

Original Research Article

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## Screening for Dermatophytosis and other Skin Infections in Orphanages in and around Kalaburgi, India

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### ABSTRACT

#### Keywords

Screening, dermatophytosis, orphanages, KOH mount and fungal culture.

#### Article Info

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Dermatophytosis is a common contagious skin disease caused by fungi known as Dermatophytes. Dermatophytosis is most common in tropical and subtropical countries. Kalaburgi is a district in Karnataka where the hot and humid climate favours the fungal infections. Dermatophytoses in orphans reflects the status of health hygiene and personal cleanliness of a community. The present study aimed at screening Dermatophytosis and evaluating the pattern of the same. 175 orphans were screened for dermatophytosis. Samples were collected with aseptic precautions and processed for KOH mount and fungal culture (Sabarauds dextrose agar and Dermatophyte test medium). The isolates were confirmed by performing LPCB mount. Among 175 orphans 6(3.42%) were positive by KOH mount and culture (Sabarauds dextrose agar & DTM) had 4(2.28%) positivity. The prevalence of other diseases such as Pityriasis alba, Tinea versicolor, Scabies and Pediculosis capitis were 6.8, 2.2, 12.5, 0.5% respectively. This study detects epidemiological pattern, predominant organism causing dermatophytosis and other skin infections in orphanages.

### Introduction

Superficial mycoses are infections of skin, hairs and nails caused by dermatophytes, yeasts and non-dermatophyte molds. Among these, dermatophytes are responsible for the largest number of cases. Dermatophytes are divided into three genera: *Trichophyton*, *Epidermophyton* and *Microsporum*. Distribution of the dermatophytes varies with the geographical area and course of time (Agarwal *et al.*, 2014).

The high humidity and temperature provides a fertile ground for their abundant growth (Sen *et al.*, 2006).

Dermatophytes can survive solely on outer cornified layers of the skin. The ability of certain fungi to adhere to particular host arises from numerous mechanisms and host factors, including the ability to adapt to the human body (Tainwala *et al.*, 2011).

India is a large subcontinent with remarkably varied topography, situated within the tropical and subtropical belts of the world. Its climate is conducive to the acquisition and maintenance of mycotic infections. Since dermatophytosis occurs most frequently during the monsoon, the present study was planned during this period (Singh Suman *et al.*, 2003).

According to World Health Organization (WHO), the prevalence rate of superficial mycotic infection worldwide has been found to be 20-25%, that of India is found to be 21-22% (Lakshmanan *et al.*, 2015; Suman Saurabh *et al.*, 2013).

Surveillance for fungal infections is important to define their burden and trends, to provide the infrastructure needed to perform various epidemiological and laboratory studies, and to evaluate interventions (Bassiri-Jahromi *et al.*, 2009).

The aim of the study was to know the prevalence of cutaneous fungal infection and other infections especially Dermatophytosis. By knowing the prevalence we can estimate the treatment problem and take measures to prevent the spread of infection.

## **Materials and Methods**

**Source of the study:** The study was conducted on students present in orphanages in and around Kalaburgi.

**Study period:** The study was conducted for a period of 2 months from June to July 2015.

**Inclusion criteria:** All the children present in the orphanages between the age group of 5 to 20 years were screened for Dermatophytosis.

**Exclusion criteria:** Students on antifungal treatment for dermatophytosis.  
Consent refusal

**Study design:** Prospective cross-sectional study

**Study site:** Orphanages in and around Kalaburgi

**Duration of study:** 2 months (June & July)

## **Methodology**

The present study was conducted in 5 orphanages in Kalaburgi. Ethical consideration was obtained from the institution. Sample size was 175. We had prepared a proforma which included the data regarding the socio-demographic information such as age, sex, Address, history of presenting illness, General physical examination and local examination which was filled by the investigator. Each child was examined in bright ambient light to search for disease of the skin and its appendages. The findings are recorded in the same form. If there are suspected dermatophytosis like scaly lesions on skin, alopecia, discolouration/pitting nails the specimen were collected under aseptic precautions with blunt end of sterile blade for skin lesions, hairs were plucked, nail clippings were collected and immediately sent to microbiology laboratory for further processing. In the laboratory if the specimen is skin scrapings/hair/nail clippings, KOH mount was performed and simultaneously inoculated on Sabouraud's dextrose agar and Dermatophyte test medium. The cultures were incubated at room temperature for 28 days. The tubes were observed for growth daily and if found, the day on which appearance of colony was noted and LPCB mount were done to identify the fungi. If there was no growth upto 28 days the specimen was considered to be negative. Finally the data was gathered using the proforma clinical examination, and culture details are compiled, coded and entered in excel spread sheet. And this data was tabulated and were analyzed using chi

square test to study the association between various factors. P value < 0.05 will be considered statistically significant. P value < 0.001 is highly significant. The data will be represented as number and percentage.

### Results and Discussion

Out of 175 screened orphan children Males were about 80 (45.71%) and females were 95 (54.28%). (Table 1)

Dermatophytes was highly significant with prevalence of 3.43%. Prevalence of other skin diseases like *Pyteriasis alba*, *T.versicolor* and scabies were 6.86%, 2.29%, 12.5% respectively. (Table 2 and Table 3)

Among 6 dermatophytes 6 were positive by KOH, 4 were positive by Sabaraud's dextrose agar and Dermatophyte test medium.(Table 4)

Among 4 grew on culture media 3 were *Trichophyton mentagrophytes* and 1 was *Trichophyton verrucosum*. (Table 5)

The present study covered the spectrum of dermatophytosis in a specialised population group of orphanages. The study included 175 children between age group 5-20 years among which Males were 80 and females were 95 in number.

The prevalence of dermatophytosis in our

study was 3.42%.The low prevalence might be due to the target population and age group we have selected. There are hardly any studies of dermatophytosis on orphanages.

The KOH mount had prevalence of 3.42% in comparison with Culture (Sabarauds dextrose agar& DTM) which had 2.28%.

The prevalence of other diseases such as *Pityriasis alba*, *Tinea versicolor*, *Scabies* and *Pediculosis capitis* were 6.8, 2.2, 12.5, 0.5% respectively.

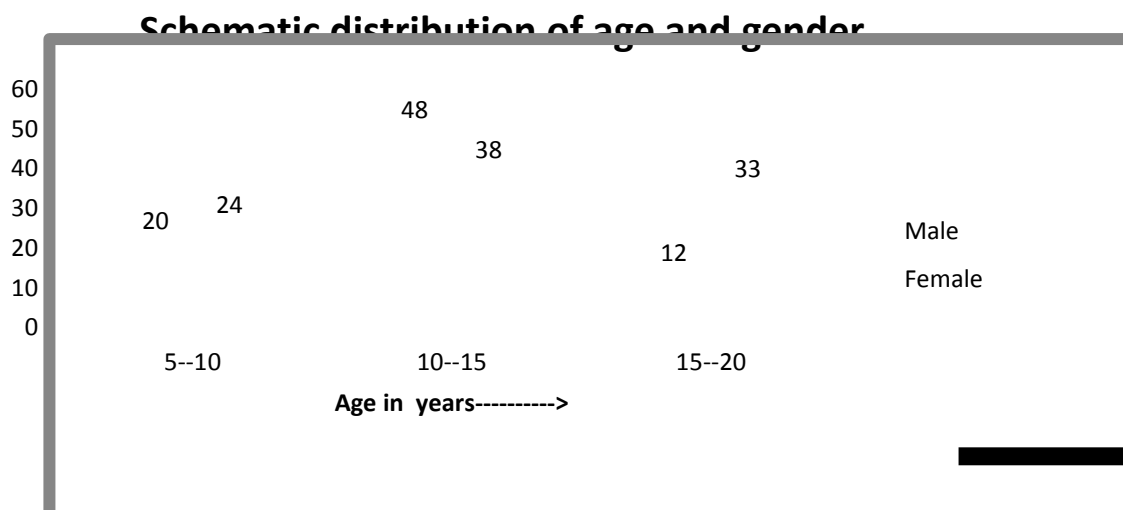
Among 6 dermatophytic infections 3 were *Tinea capitis*, 2 were *T.corporis* and 1 was *T.cruis*. This shows that prevalence of *Tinea capitis* was more due to overcrowding, poor hygiene and other factors.

The prevalence of overall fungal infections in our study was 12% which explains high prevalence due to environmental factors like semi-arid region, hot and moist climate.

Other disease apart from fungal infection was mainly comprised of Scabies and *Pediculosis capitis* which had 12.5 and 0.5% prevalence and the disease was observed in government orphanage. The incidence was increasing in that place due to inappropriate treatment and awareness about the disease.

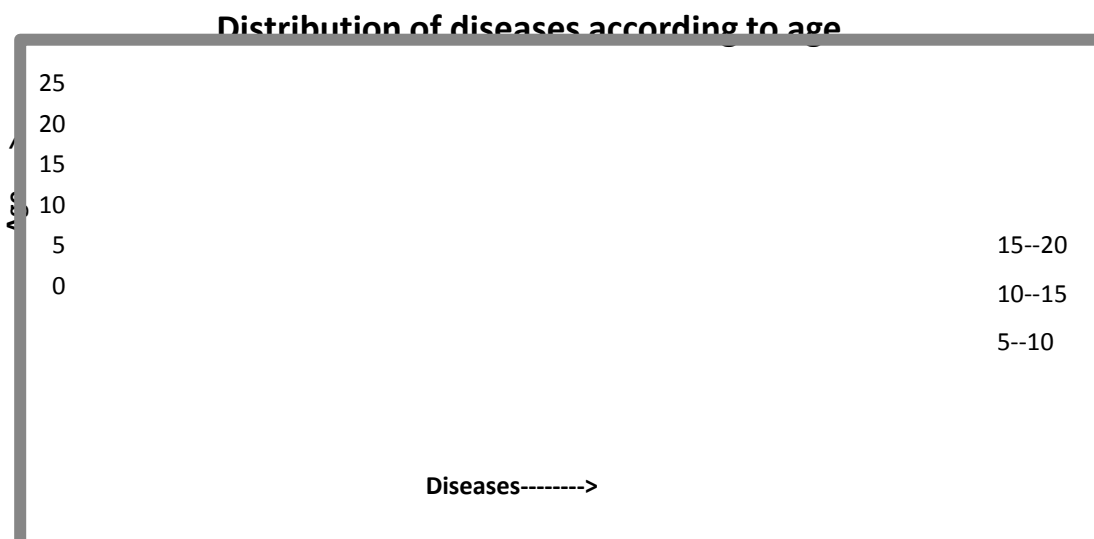
**Table.1** Age and gender distribution

Age (Yrs)	Male		Female		Total No.
	No.	%	No.	%	
5—10	20	45.45	24	54.55	44
10—15	48	55.81	38	44.19	86
15—20	12	26.67	33	73.33	45
<b>Total</b>	<b>80</b>	<b>45.71</b>	<b>95</b>	<b>54.29</b>	<b>175</b>



**Table.2** Distribution of diseases according to age

Age	Diseases					Total
	Dermatophytes	P.alba	T.versicolor	Scabies	Pediculosis capitis	
5-10	0	2	3	15	01	21
10-15	1	8	1	05	00	16
15-20	5	2	0	02	00	07
Total	6	12	4	22	01	44
Percentage	3.43	6.86	2.29	12.57	0.57	25.1
P-Value	0.004 Highly significant	0.45 Insignificant	0.06 Insignificant	0.0001 Highly Significant	0.22 Insignificant	



**Table.3** Prevalence of skin diseases.

Skin diseases	Prevalence %
Dermatophytosis	3.43
<i>Pyteriasis alba</i>	6.86
Tinea versicolor	2.29
Scabies	12.57

**Table.4** Comparison of KOH and culture on SDA and DTM

Chemical agent	KOH	SDA	DTM
No. of positive cases	6	4	4

**Table.5** Prevalence of dermatophytes

<i>Trichophyton mentagrophytes</i>	3
<i>Trichophyton verrucosum</i>	1
Total	4

**Table.6** Correlation between clinical and mycological findings

Clinical type	<i>T.mentagrophytes</i>	<i>T.verrucosum</i>
Tinea capitis	-	1
Tinea corporis	2	-
Tinea cruris	1	-
Total	3	1

**Table.7** Incidence of isolation of dermatophytes according to clinical condition.

Clinical type	Number of KOH positives	Number of culture positives
Tinea capitis	3	1
Tinea corporis	2	2
Tinea cruris	1	1

**Comparison of prevalence of dermatophyte infections with other studies**

Studies	Prevalence(%)
Study at Baroda <sup>4</sup>	44.62
Study at Tehran <sup>7</sup>	25.86
JC mohanthi <i>et al</i> <sup>8</sup>	36.19
A S chowdhari <i>et al</i> <sup>9</sup>	38.31
Present study	3.4

The prevalence of dermatophytosis in our study group was 3.4% which is lower than the studies mentioned in the above table.

The reason for low prevalence might be the target population we have selected and the age group.

**Comparison of prevalence of fungal infections with other studies**

<b>Study</b>	<b>Prevalence</b>
<b>Singh-beena<sup>4</sup></b>	60.83
<b>Shashindokth<sup>7</sup></b>	34.9
<b>Sharma <i>et al</i><sup>10</sup></b>	6.9
<b>Thakare <i>et al</i><sup>11</sup></b>	5.6
<b>Present study</b>	12.0

The prevalence of fungal infection in our study was 12% which was comparable and

higher than the studies conducted by Sharma *et al.*, and Thakare *et al.*

**Comparison of prevalence of other skin diseases with other studies**

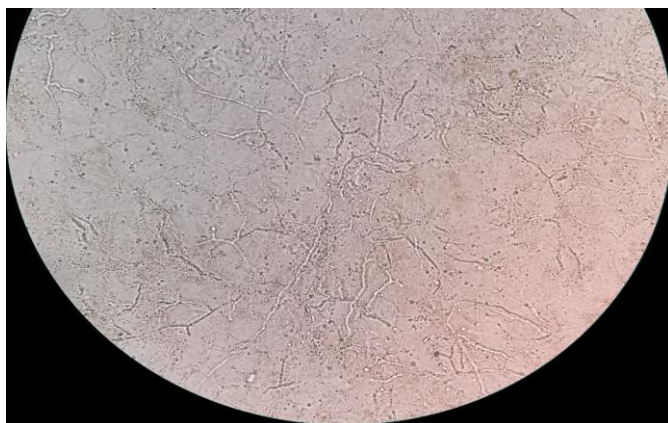
<b>STUDY</b>	<b>PREVALENCE (%)</b>
<b>Sharma <i>et al</i><sup>10</sup></b>	27.3
<b>Thakare <i>et al</i><sup>11</sup></b>	18.59
<b>Balai <i>et al</i><sup>13</sup></b>	34.8
<b>Present study</b>	13.1

Our study showed 13.1% prevalence in other skin diseases mainly composed of scabies and Pediculosis capitis cases.

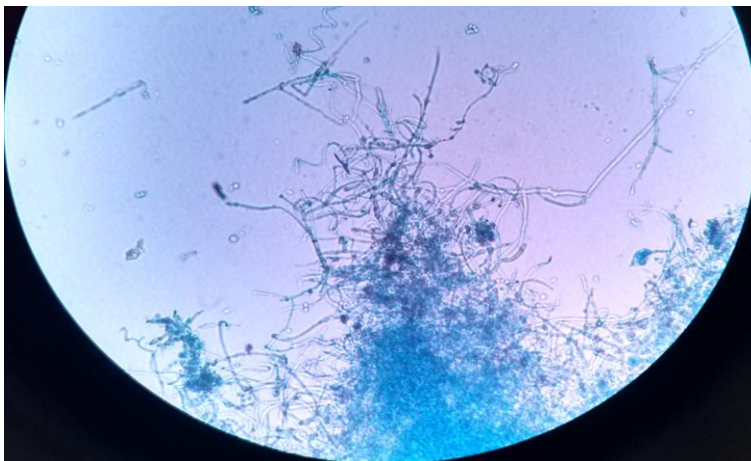
**Comparison of different species of Trichophyton with other studies**

The present study had less number of dermatophyte isolates. Among them 75 % (three isolates) were *Trichophyton mentagrophytes* and 25 % (one isolate) was *T.verrucosum*. Our study was comparable with study conducted by Sanjeev and at Tehran.

Study	T.mentagrophytes	T.verrucosum	T.rubrum
Lakshmanan <i>et al</i> <sup>5</sup>	14.5%	-	17%
Study at Baroda <sup>4</sup>	17.2%	-	73%
Study at Tehran <sup>7</sup>	19.9%	6.6%	-
Study by Sanjeev <sup>12</sup>	25%	10.5%	-
Present study	75%	25%	-







In conclusion, our study was conducted on orphanages which is a neglected group on which not much study has been done. Though the dermatophytes detected were less, commonest was *Tinea capitis* followed by *Tinea corporis* and *Tinea cruris*. The prevalence of fungal infections was comparatively high, scabies accounted more number of cases among overall skin infections in our study.

Apart from studying the prevalence of disease we have to look at factors responsible for the same and conduct educational programme creating awareness about the common contagious skin illnesses and how to prevent from getting infection. Regular checkup by the doctors on this under privileged population can be recommended to government authorities with follow up.

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