



International Journal of Dermatology, Venereology and Leprosy Sciences

E-ISSN: 2664-942X

P-ISSN: 2664-9411

www.dermatologypaper.com

Derma 2018; 1(1): 30-32

Received: 05-03-2018

Accepted: 22-03-2018

Dr. S Keerthi

Assistant Professor,
Department of Pediatrics, Sree
Lakshmi Narayana Institute
of Medical Sciences,
Puducherry, India

Dr. Likhita Punuru

Assistant Professor,
Department of Dermatology,
Sree Lakshmi Narayana
Institute of Medical Sciences,
Puducherry, India

Corresponding Author:

Dr. Likhita Punuru

Assistant Professor,
Department of Dermatology,
Sree Lakshmi Narayana
Institute of Medical Sciences,
Puducherry, India

A study on prevalence of superficial fungal infections in children in a tertiary care center

Dr. S Keerthi and Dr. Likhita Punuru

DOI: <https://doi.org/10.33545/26649411.2018.v1.i1a.199>

Abstract

Background: Superficial fungal infections are common in children and adolescents, particularly in areas with poor hygiene and close environmental exposure. These infections can range from mild conditions, such as tinea capitis and tinea corporis, to more serious forms like candidiasis. This study aimed to determine the prevalence of superficial fungal infections in children and adolescents and to explore the contributing demographic and environmental factors.

Materials and Methods: A cross-sectional descriptive study was conducted on 400 participants aged between 1 to 14 years attending the Pediatric and Dermatology outpatient departments of Sree Lakshmi Narayana Institute of Medical Sciences, Puducherry, over one year study period, i.e., from March 2017 to February 2018. Data was collected through clinical examinations, and samples were analyzed using potassium hydroxide (KOH) microscopy and fungal culture on Sabouraud dextrose agar.

Results: The overall prevalence of superficial fungal infections was found to be 31%. Tinea capitis was the most common infection, accounting for 43.5% of cases, followed by tinea corporis (29%). The prevalence was higher among children aged 6-12 years (39%) and in males (38%) compared to females (24%). Rural participants had a significantly higher prevalence of infections (36%) than urban participants (28%) ($p < 0.05$).

Conclusion: The study revealed a high prevalence of superficial fungal infections in children, particularly in rural areas and among males. Tinea capitis was the predominant infection, particularly in rural settings. These findings suggest the need for targeted public health interventions focusing on hygiene and early diagnosis, especially in high-risk populations.

Keywords: Superficial fungal infections, tinea capitis, children, adolescents, prevalence, rural population, dermatophytosis

Introduction

Fungal infections in children are common and can range from superficial skin infections to more serious systemic diseases. These infections are primarily caused by fungi that live in the environment, such as dermatophytes, yeasts, and molds. Superficial fungal infections, like tinea (ringworm), are among the most common, affecting the skin, hair, and nails, while more invasive fungal infections occur in immune compromised children, such as those undergoing chemotherapy or with chronic illnesses like HIV/AIDS^[1].

Fungal infections are prevalent worldwide but are more common in warm, humid climates, where fungi thrive. Superficial infections like tinea capitis (scalp ringworm) are most frequently observed in children, particularly those in close-contact environments such as schools and daycare centers. Candidiasis, caused by the *Candida* species, often affects infants, leading to conditions like diaper rash or oral thrush^[2-3].

Several factors contribute to fungal infections in children. Environmental exposure plays a significant role, as fungi are ubiquitous in nature. Poor hygiene practices, close physical contact, and sharing personal items can facilitate transmission. Invasive fungal infections are more likely to develop in children with weakened immune systems, prolonged antibiotic use, or underlying medical conditions that impair the body's natural defenses^[4].

The types of conditions that arise from fungal infections in children vary by the site of infection. Tinea corporis causes ring-shaped skin lesions, while onychomycosis leads to discolored, brittle nails. Oral thrush is common in infants and presents as white patches inside the mouth. Candidemia, a more serious infection, can occur in children with compromised immunity and may lead to fever, sepsis, or organ dysfunction.

Prompt diagnosis and appropriate antifungal treatment are essential to manage fungal infections in children and prevent complications [4,5].

Materials and Methods

This study was conducted to determine the prevalence of superficial fungal infections among children and adolescents. A cross-sectional descriptive study was conducted in the Pediatric and Dermatology outpatient departments, Sree Lakshmi Narayana Institute of Medical Sciences, Puducherry, over one year study period, i.e., from March 2017 to February 2018, focusing on individuals aged between 1 to 14 years, presenting to pediatric clinics and dermatology outpatient departments.

The study population consisted of children and adolescents who visited the participating healthcare centers during the study period. Participants were selected based on the presence of skin lesions or other clinical symptoms suggestive of fungal infections. A total of 400 participants were enrolled in the study after obtaining informed consent from their guardians.

Data were collected over a one year period. A standardized data collection form was used to gather information on demographic details, including age, sex, and residence, as well as clinical information such as symptoms, duration of infection, and history of similar infections. Trained healthcare professionals performed clinical examinations to identify suspected cases of superficial fungal infections, including tinea corporis, tinea capitis, tinea pedis and candidiasis.

For diagnostic confirmation, skin scrapings, hair samples, or nail clippings were collected from participants with suspected fungal infections. These samples were processed using potassium hydroxide (KOH) microscopy to identify fungal elements. Positive samples were then cultured on Sabouraud dextrose agar to isolate and identify the causative fungal species. Fungal growth was observed and classified based on morphological characteristics.

Data were entered into SPSS (version 25) for statistical analysis. Descriptive statistics, including frequencies and percentages, were used to summarize the demographic and clinical data. Prevalence rates of superficial fungal infections were calculated and stratified by age group, sex, and geographical location. Chi-square tests were applied to evaluate associations between demographic factors and the prevalence of infections, with a significance level set at $p < 0.05$.

The study was approved by the institutional ethics committee. Informed consent was obtained from all participants’ guardians, and patient confidentiality was strictly maintained throughout the study.

Results

Out of the 400 participants, 124 children were diagnosed with superficial fungal infections, resulting in a prevalence rate of 31%. Among the identified cases, the most common type of fungal infection was tinea capitis, which accounted for 43.5% (54 cases) of all infections. This was followed by tinea corporis at 29% (36 cases), tinea pedis at 16.9% (21 cases), and candidiasis at 10.5% (13 cases).

Age Distribution

The study population was divided into three age groups: 1-5 years, 5-10 years, and 10-14 years. The highest prevalence was found in children aged 6-10 years, with a rate of 39% (n=58). The 10-14 years age group showed a prevalence of 29% (n=36), while the 1-5 years group had a prevalence of 24% (n=30). The difference in prevalence among the age groups was statistically significant ($p < 0.05$).

Table 1: Prevalence of Superficial Fungal Infections by Age Group

Age Group	Total (n=400)	Infected (n=124)	Prevalence (%)
1-5 years	125	30	24%
6-12 years	150	58	39%
13-18 years	125	36	29%

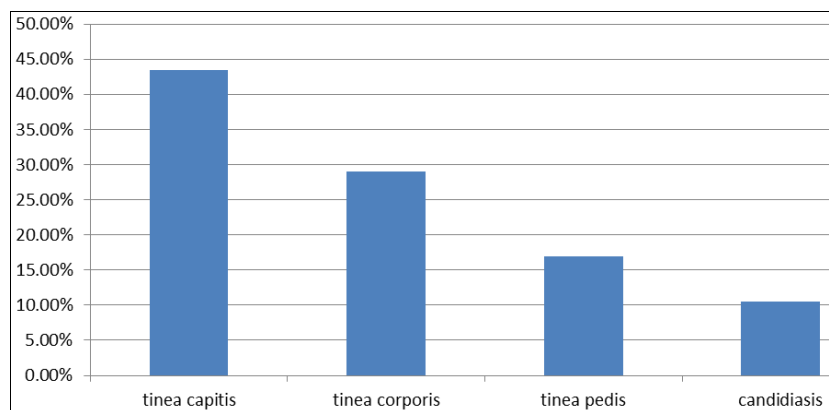


Fig 1: Distribution of superficial fungal infections

Gender Distribution

Regarding gender, males had a higher prevalence of superficial fungal infections compared to females. 76 males (38%) were affected, whereas 48 females (24%) were diagnosed with fungal infections. The gender difference in infection rates was statistically significant ($p < 0.05$), suggesting that boys are more prone to superficial fungal infections in this population.

Geographical Distribution

The study also analyzed the geographical distribution of the infections. Among the urban participants (n=250), the prevalence of fungal infections was 28% (70 cases). In contrast, rural participants (n=150) showed a higher prevalence of 36% (54 cases). The difference in prevalence between urban and rural areas was found to be statistically significant ($p < 0.05$), indicating that rural children are at a greater risk of developing superficial fungal infections.

Table 2: Prevalence of Superficial Fungal Infections by Gender

Gender	Total (n=400)	Infected (n=124)	Prevalence (%)
Male	200	76	38%
Female	200	48	24%

Table 3: Prevalence of Superficial Fungal Infections by Geographical Area

Area	Total (n=400)	Infected (n=124)	Prevalence (%)
Urban	250	70	28%
Rural	150	54	36%

Types of Fungal Infections by Geographical Area

The type of fungal infections also varied based on geographical location. In rural areas, tinea capitis was the most prevalent type, with 55.5% of cases (30 out of 54), while in urban areas, tinea corporis was the most common, accounting for 40% of cases (28 out of 70).

Table 4: Types of Fungal Infections by Geographical Area

Infection Type	Urban (n=70)	Rural (n=54)	Total (n=124)
Tinea capitis	20	30	54 (43.5%)
Tinea corporis	28	8	36 (29%)
Tinea pedis	12	9	21 (16.9%)
Candidiasis	10	3	13 (10.5%)

Discussion

The current study found that 31% of children and adolescents were affected by superficial fungal infections, with tinea capitis being the most prevalent infection type. This result aligns with several similar studies on pediatric populations. Kelly *et al.* [6] and Cvanova *et al.* [7] also reported high prevalence rates of tinea capitis in children, particularly in rural areas. In their studies, tinea capitis was associated with contact with animals and poor hygiene, which mirrors the findings of the present study where rural participants showed higher rates of infection.

Moreover, the finding that males had a higher prevalence of fungal infections than females (38% vs. 24%) is consistent with studies by Gulati and Nobile *et al.*, [8], who noted similar gender disparities in infection rates. The reasons for this gender difference may be linked to behavioral factors, as boys tend to have higher exposure to outdoor environments and animals, both known risk factors for dermatophyte infections

Another significant finding was the difference in prevalence between rural and urban populations, with rural areas having a higher infection rate (36% vs. 28%). This is supported by Fremerey and Nenoff *et al.* [9] who found that rural children were more susceptible to dermatophyte infections due to environmental exposure and closer contact with livestock

The current study’s urban-rural divide also parallels the observations of Medina Flores *et al.*, [10], who found higher rates of tinea capitis in rural settings, likely due to poorer access to healthcare and education on preventive measures.

Interestingly, while tinea corporis was the second most common infection in the current study, Medina Flores *et al.* [10] reported a higher prevalence of tinea pedis among urban adolescents. This difference could be explained by environmental and lifestyle factors, with urban adolescents potentially engaging more in sports or using shared facilities such as swimming pools, which are known risk factors for tinea pedis.

Conclusion

The study’s findings reinforce the role of environmental factors, hygiene, and access to healthcare in the prevalence of superficial fungal infections in children and adolescents. Addressing these factors through education and improved hygiene practices may reduce the incidence of such infections in vulnerable populations.

Acknowledgement

The authors would like to acknowledge the efforts made by the staff of department of dermatology and pediatrics while conducting this study.

Conflicts of Interest: Nil

References

- Havlickova B, Czaika VA, Friedrich M. Epidemiological trends in skin mycoses worldwide. *Mycoses*. 2008;51(Suppl 4):2-15. DOI:10.1111/j.1439-0507.2008.01606.x.
- Kliegman RM, St Geme JW, Blum NJ, Shah SS, Tasker RC, Wilson KM. Nelson textbook of pediatrics. 21st ed. Philadelphia, PA: Elsevier; c2020. Fungal infections in children.
- Patel PK, Erlandson KM, Wilke M. Fungal infections in children and neonates. *Infect Dis Clin North Am*. 2015;29(3):561-78. DOI:10.1016/j.idc.2015.05.008.
- Pappas PG, Kauffman CA, Andes DR, Clancy CJ, Marr KA, Ostrosky-Zeichner L, *et al.* Clinical practice guideline for the management of candidiasis: 2016 update by the Infectious Diseases Society of America. *Clin Infect Dis*. 2016, 62(4). DOI:10.1093/cid/civ933.
- Sahoo A, Mahajan R. Management of tinea corporis, tinea cruris, and tinea pedis: A comprehensive review. *Indian Dermatol Online J*. 2016;7(2):77-86. DOI:10.4103/2229-5178.178099.
- Kelly J, Gentry L, DiNubile MJ. Candidiasis and other fungal infections. *Pediatr Infect Dis J*. 2009;28(5):503-507. DOI:10.1097/INF.0b013e3181a66b14.
- Cvanova R, Novakova Z, Fagrelus A, *et al.* Prevalence of superficial fungal infections among school-aged children. *Pediatr Dermatol*. 2013, 30(4). DOI:10.1111/pde.12159.
- Gulati M, Nobile CJ. Candida biofilms: development, regulation, and molecular mechanisms. *Microbes Infect*. 2016;18(5):310-321. DOI:10.1016/j.micinf.2016.01.002.
- Fremerey A, Nenoff P. Dermatophytoses in childhood—an increasing problem. *Mycoses*. 2018;61(6):339-350. DOI:10.1111/myc.12888.
- Medina Flores D, Cota E, Vera LA, Alvarado LR, Osorio JA. Superficial fungal infections in adolescents: A study in marginal districts of Lima and Callao, Peru. *J Infect Dev Ctries*. 2009;3(4):313-317. DOI:10.3855/jidc.96.