Original Article

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Paediatrics Section

# A Retrospective Cross-sectional Study of Paediatric Dermatoses during the COVID-19 Pandemic in a Tertiary Care Hospital in Bengaluru, Karnataka, India

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## ABSTRACT

**Introduction:** Dermatologic conditions constitute atleast 30% of all outpatient visits to paediatricians and 30% of all visits to dermatologists involve children. Skin conditions that manifest themselves during childhood and adolescence are referred as paediatric dermatoses and make up their own unique category of skin conditions.

**Aim:** To identify the dermatological conditions which were prevalent during the Coronavirus Disease 2019 (COVID-19) pandemic in a tertiary care hospital in Bangalore.

**Materials and Methods:** This retrospective cross-sectional study was conducted by reviewing records of Outpatient Department (OPD) of Dermatology and Paediatrics in the tertiary care centre, Bengaluru from February 2020 to February 2022. The demographic details and diagnosis were recorded. The diagnosis was made according to ICD-10 (International Classification of Diseases 10th Revision) and the prevalence of different dermatoses was calculated. Mean and standard deviation was calculated for descriptive statistics. Data were statistically evaluated with IBM Social Package for Statistical Analysis (SPSS) Statistics for Windows version 26.0., IBM Corp., Chicago, IL.

**Results:** The total number of paediatric cases attended dermatology OPD during the two year pandemic was 558. The prevalence of paediatric dermatoses in the present study was 193 (34.58%). There were 283 girls and 275 boys with Male:Female was 1:1.02. There was a female preponderance of 50.7% against 49.28%. The majority was infectious lesions 153 (27.41%), congenital dermatoses 9 (1.61%), Papulosquamous disorders 23 (4.12%), Pilosebaceous disorders 111 (19.89%), dermatitis 193 (34.58%) followed by Miscellaneous 69 (12.36%).

**Conclusion:** This study was conducted during COVID-19 pandemic which in comparison to the other studies shows a similar distribution of dermatoses. But there was a significant shift of age group affected which can be well explained by the lockdown and social isolation.

**Keywords:** Children, Coronavirus disease-2019, Infections, Skin diseases

## INTRODUCTION

Skin conditions that manifest themselves during childhood and adolescence are as paediatric dermatoses and make up their own unique category of skin conditions [1]. Children are not simply "little adults," and there are significant changes in the clinical appearance, management, and prognosis of many dermatoses; as a result, paediatric dermatoses need to be viewed from a different perspective than adult dermatoses [2]. Atleast 30% of all outpatient visits to a paediatrician are due to dermatological issues, and a comparable amount of visits to a dermatologist are made by children [3]. Children in different regions of India have a prevalence of skin illnesses that ranges from 8.7-35% [4]. Children who attend school have a higher risk of contracting skin diseases than children who do not attend school [5]. These diseases are contagious and easily spread due to the children's frequent close contact with one another [6]. These diseases can be avoided by providing effective health education to children, parents, and teachers.

Studies from various parts of the world show different patterns of skin diseases in children [4-7]. Several studies made an attempt to study the distribution of dermatoses during the COVID-19 pandemic [3,8].

The present study aimed at overview of different dermatologic diseases in infants and children during COVID-19 pandemic in a tertiary care hospital in Bengaluru.

## MATERIALS AND METHODS

This is a retrospective cross-sectional study conducted for two years from March 2022 to June 2022. The study was conducted by reviewing Outpatient Department (OPD) records of Dermatology and Paediatrics East point College of Medical Sciences and Research Centre, Bengaluru, Karnataka, India, from February 2020 to February 2022. The demographic details and diagnosis were recorded. Ethical clearance was obtained (EPCMSRC/ADM/IEC/2021-22/10). All consecutive children aged 0-18 years attending Paediatric and Dermatology OPD were included in the study.

The OPD records of Dermatology were reviewed and details of the children aged 0-18 years with diagnosis were noted. The OPD register of paediatrics was reviewed and details of children who came for skin lesion or were diagnosed with some skin lesion were noted. The master chart was prepared. Classification of skin lesions was done and prevalence of each was noted.

All patients were divided into six different groups: <1 month (neonates), 1 month to 1 year, >1 to 5 years and 6 to 10 years, 11 to 15 years, 16 to 18 years. The diagnosis of dermatological condition was established on the basis of detailed review of history, clinical features, physical examination including skin. Whenever necessary, diagnosis was confirmed by laboratory investigations such as KOH mount, gram's strain, Wood's lamp examination, diascopy, Tzanck

test, haematological and biochemistry analysis, purified protein derivative and skin biopsy as required. Dermatoses were classified according to the ICD-10 [8]. The Dermatoses were classified as Infectious, Congenital, Papulosquamous, Pilosebaceous, dermatitis disorders and miscellaneous. The following factors were investigated- the gender and age distribution of dermatoses, as well as the percentage frequency distribution of dermatoses.

During COVID-19 pandemic, hospital patients were serviced in two separate buildings for COVID-19 positive and non COVID-19 individuals. The present study was restricted only to non COVID-19 paediatric dermatoses during pandemic. If more than one diagnosis was made, the acute condition for which the child sought medical advice was considered.

## STATISTICAL ANALYSIS

Descriptive statistics were reported as mean (SD) for continuous variables, frequencies (percentage) for categorical variables. Data were statistically evaluated with IBM SPSS Statistics for Windows, Version 26.0., IBM Corp., Chicago, IL.

## RESULTS

The total number of paediatric cases attending both Dermatology OPD and Paediatric OPD during the two year pandemic was 558. The prevalence of paediatric dermatoses in the present study was 193 (34.58%). There were 283 girls and 275 boys. There was a female preponderance of 50.7% against 49.28%. Male:Female was 1:1.02. The age group in the present study was one month till 18 years. The age group mostly affected were adolescents 11-15 years (57.95%) followed by primary school age group of 6-10 years (23.5%). In <1 year, 2 were boys and 5 were girls. In 1-5 years, 46 were boys and 49 were girls. In 6-10 years, 57 were boys and 71 were girls. Among 221 in 11-15 years, 125 were boys and 96 were girls. In 107 children among 16-18 years, 45 were boys and 62 were girls [Table/Fig-1].

| Age (in years) | Boys (n=275) | Girls (n=283) | Total |
|---|---|---|---|
| <1 year | 2 | 5 | 7 |
| 1-5 years | 46 | 49 | 95 |
| 6-10 years | 57 | 71 | 128 |
| 11-15 years | 125 | 96 | 221 |
| 16-18 years | 45 | 62 | 107 |

**[Table/Fig-1]:** Distribution of age among the study participants (N=558).

The majority was infectious lesions 153 (27.41%), congenital dermatoses 9 (1.61%), papulosquamous disorders 23 (4.12%), pilosebaceous disorders 111 (19.89%), dermatitis 193 (34.58%) followed by miscellaneous 69 (12.36%).

There were 153 (27.4%) children with infectious dermatoses constituting 69 (62.1%) boys and 84 (54.9%) girls. The fungal infections are the most common seen in 40.5%, followed by viral (30.7%), parasitic (24.18%) and bacterial (4.5%). The fungal and viral infections were more common in girls than boys [Table/Fig-2].

About nine children came with congenital lesions which includes hypertrichosis, aplasia cutis, nevus anaemicus, blaschitis, ILVEN, etc., [Table/Fig-3].

There were 23 papulosquamous disorders of which 8 were boys and 15 girls. Palmo plantar keratoderma constitutes 39.14% of papulosquamous disorders. The second most common is psoriasis which constitutes 30.4% [Table/Fig-4].

| Infectious dermatitis | Boys (n=69) | Girls (n=84) | Total |
|---|---|---|---|
| Bacterial | 3 (4.34) | 4 (4.76) | 7 |
| Viral | 20 (28.98) | 27 (32.14) | 47 |
| Parasitic | 19 (27.53) | 18 (21.42) | 37 |
| Fungal | 27 (39.13) | 35 (41.67) | 62 |

**[Table/Fig-2]:** Distribution of infectious dermatoses among the study participants.

| Congenital disorders | Frequency (n=9) | Percentage (%) |
|---|---|---|
| Aplasia cutis | 1 | 11.11 |
| Nevus anaemicus | 1 | 11.11 |
| Blaschitis | 1 | 11.11 |
| Ilven | 1 | 11.11 |
| Hypertrichosis | 2 | 22.22 |
| Nevus depigmentosus | 1 | 11.11 |
| Neurofibromatosis | 1 | 11.11 |
| Lentigenosis | 1 | 11.11 |

**[Table/Fig-3]:** Distribution of congenital dermatoses among the study participants.

| Papulosquamous disorders | Boys (n=8) | Girls (n=15) | Total |
|---|---|---|---|
| Acanthosis nigricans | 1 | 2 | 3 (13.04) |
| Psoriasis | 2 | 5 | 7 (30.43) |
| Palmo plantar keratoderma | 4 | 5 | 9 (39.14) |
| Callosity | 0 | 1 | 1 (4.35) |
| Lichen planus | 1 | 2 | 3 (13.04) |

**[Table/Fig-4]:** Distribution of papulosquamous disorders among the study participants (N=23).

The pilosebaceous disorders were seen in 111 children. Of which, 56 (50.4%) were boys and 54 (48.64%) were girls. Boys were more affected than girls. Acne is the most common pilosebaceous disorder and is reported more commonly in boys than girls. The second common is keratosis pilaris which is more common in girls [Table/Fig-5].

| Pilosebaceous disorders | Frequency (n) | Percentage (%) |
|---|---|---|
| Acne | 80 | 72.10 |
| Keratosis pilaris | 17 | 15.30 |
| Comedones | 1 | 0.90 |
| Milia | 13 | 11.70 |

**[Table/Fig-5]:** Distribution of Pilosebaceous disorders among the study participants (n=111).

Among 193 cases in dermatitis group, 102 were boys constituting 52.8% and 91 were girls (47.1%). The majority of them were atopic dermatitis (36.2%). Allergic contact dermatitis, eczema, insect bite reaction, seborrheic dermatitis, urticaria, pityriasis alba, pityriasis rosea are the other dermatitis [Table/Fig-6].

There were 69 (12.36%) in miscellaneous group. Xerosis and telogen effluvium is the most common in the group [Table/Fig-7].

| Dermatitis | Frequency (n) | Percentage (%) |
|---|---|---|
| Allergic contact dermatitis | 18 | 9.33 |
| Atopic dermatitis | 70 | 36.27 |
| Diaper dermatitis | 1 | 0.52 |
| Eczema | 6 | 3.11 |
| Icthyosis | 2 | 1.04 |
| Insect bite reaction | 9 | 4.66 |

| | | |
|---|---|---|
| Perioral dermatitis | 7 | 3.63 |
| Pityriasis alba | 14 | 7.25 |
| Pityriasis rosea | 6 | 3.11 |
| Polymorphic light eruption | 3 | 1.55 |
| Pompholyx | 1 | 0.52 |
| Prurigo simplex | 1 | 0.52 |
| Seborrheic dermatitis | 28 | 14.50 |
| Urticaria | 25 | 12.95 |
| Xerosis | 2 | 1.04 |

**[Table/Fig-6]:** Distribution of dermatitis among the study participants.

| Miscellaneous | Frequency (n) | Percentage (%) |
|---|---|---|
| Alopecia areata | 4 | 5.8% |
| Burns | 4 | 5.8% |
| Canitis | 4 | 5.8% |
| Hair loss | 4 | 5.8% |
| Hyperhidrosis | 6 | 8.7% |
| Keloid | 7 | 10.1% |
| Lichen striatus | 4 | 5.8% |
| Onycholysis | 3 | 4.3% |
| PIH | 5 | 7.2% |
| Telogen effluvium | 14 | 20.2% |
| Xerosis | 14 | 20.2% |

**[Table/Fig-7]:** Distribution of miscellaneous dermatoses among the study participants (N=69).
PIH: Pregnancy induced hypertension

## DISCUSSION

The COVID-19 pandemic during the two years of 2020 till 2022 was a challenge to the whole world. Social lockdown was announced in India from March 25, 2020 for a period of 68 days [9]. In the present study, the hospital had arranged two separate buildings for managing COVID-19 and non COVID-19 patients. Our study focuses on analysing the dermatological conditions in children during the COVID-19 pandemic. In the present study, there were 558 cases. The prevalence of paediatric dermatoses in our study was 193 (34.58%) which was around 30% in the non COVID-19 times. The prevalence of dermatoses in most of the studies ranged from 14.3-76.5% [2-5].

The age group most affected during or study was adolescence 11-15 years comprising 57.95% which is similar to studies by Reddy VS et al., Sharma S et al., Medasani V et al., but in contrast, Rajeshwari KA et al., Sacchidanand S et al., showed primary school children of 5-10 years (48.6%) to be more affected [4,5,6,10,11].

There was a female preponderance with 55.83% females which is similar to non COVID-19 times from a study by Rajeshwari KA et al., during the year 2019 with 54.1% females [4]. Similar findings were reported by Karthikeyan K et al. Another study showed almost equal gender distribution or slight male preponderance Vellaisamy S et al., [12,13].

Dermatitis was the most common group of dermatoses seen in 34.8% of children attended OPD. Previous studies by Rajeshwari KA et al., (46%), Medasani V et al., (58.98%), Sacchidanand S et al., (32.47%), Bisht JS et al., (36.6%), Negi KS et al., (35.6%) showed infections and infestations as the most common group of dermatoses [4,10,11,14,15]. This may be explained by the fact that there was a lockdown and the schools were shut for more than 18 months in various parts of India. Hence, the chance of spread of infections was less.

Fungal infections of the skin constituted 40.5% of the total infections and 11.11% of the total dermatoses. This is similar to other studies like Medasani V et al., Karthikeyan K et al., [10,12]. The second most common in infection group was parasitic infestations which constitutes 24.1% similar to Sharma S et al., Negi KS et al., Bhatia V et al., which showed 5.1-22.4% parasitic infestations [6,15,16]. Scabies and Pediculosis capitis were the most common infestations seen in OPD.

Atopic dermatitis (36.3%) is the most common form of dermatitis seen. The other dermatitis was seborrhoeic dermatitis (12.4%), eczema (12%), pityriasis alba (6.7%), acute urticaria (6.2%), allergic contact dermatitis (5.6%) and others. Sacchidanand S et al., showed a frequency of 6.12% of atopic dermatitis [11]. In Medasani V et al., eczema was 33.33% and atopic dermatitis were 22.91% whereas in Sacchidanand S et al., eczema (20.6%) was frequently found [10,11].

The most common dermatoses seen in our study is acne (68.4%) which is classified under Pilosebaceous disorders. Other dermatoses were keratosis pilaris (15.3%), Milia (11.7%) and comedones (3.6%). This is in contrast to other studies where it showed only 5.6% in Reddy VS et al., and 8.06% in Medasani V et al., [4,10].

The fourth frequently found is Papulosquamous disorders which are seen in 4.1% in the present study whereas a study Medasani V et al., showed a prevalence of 0.92% and another study by Sacchidanand S et al., showed a prevalence of 6.08% [10,11]. Palmo plantar keratoderma and Psoriasis were the commonest in Papulosquamous disorders. Psoriasis was seen in 1.4% in a study conducted by Karthikeyan K et al., whereas in the present study it was 1.07% [12]. Other lesions seen were congenital dermatoses (1.6%) like hypertrichiosis, aplasia cutis, nevus anaemicus, nevus depigmentation and lentigenosis.

The hair and scalp disorders, keratinisation disorders were grouped into miscellaneous group which constituted 12.3% whereas in other studies 1-2% was the prevalence shown by Medasani V et al., and Dogra S and Kumar B [10,17].

This study was conducted during the COVID-19 pandemic. Poudyal Y et al., studied different patterns of skin diseases in paediatric population along with the seasonal variation in western part of Nepal [7]. Wadhwa D et al., conducted a retrospective study on children ≤18 years who presented to the dermatology OPD in a tertiary care hospital during the lockdown period. Out of 36 children, 50% were found to have pruritic skin diseases, 5.5% had true dermatological emergencies and 44.4% had non pruritic, non emergency conditions [3].

### Limitation(s)

Limitation was that, it was a single centre study. It would have been better if it was conducted in multiple centres. A comparative study of non COVID-19 period versus COVID-19 period could have yielded more useful data.

## CONCLUSION(S)

This study was conducted during COVID-19 pandemic which in comparison to the other studies shows a similar distribution of dermatoses. In our study, majority was infectious lesions, congenital dermatoses, papulosquamous disorders, Pilosebaceous disorders, dermatitis followed by miscellaneous. But there is a significant shift of age group affected which can well be explained by the lockdown and social isolation.

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