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Study of Dermatophytosis Prevalence in Patients Attending Dermatology Clinic at Tripoli Central Hospital

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Abstract

The current study was performed to determine the prevalence of superficial fungal infections among patients attending Dermatology Clinic at the Tripoli Central hospital. A total of 122 cases were selected with an age range 7-75 years. They were tested for fungal skin infections using microscopic and laboratory methods. The Results demonstrated that all patients had dermatophytes infections. Tinea ungium was the most common type of clinical infections (39.34%), followed by Tinea capitis (31.14%), Tinea pedis (22.13 %) and Tinea faciei (7.37 %). The results indicate that *Trichphyton violacenm* was the most common etiological agent of dermatophyte infection (59.01%) followed by *Microsprum canis* (20.49%) *Trichophyton rubrum* (12.29%), *Epidermophyton floccosum* (4.09%) and *Trichophyton menagrophtis* (3.27 %). The findings of the current study showed that higher prevalence of dermatophytes was higher in rural areas than urban areas.

Keywords: dermatophytes, Tinea infection; *Microsporum; Trichophyton; Epidermophyton;* Libya.

المستخلص

اجريت الدراسة الحالية لتحديد مدى انتشار الاصابات الفطرية السطحية بين المرضى الذين كانوا يترددون على عيادة الأمراض الجلدية بمستشفى طرابلس المركزي. تم اختيار 122 حالة تراوحت اعمارها بين (7-75 سنة) و اختبرت هذه الحالات المصابة باستخدام الفحص المجهري للعينات والطرق المعملية. أظهرت النتائج أن جميع الحالات تعاني من اصابات فطرية جلدية وكانت سعفة الاظافر أكثر أنواع الاصابات شيوعًا (39.34٪) ، تليها سعفة الرأس (31.14٪) , سعفة القدم (22.13 %) وسعفة الوجه (7.37%) .واظهرت نتائج هذه الدراسة اوضحت ان فطر *Trichophyton violacenm* كان من اكثر الفطريات المسببة للإصابات الجلدية بنسبة (59.01 %) يليه فطر *Microsporum canis* بنسبة (20.49 %) ثم فطر *Trichophyton rubrum* بنسبة (12.29 %) يليه فطر *Epidermophyton floccosum* بنسبة (4.09 %) وفطر *Trichophyton menagrophtis* بنسبة (3.27 %), كما بينت نتائج الدراسة ان نسبة الاصابة بالأمراض الجلدية كانت اعلي في المناطق الريفية مقارنة بالمناطق الحضرية.

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Introduction

Infections caused by many fungi can be divided into three groups: systemic mycosis, superficial mycosis and subcutaneous mycosis. Among superficial infection, dermatophtes is the common infection caused by fungi known as dermatophytosis .The dermatophytes are a group of fungi that are able to damage and utilize keratin found in the skin, hair, nails, horns and feathers (Grumbt et al., 2013). Evidences indicate that dermatophyte fungi are one of the most efficient human parasites, due to their efficiency in invading keratinous tissues (Zarrin et al., 2011). Dermatophytes are classified into three genera of pathogenic fungi; *Epidermophyton*, *Microsporum* and *Trichophyton*. The dermatophytosis transfers to humans from animals (zoophilic) and from soil (geophilic) or through direct infection by personal contact (Anthropophilic) (Aho, 1988). Dermatophytes have been recorded all over the world and become a public health problem in many parts of the world especially in developing countries (Nweze and Eke, 2016). Havlickova et al. (2008) and Blanka et al. (2008) have reported that 20–25% of the world's population has skin mycoses and appeared to be a frequent form of infection. Infection of nails, toes and skin by non-dermatophytes *Candida* and some molds have been increasing (Satpathi et al., 2013). The Aim of this study is to isolate and identify the fungal agents from clinical samples causing dermatophytosis in patients.

Materials and Methods

This study was conducted at the Department of Botany, Faculty of Science, University of Tripoli. The study involvedpatients that are clinically diagnosed for superficial mycosis. Patients data were recorded using standard format. A total of 122 samples were collected from patients attending the dermatology clinic in Tripoli Central Hospital from October 2018 to September 2019 with age range of 7-75 years. Samples were taken from skin, nails and hair by a sterile razor blade and sterile scissors. All samples were placed in labelled sterile vials and transported to the Mycologicy Lab. Specimens were examined and treated with 10% KOH. Specimens of nails were examined after mounting with 20% KOH for 24 hours and then examined. Each specimen was placed on a drop of KOH solution using sterile forceps and cover slip was placed on the slide.

Isolation and Culture Method

Each scraping was cultured using Sabrourad Dextrose Agar (SDA) containing 0.05 g/ml of cyclohexamide and Chloramphenicol. The plates were incubated at 25°C and were examined twice a week for perpetually up to 3 weeks. Fungal isolates were sub-cultured on the plates of SDA and were examined microscopically for morphological characteristics.

Results

In this study, the 122 scrapings collected from suspected cases of dermatophytosis, 56 cases (45.90 %) were female and 66 (54.09%) from male patients' skin infected patients.

The etiological agents of dermatophycoses recorded in this study are *Trichophyton violacenm* was the predominant fungal species (59.01 %) followed by *Microsprum canis* (20.49 %), *Trichophyton rubrum* (12.29 %), *Epidermophyton floccosum* (4.09 %) and *Trichophyton menagrophtis* (3.27 %) (Table 1and Fig. 1).

Table 1. Number and percentage of dermatophytes isolates

No.	**Isolated species**	**No of isolates**	**In percentage**
1	*Microsprum canis*	26	20.49 %
2	*Trichophyton menagrophtis*	4	3.27 %
3	*Trichophyton rubrum*	15	12.29%
4	*Trichophyton violacenm*	72	59.01%
5	*Epidermophyton floccosum*	5	4.09 %
	Total	122	100%

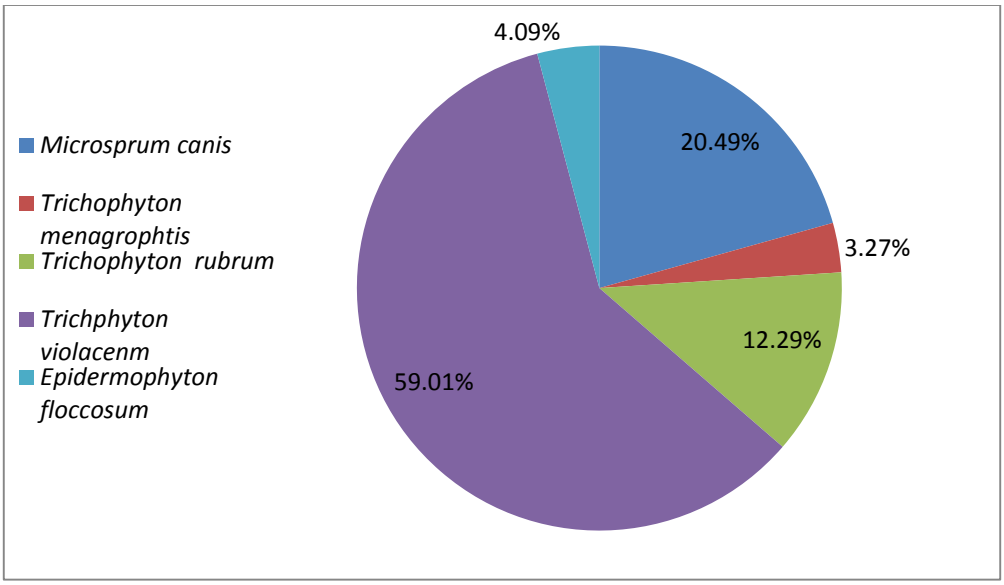

Fig. 1. Percentage of dermatophtes isolates

The prevalence rates of fungal infections with veneration to Tinea types Table 2 and Fig. 2) involved: Tinea capitis (31.14%), Tinea pedis (22.13 %), Tinea ungium (39.34%), and Tinea faciei (7.37%).

Table 2: Number and Percentage of Tinea types

Tinea types	**Number**	**Percentage(%)**
T. capitis	38	31.14%
T.pedis	27	22.13%
T. unguium	48	39.34%
Tinea faciei	9	7.37%

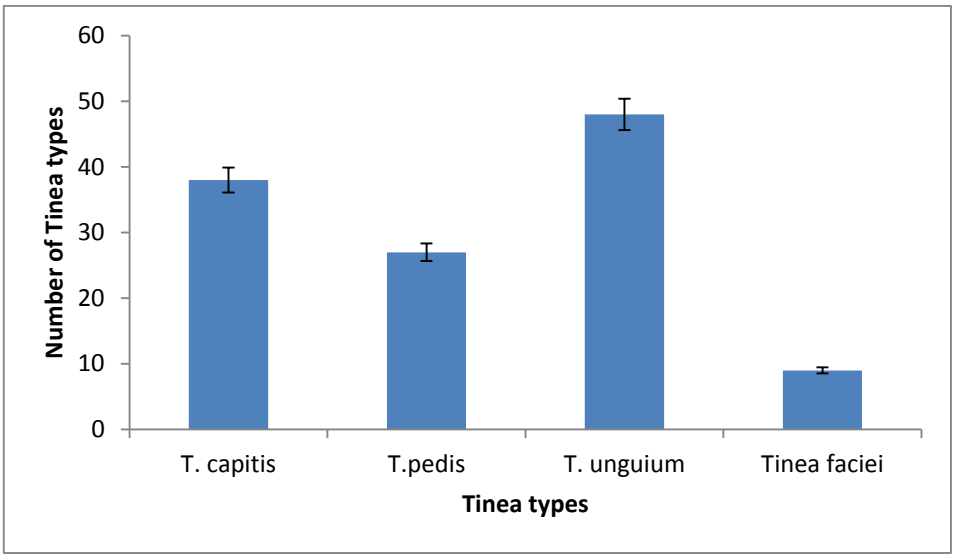

Fig. 2. Number of Tinea types

As shown in (Table 3 and Fig.3) the infection by dermatophytes was significantly higher with ages between 15- 30 years (43.4%). In contrast the percentage of infection was lower in other age groups as the following less than 15 years (12.2 %) 31-45 years(18.8 %), 46-61 years (13.9 %) and more than 61 years (11.4 %) .

Table 3. Distribution of dermatophytes fungal infections according to the age of patients.

Age groups	Frequency	Percentage
<15	15	12.2 %
15- 30	53	43.4%
31-45	23	18.8 %
46-61	17	13.9 %
>61	14	11.4 %

Results of this study have shown that the highest percentage of dermatophytes infection in the rural areas were Tinea ungium (55.73 %), Tinea capitis (27.94 %), Tinea pedis (22.05%) and Tinea faciei (8.82%) while in urban areas the fungal infections were found to be as the following Tinea ungium (37.03 %), Tinea capitis (35.18 %), Tinea pedis (22.22) and Tinea faciei (5.55 %).The number of infection was higher in rural areas compared to urban areas table 4 and 5) .

Table 4. Distribution of dermatophytes infections based on residence area (rural and urban areas)

Residence areas	Frequency	Percentage (%)
Rural areas	68	55.73 %
Urban areas	54	44.26 %
Total	122	100 %

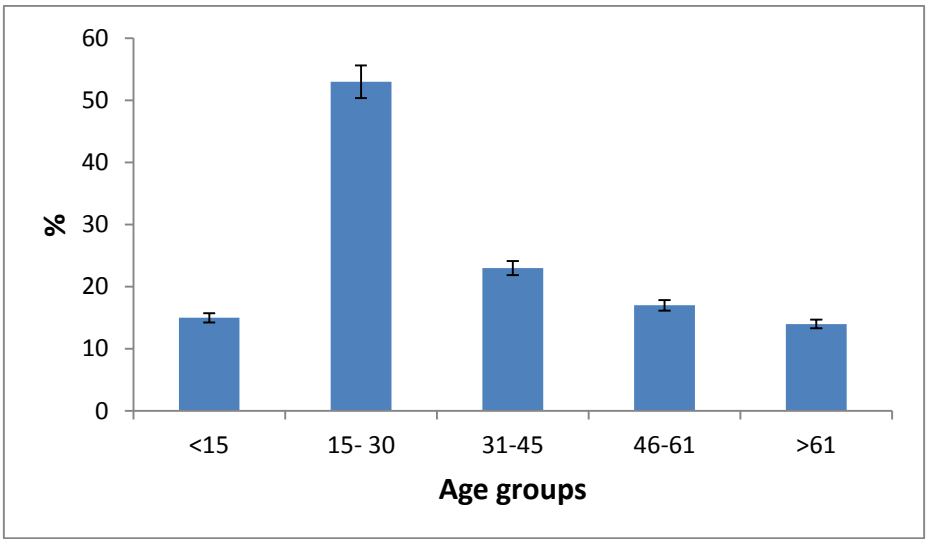

Fig.3. Distributions of dermatophytes fungal infections according to the ages of patients

Table 5. Distribution of the Tinea infection according patient's residence.

No	**Tinea types**	**Urban areas**		**Rural areas**	
		No. of patients	% of infection	No. of patients	% of infections
1	Tinea ungium	20	37.03	28	41.17
2	Tinea pedis	12	22.22	15	22.05
3	Tinea faciei	3	5.55	6	8.82
4	Tinea capitis	19	35.18	19	27.94
	Total	54	Total	68	

Discussion

In this study 122 patients suffering from dermatophytes infection were selected, in which Tinea ungium was the predominant type of infection (41.17%), Tinea capitis was the second common infection (27.94%), followed by Tinea pedis (22.05%) and Tinea faciei (8.82 %). The higher prevalence of infection between toes could be was attributed to the fact that they are exposed to sweating more than other parts of the body which helps the spread of the infection. The occurrence of Tinea infection was higher in 15 to 30 years (43.4%) age group followed by 31-45 years (18.8 %),46-61 years (13.9 %), less than 15 years (12.2 %) and >61 years (11.4 %). Similar observations were reported by Sarma and Borthakur (2007) and Kansra et al. (2016). In our study, four different types of Tinea were observed among which tinea ungium was the dominant infection accounting for 39.34% of the total infections. Results of this study revealed that dermatophytes affect all ages and sexes. Similar findings were observed in previous studies (Evans and Gentles ,1985; Adefemi et al., 2011). In the current study, *Trichophyton violacenm* represents a significant percentage of dermatophyte isolates. Our finding was similar to several studies

(e.g. Woldeamanuel et al.2005; Ali-Shtayeh et al., 2002; Ameen,2010). In this study the distribution of infection by residence was 55.73 % rural areas and 44.26 % inurban areas. Although there was no significant association between infection and residence, more people in rural areas seemed to be infected than those in urban areas which may be due to prolonged exposure to soil in rural areas and have frequent encounter with animals and less hygiene standard of living. Cohen and Powdery (2004) reported that fungal infections are often associated with animals. In the present study persons of all age groups were susceptible to dermatophytosis but it appeared to be less common in age group over 61 years (11.4 % of all cases).

Conclusion and Recommendation

The present study has indicated that Tinea unguium was the dominant clinical infection involving 39.34% of the total cases of dermatophytosis. of the total number of patients (122). Dermatophyte isolates *Trichphyton violacenm* was the predominant fungal species (59.01 %).

There is a need for further hospital survey involving large number of patients to ascertain any association between residence, age, gender and infection.

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