

# Spectrum of infectious dermatoses in pediatric population attending tertiary care centers in Central India: an observational study

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## Abstract

**Background:** Pediatric infectious dermatoses are distinct group of disorders, comprising of skin problems encountered during childhood and adolescence. There is variation in the pattern and presentation of dermatoses in childhood compared to adults. **Aims & Objectives:** To determine the prevalence and clinical characteristics of different infectious pediatric dermatoses in rural tertiary care centers in central India. **Materials & Methods:** This is a cross-sectional study of infectious dermatoses in pediatric patients attending DVL OPD of tertiary care centers, Index Medical College Hospital & Research Center, Indore (M.P.) & Amaltas Institute of Medical Sciences, Dewas (M.P.) between JULY 2018 to NOV 2019. **Results:** There were 106 boys and 94 girls in total 200 study populations. Over all most common infections in the present study were Molluscum contagiosum (14.5%), Pityriasis versicolor (14%) and Tinea corporis (14%). Majority of the infectious skin conditions were Fungal infections (48%) among which most common was dermatophytosis (58.33% of fungal infections) followed by Pityriasis versicolor (29.16% of fungal infections). Viral infections comprised of 37% of all infections among which the most common is Molluscum contagiosum (39.1%) followed by Viral warts (21.6%) and Pityriasis rosea (14.86%). Bacterial infections were 15% of all the infections. Most common bacterial infection was Furunculosis (30%) followed by Impetigo (23.33%) and Secondary pyoderma (20%). **Conclusion:** The present study was aimed at studying the spectrum of infectious dermatoses in pediatric population in a rural health setup. The present study showed upward trend in fungal infections and downward trend in bacterial infections.

**Keywords:** Dermatoses, Pediatric, Infectious

## Introduction

Skin diseases are a major health problem in the pediatric age group and are associated with significant morbidity. Skin diseases constitute 30% of all outpatient visit to a pediatrician and 30% of all visits to a dermatologist involve children [1,2].

Due to anatomical differences, certain diseases occur in the childhood while many occur rarely at this time. Because of more delicate nature of the skin of infant and children as well as constant exposure to trauma, most skin diseases of childhood are attributable to physical causes, infections and allergy. The prevalence of skin diseases among children in various parts of India ranges from 8.7% to 35% [3]. Dermatologic conditions constitute at least 30% of all outpatient visits to pediatricians and 30% of all visits to dermatologists involve children [4,5].

The incidence of various dermatologic conditions varies according to age, race, geographic locations, climate, nutrition, hygiene, socio-economic conditions and heredity [6,7,8,9].

As the age advances, the skin matures, immune response of the body develops and a child receives vaccination for various infectious diseases. If there's a dysfunction at any of these, the child gets more prone to infections. Various epidemiological studies have been undertaken across the world including India to study the pattern of pediatric dermatoses.

The pattern of skin diseases in India is different across the states, rural and urban areas, and hilly areas. The present study was conducted to assess the pattern of various infectious dermatoses in pediatric patients along with prevalence, in rural tertiary health care centers.

Manuscript received: 30<sup>th</sup> October 2019

Reviewed: 10<sup>th</sup> November 2019

Author Corrected: 15<sup>th</sup> November 2019

Accepted for Publication: 19<sup>th</sup> November 2019

## Materials and Methods

Study was conducted on 200 children with infectious dermatoses aged below 14 years attending the Dept. Of D.V.L, Index Medical College Hospital and Research Center, Indore and Amaltas Institute of Medical Sciences, Dewas (M.P.).

**Inclusion criteria:** All clinically diagnosed cases of infectious dermatoses aged below 14 years of age attending outpatient department were included.

## Results

200 cases were studied which showed a male preponderance (53%) (Table 1). Overall most common infections in the present study were Molluscum contagiosum (14.5%), Pityriasis versicolor (14%) and Tinea corporis (14%). Majority of the infectious skin conditions were Fungal infections (48%) among which most common was dermatophytosis (58.33% of fungal infections) followed by Pityriasis versicolor (29.16% of fungal infections). Viral infections comprised of 37% of all infections among which the most common is Molluscum contagiosum (39.1%) followed by Viral warts (21.6%) and Pityriasis rosea (14.86%). Bacterial infections were 15% of all the infections. Most common bacterial infection was Furunculosis (30%) followed by Impetigo (23.33%) and Secondary pyoderma (20%). The number of cases divided through age distribution is represented through Table 2.

Most of the skin conditions in neonates were candidiasis (40.9%) and tinea capitis (9.09 %). In > 1 month to 14 years age group of children among infectious disorders, children were found to be affected most by Molluscum contagiosum (14.5 %), Tinea corporis (14 %), Pityriasis versicolor (14 %), Tinea cruris (8.5%), Viral warts (8%), Candidiasis (6%), Pityriasis rosea (5.5 %), and chicken pox (5%)

**Table No.-1: Sex distribution.**

| Patients     | Number     | Percentage (%) |
|--------------|------------|----------------|
| Male         | 106        | 53             |
| Female       | 94         | 47             |
| <b>Total</b> | <b>200</b> | <b>100</b>     |

**Table No.-2: Age distribution.**

| Age              | Number | Percentage (%) |
|------------------|--------|----------------|
| Neonate-1 month  | 22     | 11             |
| 1 month-5 years  | 70     | 35             |
| 5 years-14 years | 108    | 54             |

**Table-3: Spectrum of diseases.**

| Category             | Number | Percentage (%) |
|----------------------|--------|----------------|
| Fungal infections    | 96     | 48             |
| Viral infections     | 74     | 37             |
| Bacterial infections | 30     | 15             |

In the study, fungal infections were most common, comprising 48% of all the infectious dermatoses. Viral infections and bacterial infections comprised of 37 % and 15% respectively (Table 3).

Among the fungal infections, dermatophytic infections were the most common (57.5%) followed by Pityriasis versicolor (29.16%) and Candidiasis (12.5%) (Table 4).

**Table-4: Distribution of fungal infections.**

| Fungal infections     | Number    | Percentage (%) |
|-----------------------|-----------|----------------|
| Tinea corporis        | 28        | 29.16          |
| Tinea cruris          | 17        | 17.08          |
| Tinea capitis         | 7         | 7.2            |
| Tinea faciei          | 4         | 4.1            |
| Pityriasis versicolor | 28        | 29.16          |
| Candidiasis           | 12        | 12.5           |
| <b>Total</b>          | <b>96</b> | <b>100</b>     |

Among the viral infections, most common infections were Molluscum contagiosum (39.1%), viral warts (21.6%), Pityriasis rosea (14.86 %) and Chicken pox (13.5%) (Table 5).

**Table-5: Distribution of viral infections.**

| Viral infections          | Number    | Percentage (%) |
|---------------------------|-----------|----------------|
| Molluscum contagiosum     | 29        | 39.1           |
| Warts                     | 16        | 21.6           |
| Pityriasis rosea          | 11        | 14.86          |
| Chicken pox               | 10        | 13.5           |
| Viral Exanthem            | 5         | 6.66           |
| Herpes simplex and zoster | 3         | 4.05           |
| <b>Total</b>              | <b>74</b> | <b>100</b>     |

Furunculosis (30%) was the most common bacterial infection in the study followed by Impetigo (23.33%), secondary pyoderma (20%), SSSS (10%) and pitted keratolysis (6.6%) (Table 6).

**Table-6: Distribution of bacterial disease.**

| Bacterial infections | Number    | Percentage (%) |
|----------------------|-----------|----------------|
| Furunculosis         | 9         | 30             |
| Impetigo             | 7         | 23.33          |
| Secondary pyodermas  | 6         | 20             |
| SSSS                 | 3         | 10             |
| Pitted keratolysis   | 1         | 3.33           |
| Intertrigo           | 1         | 3.33           |
| Congenital syphilis  | 1         | 3.33           |
| Leprosy              | 1         | 3.33           |
| TBVC                 | 1         | 3.33           |
| <b>Total</b>         | <b>30</b> | <b>100</b>     |

## Discussion

Skin diseases are a major health problem in the pediatric age group and are associated with significant morbidity. Skin diseases in the pediatric age group can be transitory or chronic and recurrent. Cutaneous infections are common in children during school going years. Skin problem in children during the first few weeks of life can raise concern, even for experienced of neonatologists and pediatric dermatologists.

The skin of a newborn infant differs from adult skin in several ways that place the infants at increased risk for thermal instability, skin damage, percutaneous infection and toxicity from topically applied agents [10]. Hot and humid climate of a developing nation are more prone to infectious dermatoses. Poor sanitation and low socioeconomic status also may be an important factor for increased prevalence of pediatric infectious dermatoses.

Majority of the skin conditions in neonates were candidiasis (40.9%) and tinea capitis (9.09 %). In > 1 month to 14 years age group of children among infectious disorders, children were found to be affected most by *Molluscum contagiosum* (14.5 %), *Tinea corporis* (14 %), *Pityriasis versicolor* (14 %), *Tinea cruris* (8.5%), Viral warts (8%), *Candidiasis* (6%), *Pityriasis rosea* (5.5 %), and chicken pox (5%).

There was variation in prevalence of infectious dermatosis among the age groups in the present study. In the neonatal age and 5 years-14 years age group (school going children) fungal infections were predominantly seen while in the >1 month-5 years group (toddler) bacterial infections were the most common group of infections seen followed by fungal infections.

Overall in the study, bacterial infections constituted 15 % of the total infections compared to other study like Patel et al. (24.90%) [11] and Thappa (25.64%). [1]. *Furunculosis* was the most common bacterial infection with 30% of total bacterial infections, followed by *impetigo* with 23.33%, then secondary bacterial infections with 20% of bacterial infections. *Pyodermas* were the single most common dermatoses found out by Bhatia [12] and Ghosh et al. [13]

Fungal infections of the skin constituted 48% of the total infections. *Dermatophytic* infections were the most common among these infections making up to 58.33%. *Tinea corporis* was found in a significant number of children forming 50% of *dermatophytic* infections and 29.3% of all fungal infections followed by *Tinea cruris*. These findings supported by other studies like Patel et al. (7.81%) [11] Thappa (8.49%), [1] Sharma [14] and Ben Saif and Al Shehab [15].

*Pityriasis versicolor* was seen in 29.16% of total fungal infections. The incidence varied from 3.3 to 8.5 in various other studies. [16,17,18] Among candidal infections, which constituted 12.5% of the fungal infections. Karthikeyan et al.'s study was similar to us which showed *candida* infections constituted 2.1% of total dermatoses [17].

The viral infections constituted 37% of the total infections. *Molluscum contagiosum* was the most common viral disease constituting 39.1% of these infections. Karthikeyan et al. in their study observed that incidence of *molluscum contagiosum* was 2.5% in children aged 1 to 15 [17]. Second most common viral infection in the present study was Warts, which constituted 21.6% of viral infections. It was observed that viral warts were more common in the adolescent group, similar to observations in previous studies [11,19]. Similar to findings observed

by the study of Sharma and Mendiratta [14]. While studies of Patel (1.53%), [11] and in countries like Turkey, Switzerland, recently in Taiwan and Nigeria where the higher incidence of warts in children were found. [4,20,21,22]. *Pityriasis rosea* was the next common viral infection with 14.8% of viral infections. Hand foot mouth disease constituted 5.4% of viral infections.

The incidence of *Varicella* was 5% in the present study which was similar to that reported by Karthikeyan et al [17]. The incidence of *Herpes simplex* viral infection was 1.5% in the present study whereas in Karthikeyan et al. study, it was 0.37% [17]. *Scarlet fever* constituted 0.5% of all the infections.

## Conclusion

The present study was aimed at studying the spectrum of infectious dermatoses in pediatric population in a rural health setup. The present study showed upward trend in fungal infections due to host related factors which is transferred to children due to contact. The study also showed downward trend in bacterial infections which is corroborating with the society trend due to better availability of antibiotics and better reach of hospital setups in rural population. More number of large population-based studies are required for the accurate findings.

**Limitation of the study:** The study was conducted in Central India and was on small sample size and may not represent the entire country.

## What does this study add to existing knowledge?

This study adds to the trend of infectious skin diseases in Central India and highlights the rise of fungal infections in pediatric population.

## Author's contribution

- Dr. Akhil Shah: Main Author, Principal investigator, Data collection, Data analysis
- Dr. Parikshit Sharma: Co-author, Co-investigator, Data collection, Data analysis
- Dr. Surendra Singh Bhati: Corresponding author, Co-investigator, Data collection
- Dr. Anushtha Tomar: Data collection
- Dr. Shubhang Jain: Data collection

**Funding:** No funding sources

**Conflict of interest:** None declared

**Ethical Approval:** This study was approved by the Institutional Ethics Committee

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## How to cite this article?

Shah A., Sharma P., Bhati S.S., Tomar A., Jain S. Spectrum of infectious dermatoses in pediatric population attending tertiary care centers in Central India: an observational study. *Int J Pediatr Res.* 2019; 6(11): 567-571. doi:10.17511/ijpr.2019.i11.03