs are one of the most frequent diseases and in the last decades, the prevalence of fungal infections of skin and appendages has increased to affect around 25% of population of different world societies [3]. Marques et al. [4] found that Dermatophyte infections of skin affect one fifth of world´s population.

The SFI are mainly confined to stratum corneum (upper layer of Epidermis) and cornified appendages (hairs and nails) [2]. Dermatophytosis is a group of important superficial fungal infections of skin and its appendages and is caused by three etiologic species of dermatophytes, which are Microsporum, Trichophyton and Epidermophyton, and each type of these three is characterized by specific morphologic features of cultured colonies and of Macroconidia under Microscope. Dermatophyte infections of skin is also known as ringworm infection and named after affected part of the body, e.g. Tinea capitis and Tinea pedis [5]. Symptoms and signs of Dermatophyte infections of skin and its appendages differ according to the affected site of the body and the source of fungi. Generally, skin lesions are scaly well-defined erythematous plaques with active margin showing more scales with or without vesicles and pustules. The lesions tend to extend peripherally and clear centrally. Zoophilic fungi exhibit more inflammation compared to anthropophilic fungi [2]. Another common SFI is Pityriasis versicolor which is mainly caused by Malassezia species, which is yeast, and manifested as round or oval patches (macules) in different colours (white, red and brown) with fine scales [2,6].

The risk factors for SFI are hot, humid climate, which encourages sweating and appearance of fungal infections of skin and furthermore, contact with infected animals, like cats could lead to skin infection of humans with zoophilic fungi [6].

In Libya, few studies were conducted about SFI; furthermore, no previous studies about this issue were performed in Zliten.

2. METHODS AND SUBJECTS

2.1 Area of Study

Zliten is a Libyan city with more than 263,000 people and located on Mediterranean Sea about 150 kilometres east of Tripoli, with hot weather and high humidity in summer months [7]. Zliten

Teaching Hospital is the main hospital in Zliten, with its dermatology outpatient department serves more than 360 outpatient monthly.

2.2 Objectives

This study carried out to discover the frequency of different types of dermatophytosis and Pityriasis versicolor and their distribution according to age and gender, in particular group of patients, who attended dermatology clinic of Zliten Teaching Hospital in Zliten (North west of Libya).

2.3 Methods

The data for all patients was used from retrospective study. All patients who came for dermatological consultation at outpatient Department of Zliten Teaching Hospital were enrolled. The study was carried out during the period from 01.10.2014 to 30.06.2015. All patients belonged to the area of study. Patients were examined with wood´s lamp. Skin scrapings; nail clippings and hair bits were examined under microscope in 20% KOH mount for fungal elements. The final diagnosis of the fungus was based on KOH mount for Pityriasis versicolor and KOH mount and cultural characteristics for dermatophytes. Scrapings were taken with sterile scalpel on a clean glass slide and a drop of 20% potassium hydroxide (KOH) was added and then covered with a glass cover slip and then examined under microscope. For culture purposes, the scraped site was cleaned aseptically with 70% ethanol and specimens were directly collected into sterile petri dishes. The sample was inoculated on Sabouraud's dextrose agar supplemented with chloramphenicol and cycloheximide. The plates were incubated at 26℃ and the growth of cultures was observed twice weekly and petri plates were discarded only after 3 weeks in the absence of growth. In case of growth, LPCB mounts were prepared to study the morphological characteristics, e.g. macroconidia and microconidia and special hyphal characteristics. Also, some biochemical tests were performed as needed.

2.4 Statistical Analysis

The data were analysed with use of SPSS 20 to study the distribution and frequency of superficial fungal infections of skin, hairs and nails.

3. RESULTS

A total of 3303 patients sought medical advice because of skin problems at outpatient Department of Zliten Teaching Hospital. In this study, 161(4.9%) patients were found to have SFI, 88(54.7%) were males and 73(45.3%) were females. The ratio of male to female was 1.2:1. The age of patients ranged from 1 to 80 years (mean, 25.3 years). Of 161 patients, 37(22.9%) of patients were in the age group 0-6 years, followed by age group from 21-27 years, were 24(14.9%). We observed that 58 (36%) of patients with SFI were less than 14 years old (childhood age group). As well as 55 patients (34.2%) were found to be in age groups varying from 14 to 34 years, which represent adolescence and adulthood. The patients in the age groups varying from 35 to 55 years were found to be 39 (24.2%). From above mentioned results, we find out that about 94.4% of patients with superficial fungal infection are less than 56 years old. The frequency of occurrence of superficial fungal infections in different age groups and sex are shown in (Fig. 1 and Table 1).

Tinea capitis was found to be the most common clinical type in children below 7 years of age 25(67.6%). Pityriasis versicolor was seen in 6 patients (46.2%) in age group, 14-20 years.

The most common fungal infection was Tinea capitis 41 (25.5%), followed by Tinea pedis, in 36 patients, which represented 22.4% of total cases of SFI, followed by Tinea corporis in 35 patients (21.7%) and Pityriasis versicolor in 30 patients (18.6%). However, Tinea unguium was found only in 10 patients (6.2%) of total superficial fungal infections. The lowest frequent superficial fungal infection was Tinea manuum only in one patient (0.6%) (Fig. 2).

The patterns of specific types in relation to different age groups were characteristic. Regarding distribution of Tinea capitis in different age groups, children before 13 years old were found to be more susceptible. Adults were rarely to be affected with Tinea capitis.

Changing pattern of frequency and distribution of Tinea capitis in relation to early age groups (childhood and young adults) is given in Fig. 3. Conversely, Pityriasis versicolor was found to occur more frequently between 13 years and 35 years old (Fig. 4). Tinea pedis were more frequent in the age groups from 28 to 55 years (Table 1).

Table 1. The frequency of different superficial fungal infections in 161 patients and their age-wise distribution

Diagnosis	Number (%)													
	Different age groups (years)											Gender		Total number (%) of each clinical type
	0-6	7-13	14-20	21-27	28-34	35-41	42-48	49-55	56-62	63-69	>=70	Male	Female	
Tinea capitis	25 (67.6)	10 (47.6)	4 (30.8)	1 (4.2)	1 (5.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	23 (26.1)	18 (24.7)	41 (25.5)
Tinea faciei	3 (8.1)	0 (0.0)	0 (0.0)	1 (4.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.1)	3 (4.1)	4 (2.5)
Tinea corporis	5 (13.5)	3 (14.3)	3 (23.1)	8 (33.3)	4 (22.2)	4 (33.3)	3 (20)	4 (33.3)	0 (0.0)	0 (0.0)	1 (25)	19 (21.6)	16 (21.9)	35 (21.7)
Tinea manuum	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (5.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.4)	1 (0.6)
Tinea cruris	1 (2.7)	0 (0.0)	0 (0.0)	2 (8.3)	0 (0.0)	1 (8.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.3)	2 (2.7)	4 (2.5)
Tinea pedis	3 (8.1)	2 (9.5)	0 (0.0)	2 (8.3)	4 (22.2)	5 (41.7)	8 (53.3)	6 (50)	3 (75)	1 (100)	2 (50)	22 (13.7)	14 (19.2)	36 (22.4)
Tinea unguium	0 (0.0)	4 (19.1)	0 (0.0)	1 (4.2)	2 (11.1)	0 (0.0)	3 (20)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (3.4)	7 (9.6)	10 (6.2)
Pityriasis versicolor	0 (0.0)	2 (9.5)	6 (46.2)	9 (37.5)	6 (33.3)	2 (16.7)	1 (6.7)	2 (16.7)	1 (25)	0 (0.0)	1 (25)	18 (20.5)	12 (16.4)	30 (18.6)
Total number (%) in each age group	37 (22.9)	21 (13)	13 (8.1)	24 (14.9)	18 (11.2)	12 (7.5)	15 (9.3)	12 (7.5)	4 (2.5)	1 (0.6)	4 (2.5)	88 (54.7)	73 (45.3)	161 (100)

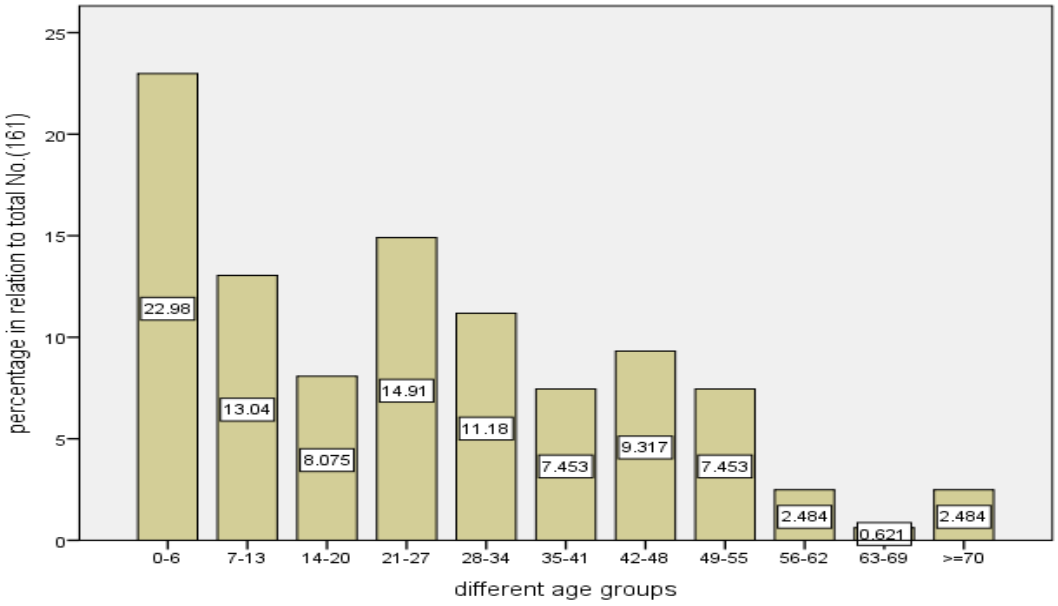

Fig. 1. Graph, representing the frequency of superficial fungal infections in different age groups

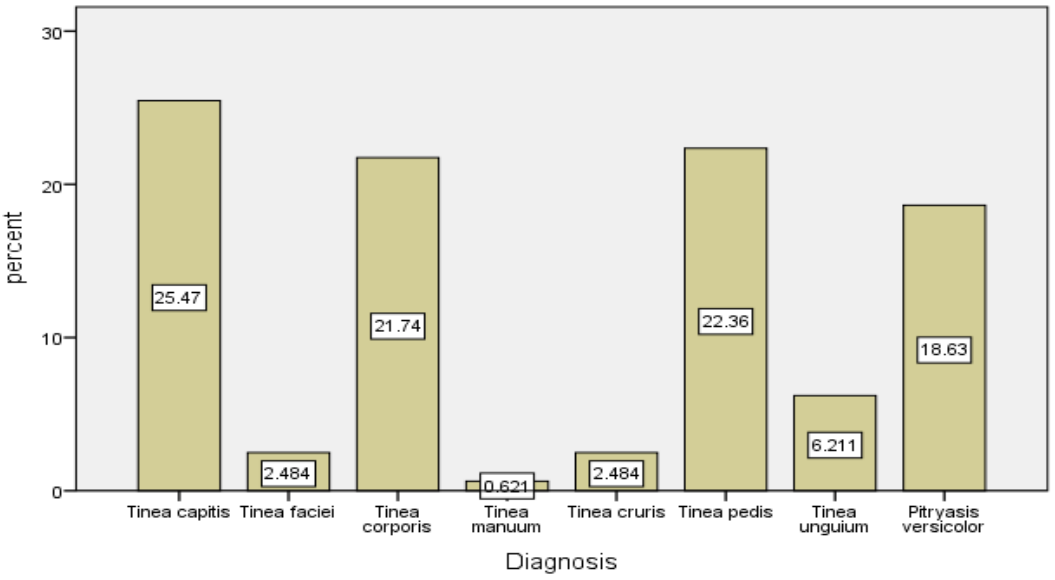

Fig. 2. Frequency of each type of superficial fungal infections

4. DISCUSSION

The real prevalence of superficial mycoses in Libya is not known because of SFI are not noticeable diseases [8].

In this study the mean age of patients with SFI was 25.3 years, which is relatively similar to results of studies conducted in Kosova (30.8) [9] and in Monastir region in Tunisia (33 years) [10].

The frequency of fungal infections was dramatically reduced after 55 years of age and this corroborate the finding in one Egyptian study [11], and opposite the finding of study conducted in Malaysia, in which the most of patients were older than 50 years [12]. This variation may be related to variations in demography, geography and exposure to risk factors.

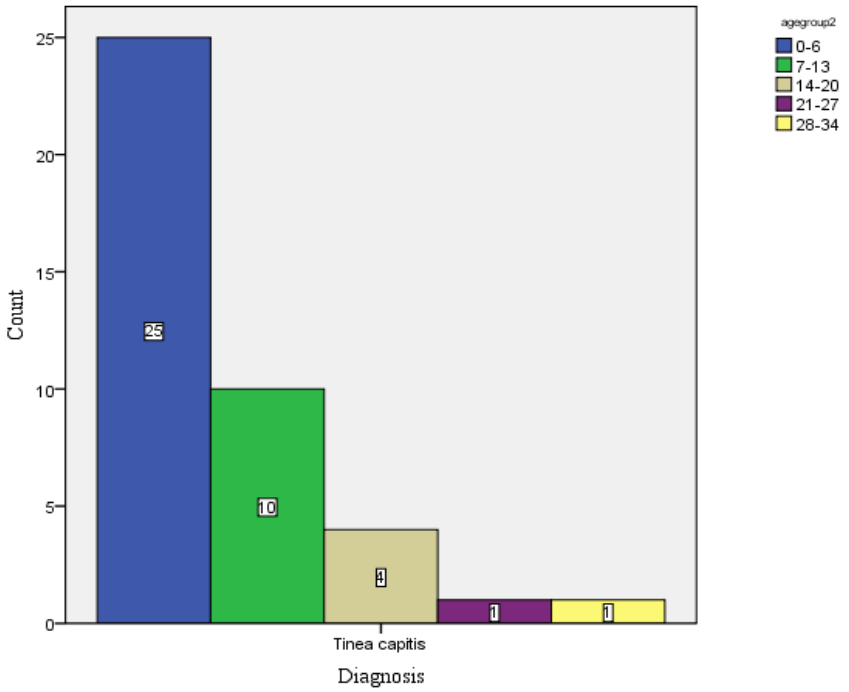

Fig. 3. Changing pattern of frequency and distribution of tinea capitis in relation to age groups

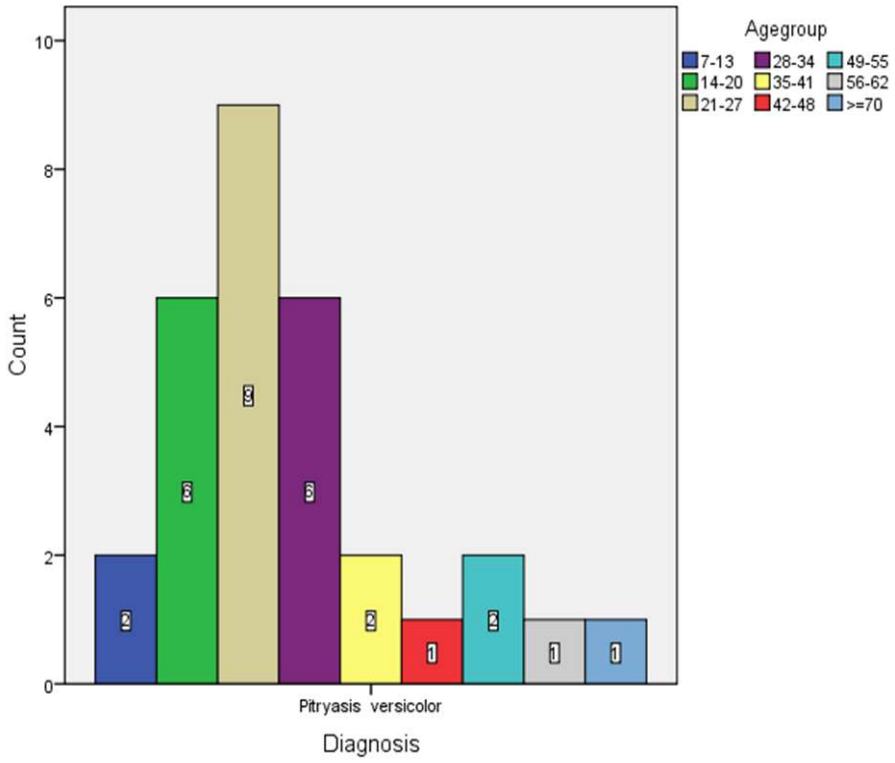

Fig. 4. Frequency and distribution of Pityriasis versicolor in different age groups

Male to female ratio in our study was 1.2, identical to result in study conducted in Malaysia, and opposite what was found in Tunisia with male to female sex-ratio (0.82) [10,12].

In this study, the most susceptible age group was children less than 7 years, similar to what was found in Tripoli (Libya) [8], in which the majority of patients (85%) were children less than 15 years old, and also similar distribution was found in patients attending to some hospitals in Egypt and the susceptibility was high to tinea capitis, same to our finding [11]. The second more affected age group in our study was from 21 years up to 27 years, showing more frequent Pityriasis versicolor. While in study conducted in India by (Kaur et al. [6]) the age group 21–30 years was the most affected followed by age group 31–40 years.

In study about childhood dermatomycoses in Sfax Hospital in Tunisia, it was found that, Tinea capitis was the most frequent before 13 years of age, and Pityriasis versicolor was the most frequent after 13 years of age. This finding corroborated with our results [13].

In our study tinea capitis represented 25.5% of all superficial mycosis, taking in consideration that candidiasis were not involved in our study, this distribution of Tinea capitis is similar to that found in patients attended to three hospitals in Egypt, and in Sfax (Tunisia), which found to be 69.4% in Tunisia and 28.6% in Egypt and followed with Tinea pedis in our study and in Egypt, but followed with Tinea corporis in Sfax (Tunisia). Tinea corporis in our study represented 21.7% of total, while it had only formed about 15% in some hospitals in Egypt [11,13].

5. CONCLUSION

Fungal infection is worldwide health problem and this study has improved our understanding of epidemiology of such common SFI in Zliten area. More than one fifth of total, 37 patients (22.9%) of infected patients were less than 7 years old, followed by age group from 21-27 years, which were 24 patients (14.9%). In contrast, Infection was less frequent after age of 55 years, in 9 patients, which represented (5.6%). The most frequent clinical type was Tinea capitis, in 41 patients(25.5%), followed by patients affected with, Tinea pedis, Tinea corporis and Pityriasis versicolor in descending order of 36, 35, 30 (22.4%, 21.7%, 18.6%).

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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