

## **Epidemiological Study Of Dermatophytosis In Okara, Pakistan**

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### **ABSTRACT**

**A clinical study was carried out among patients with tinea infections in Okara during the year 2013-2014 with respect to age, gender and clinical presentation of the infection. A total number of 150 samples were collected from tinea infected patients out of which only 120 were found positive for Trichophyton spp and Microsporum spp and no Epidermophyton was observed. Among positive cases Trichophyton spp was most dominant (68.3%) followed by Microsporum spp. (38%). The most effected age group was 0-10 years (40.8%). Male patients were infected more as compared to females and male to female ratio among positive cases was observed as 17:13. Rural community was observed to be most affected by the dermatophyte fungus. This study manifests the importance of correct mycological diagnosis for effective disease management.**

**Keywords:** *Tinea. Dermatophytosis. Epidemiology. Fungal infections. Pakistan*

### **INTRODUCTION**

Dermatophytes are keratinolytic fungi which are able to degrade the keratin in tissues like skin, hair, nails etc. Majorly these fungi are natural decomposers found in soil which may not infect the living host necessarily. Excessive use of medicines and immunosuppressive drugs caused this rate to experience a significant rise by the second half of 20th century [1]. Dermatophyte infections are termed as tinea infections which have been classified into three genera Microsporum, Trichophyton and Epidermophyton. Out of these three, Trichophyton and Microsporum species infect both humans and animals. Dermatological infections are a common problem especially in tropical and sub-tropical areas because humid and warm climate is perfect for fungal growth [2]. Among all the fungal infections up to 30% are dermatophytic infections [3]. In Pakistan most common specie is *T. violaceum* (41%), followed by *T. rubrum* (27%) [4]. Prevalence of *Tinea pedis* infections is 2.8% which is relatively

low [5]. In northern Pakistan incidence of nail infection is 78%, skin 18.3% and hair 30.3%. *Trichophyton interdigitale* is the most common specie isolated and identified from nail samples while *Trichophyton mentagrophytes* is the most commonly found specie in skin and nails [6]. Though much documented data is not available but dermatophyte infections are most common in patients suffering from type 2 diabetes mellitus [7]. Also *Trichophyton rubrum* cause dermatological infections in HIV positive patients. However, no detailed data is available on study of dermatophytes in Pakistan.

### **METHODS**

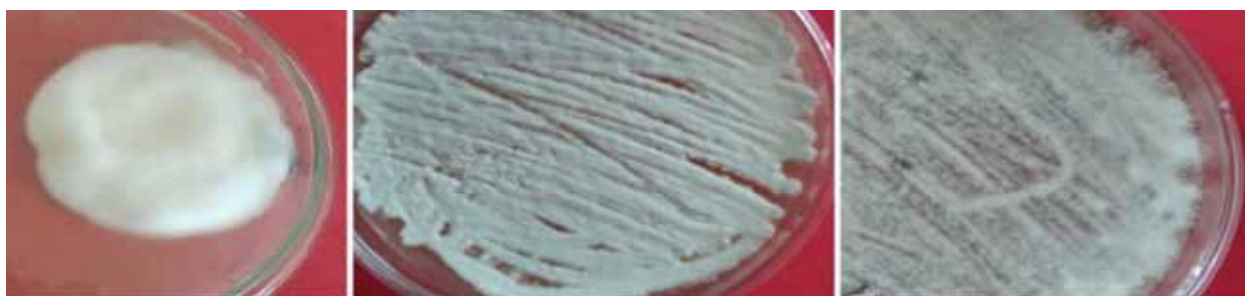
The study was undertaken from November 2013 to July 2014 on patients visiting District headquarter Hospital, Okara in the province of Punjab, Pakistan. Only those patients were selected as sample which had clear clinical symptoms judged by the clinician prior to antifungal therapy.

#### **Collection of samples**

150 samples of skin, hair and nails were collected from patients. Infected area was

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**Fig.1.** SDA culture plates of *T mentagrophytes* (L), *T erinacei* (M) and *T rubrum* (R)

wiped with 70% ethanol. Skin, nail scrapping and hair follicles were plucked from margins of lesions by sterile scalpel and tweezers and stored in sterile plastic containers (Sterile Uricol: Himedia) and immediately transported to Microbiology laboratory, The University of Lahore.

#### **Examination by microscopy**

Samples were treated with 20% KOH and examined under microscope. For skin scrapings, wet mount was undertaken while 40% KOH was used for hair and nail specimens [8]. Positive samples were cultured on Sabouraud Dextrose Agar (SDA, Himedia).

#### **Identification by culture**

All the KOH positive fungal samples were inoculated on SDA aided with chloramphenicol (50mg/L) and cycloheximide (500mg/L) and incubated at 30°C. After inoculating on SDA, regular weekly check was carried out for four weeks. The macroscopic exam included duration of maximum fungal growth, colony morphology, pigmentation (frontal and reverse). Colonies of identified dermatophytes were selected and stained with Lactophenol Cotton Blue (LCB) and observed directly under the microscope in both low and high power (100x) and (400x) of light microscope to study micro and macro conidia.

### **RESULTS**

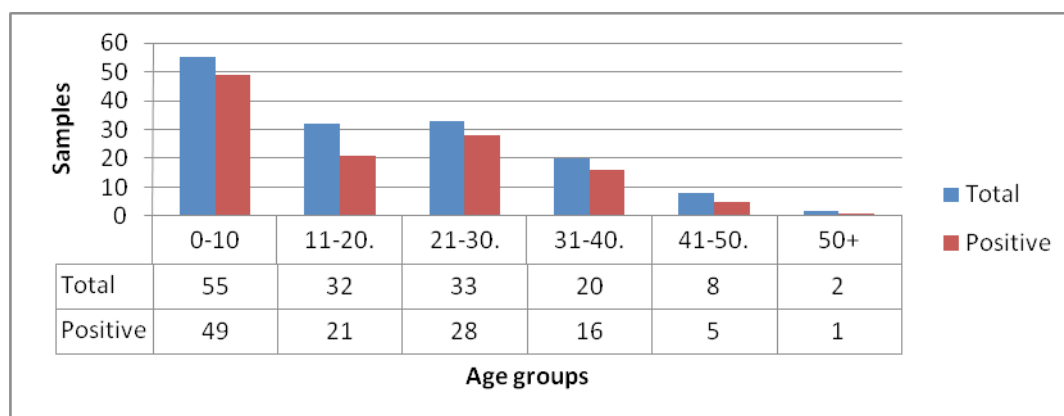
Of the 120 positive samples, 49 (40.8%) were below ten years age. Most prevalent species belonged to Trichophyton 82(68.3%),

followed by Microsporum spp 38(31.6%). No Epidermophyton was observed. Yeast infections were seen in 14(11.6%) cases. However some samples remained unidentified. 48 (40%) of the patients had lesions on scalp i.e. tinea capitis infections. 24(20%) had lesions on face, followed by 17(14.1%) on neck. 21(17.5%) trunk lesions, 6(5%) hands lesions and 4(3.3%) feet lesions were observed. Males were infected more 68(79.0%), Rural population was more infected 89 (95.6%) as compared to urban 31 (54.3%).

### **DISCUSSION**

The current study has focused on clinical pattern and prevalence of dermatophyte species in District Okara of Punjab, Pakistan. Its geographical location is 30° 48' 29" North, 73° 26' 45" East and it is approximately 570 feet (170 m) above sea level. Weather conditions are hot in summer and humid during rainy season.

All three Tehsils and more than 20 towns which comprise District Okara have relatively high population density which mainly consist of farmers, laborers, dairy and poultry workers. Census report of 1998 reported as 2,232,992 population of District Okara, of which only 12.84% were urban. Rapidly growing population, direct contact to soil and animals, unhygienic lifestyle of the local communities with relatively low socio-economic progress and hot and humid climate, all together might add to fungal infection development. Of the total 120 (80%) positive cases, 52 (43.3%) were females and 68 (56.5%) were males (Table-1).



**Fig. 2.** Demographic distribution of dermatophytosis patients

High prevalence of males as compared to females has been found by earlier studies worldwide [9,10]. One of the many reasons behind high occurrence rate of male patients may be attributed to professional orientation and more social activities. Highly infected age group was of children ranging in age from 0-10 years (40.8%) because of their frequent contact with soil, animals and with their fellows while playing (Fig 2). Mbatia and Nwajagu concluded same observations [11]. Current study showed most common reported site of infection to be scalp 48 (40%) While least common site was feet 4 (3.3%). Some other researchers have concluded similar results [12,13]. Out of 120 positive samples, 82 (68.3%) were identified as *Trichophyton spp.* followed by *Microsporum sp* 38 (36.1%), yeast 14(11.1%) and 21(17.5%)

for others that were unidentified. Current study showed *Trichophyton spp.* to be the leading causative agent of infection which is in accordance with results reported in India [14]. Contrary results have also been reported [15]. Although no *Epidermophyton spp.* was observed but opposite results have been reported as well [16] which shows that *Epidermophyton* is not native species in Okara, Pakistan. *Epidermophyton* cannot perforate the hair, for which reason they are found less commonly. Different species have been found prevailing in different geographical regions but *Trichophyton spp* is considered as most common specie worldwide for the reason that it has greater ability to invade keratinized tissues as they have proteinases, keratinases and other enzymes. Association of some dermatophyte

**Table1:** Prevalence of dermatophytic isolates according to gender

GENDER	Total	Positive	Trichophyton Spp	Microsporum sp	Epidermophyton spp	Yeast infections	Others (Un-identified)
Male	86	68	48	20	0	8	18
Female	64	52	34	18	0	7	5
	150	120 (80%)	82 (68.3%)	38 (31.6%)	0	14 (11.6%)	21 (17%)

species have also been found in dermatophytic infections which show that fungal spores are abundant in air and found frequently on human skin [17].

### CONCLUSION

The present study shows that climatic conditions of Punjab favor dermatophyte infections in local communities. Unhygienic circumstances conditions, contaminated tools; social communities may be some of the contributing factors. A more systemic study with larger communities involved would provide better approach to study epidemiology of dermatophyte infections nationwide.

### Consent

Written informed consent was obtained from all the patients for taking samples, images and publication.

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