

Original Research Article

Prevalence and spectrum of pediatric dermatoses in school children: comparing hospital and school in rural Bangalore

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ABSTRACT

Background: Pediatric dermatoses are emerging distinct entities. The exact prevalence and pattern of dermatoses is not well known in India. This novel study attempts to simultaneously assess the prevalence and distribution of skin dermatoses in hospital and community among children of age 5-16 years in rural Bangalore, India.

Methods: A cross sectional prospective descriptive study of one week duration in July 2019 was conducted in east point hospital and Government school in rural Bangalore in the vicinity.

Results: The study had a total of 119 children, 72 from the hospital and 47 from the school with prevalence of dermatoses being 33.8% and 70% respectively ($p < 0.00001$). Primary school children were most commonly affected. Non-infectious dermatoses were most common, more so in school with eczematous lesions predominating. Bacterial infectious dermatoses were found more frequently in hospital children, while parasitic infestations were encountered commonly in school.

Conclusions: Pediatric dermatosis seems to be widely prevalent in India. Children visiting hospitals constitute only the tip of the iceberg present in the community.

Keywords: Dermatoses, Children, School, Prevalence

INTRODUCTION

Dermatological diseases are a major health problem in all age groups, more so in pediatrics. They are associated with significant and bothersome morbidity. School-based surveys previously undertaken throughout India suggest prevalence of pediatric dermatoses ranging from 5 % to 50%.^{1,2}

Pediatric dermatoses vary in clinical features, treatment, and prognosis from adult dermatoses and therefore have to be addressed in a different way. A variety of skin disorders are seen during childhood, with diverse patterns of presentation and prevalence that can be attributed to differing climatic, cultural, and socioeconomic factors.

Thus infections, infestations and malnutrition related dermatoses being more prevalent in Backward and Developing Tropical Afro-Asiatic- South American regions; while eczemas, hypersensitivity and autoimmune conditions are more common in Developed Temperate Eurasians- North American and Tasmanian regions.^{1,3,4}

Skin diseases often are a key to the Pandora's box of systemic maladies and offer diagnostic tips and clues to major systemic disorders. Skin diseases like Metabolic disorders, Connective tissue disorders like Lupus erythematosus, neonatal skin disorders and various skin tumors may entail a battery of clinical and laboratory investigation for diagnosis and management. On the other hand, skin diseases like atopic dermatitis, acne vulgaris,

psoriasis, pityriasis alba, photo dermatosis etc. can be quickly diagnosed by their clinical features and need little or no further investigations.³⁻⁵

An essential component of understanding and managing dermatoses is health education with specific active focus on personal hygiene, living spaces and overcrowding, environmental sanitation and nutrition. If proper measures are not taken for keeping the body and surroundings clean, the body is liable to various skin infections, infestations and diseases, as skin is the primary protective barrier. This is bound to hamper the physical well-being of the individual and community and society at large.^{2,4,5}

In children, dermatological disorders cause considerable discomfort, morbidity, parental anxiety, unnecessary absence from school and other psychosocial side effects such as embarrassment, feeling of stigmatization, loss of confidence and disruption of social relations.^{3,4}

It is believed that dermatological problems constitute at least 30% of all outpatient visits to a pediatrician and 30% of all visits to a dermatologist involve children.⁶

We carried out this study to assess the prevalence of pediatric dermatoses which forms the foundation on which further strategies of preventive and curative nature can be planned and designed.

Bangalore is one of the fastest growing cities in the world and with a large migrant population. It is a landlocked city in the tropical region, a plateau at about 3000ft above sea level and recently facing water shortage, decreasing green cover and pollution related issues. Bangalore has also been described as the allergic capital of India. All these factors contribute to Bangalore and its growing peripheries being a cooking pot for various ailments-infective, allergic and autoimmune disorders.

Aim and objective

This is a novel study that aims at simultaneously comparing the prevalence and distribution of dermatoses in hospital and community among children of age 5-16 years in rural Bangalore.

The objective of the study was to estimate the prevalence and identify the spectrum of distribution dermatoses among children of age 5-16 years visiting our outpatient department and comparing with school children of the same age group in government school in our area.

METHODS

The current research was cross sectional, prospective type descriptive study conducted for the duration of one week from third week of July, 2019 at outpatient department, pediatrics and dermatology, East point hospital,

Bangalore and Kannurahalli Government school, Bangalore rural district.

Inclusion criteria were, all children of 5 to 16 years age group presenting with complaints of dermatological problems to the outpatient departments of pediatrics and dermatology or asymptomatic and on examination detected to have dermatological problems and all children of 5 to 16 years age group attending the school with complaints of dermatological problems or asymptomatic but on examination detected to have dermatological problems.

Exclusion criteria were, children whose parents did not give consent for evaluation and children who were absent during the study period.

All children both in the outpatient department of hospital and school fulfilling the inclusion and exclusion criteria were included in the study. Basic details recorded were the age, sex, height and weight. They were subjected to systemic examination and a complete dermatological examination including skin, nail, hair and mucosa in adequate daylight. The diagnosis was made based on clinical features. The findings were recorded in a proforma for analysis.

For interpretation of data, the children were classified into 3 groups: primary school (5-10 years), middle school (11-14 years) and high school (14-16 years). Dermatoses were classified into three broad categories for the purpose of analysis: infectious dermatoses, noninfectious dermatoses, nutritional deficiency dermatoses.¹ Infectious were further subdivided into bacterial, mycosis, parasitic and viral infections.⁷ Non-infectious dermatoses were categorized into various groups.³

Statistical analysis

The data was compiled and analyzed using MS-EXCEL and SPSS 20. Chi-square test was used to compare categorical variables. $P < 0.05$ was considered to indicate statistical significance.

Ethical considerations

This was a prospective descriptive study. Consent was taken either from parents and/ or school teachers. The parents attending outpatient departments were counseled and written consent was obtained. The parents of school children were informed one week in advance through the school authorities and teachers.

RESULTS

Total number of children attending the outpatient department of age 5-16 years during the study period was 213. Out of these 74 children fulfilled the inclusion criteria. Two children with other complaints but detected

with dermatological conditions were excluded from the study as consent was not obtained.

Total number of children enrolled in Kannurahalli Government school were 67. Out of these 47 children fulfilled the inclusion criteria. Out of which five children were absent, three children did not give consent and eight children did not fulfill the age criteria during the study period. Thus, a total of 119 children of age 5–16 years were included in the study. Of these, 72 were from the outpatient departments of the hospital and 47 were from the school. The prevalence of dermatoses in the outpatient children is 72 out of 213 (33.8%) and school is 47 out of 67 (70.1%). This is statistically significant ($p < 0.00001$).

Out of 72 cases of dermatoses in the Outpatient of the hospital, 32 (44.4%) were males and 39 were females (54.1%). In the 47 cases of school community, 21 (44.7%) were males, 26 (55.3%) were females. The male female ratio is similar in both cases as 1:1.2.

The more common age group affected were primary school in the both groups. The mean age of pediatric dermatoses is 10.7 years in hospital and 10.3 years in the school which is comparable (Table 1).

Table 1: Demographic Details.

Parameter	Hospital	School
Children (n)	72	47
Male (M)	32	21
Female (F)	39	26
Mean age (years)	10.7	10.3
M:F Ratio	01:01.2	01:01.2
Infectious	33	13
Non-infectious	35	27
Nutritional	4	7
Primary school	35	22
Middle school	18	13
High school	19	12

The distribution among age groups was as follows. 35 (48.6%) were in primary school, 18 (25%) were in middle school and 19 (26.4%) were in high school age groups in outpatient department cases. In the school setting, 22 (47%) were in primary school, 13 (27.7%) in middle school and 12 (25.3%) in high school.

It was noted that in hospital 33 (45.8%) children had infectious dermatoses, 35 (48.6%) had noninfectious and four (5%) had nutritional dermatoses. Contrast to this, 13 (27.7%) school children had infectious dermatoses, 27 (57.4%) had non-infectious and seven (15%) had nutritional dermatoses. This was statistically significant ($p = 0.04$).

In the Outpatient departments of hospital, Infectious dermatoses were more common in males (54.4%)

(Figures 1 and 4). Among infections, bacterial infections were most common and about 45.5% and predominantly seen in primary school age group (46.6%). This was in contrast to school children where the most common infectious dermatoses were parasitic infestations (46.1%), more in females (83%) and predominantly in primary school age group (84.3%).

In hospital, the most common among non-infectious dermatoses were eczemas (45.7%), involving both males and females equally, mainly seen in primary school children (56.2%). Even in school, among the 57.4% of non-infectious dermatoses, eczematous lesions (40.7%) were most common (Figures 2 and 3), and were seen slightly more common in males (54.5%) and mainly in high school children (45.4%).



Figure 1: Clinical photograph demonstrating tinea capitis.



Figure 2: Clinical photograph demonstrating peri oral dermatitis.



Figure 3: Clinical photograph demonstrating pityriasis alba.



Figure 4: Clinical photograph demonstrating impetigo.

Nutritional dermatoses were seen affecting the girls more than boys (75%) in hospital set up, mainly in middle school (73%). Similarly, in the school study, it had

affected girls more than boys (57%), mainly in primary school (47.1%) (Table 2 and 3).

Table 2: Spectrum of pediatric dermatoses in hospital out-patient.

Variables	Total	Male	Female	Primary school	Middle school	High school
Infectious						
Bacterial	15	9	6	7	3	5
Fungal	10	2	8	3	2	5
Parasitic	1	1	0	0	1	0
Viral	7	5	2	3	1	3
Non-infectious						
Physiological	2	0	2	2	0	0
Eczematous	16	8	8	9	3	4
Pigmentary	2	0	2	1	0	1
Papulosquamous	4	2	2	2	1	1
Hypersensitive	4	2	2	1	2	1
Hair & scalp	4	0	4	4	0	0
Sweat gland disorders	2	0	2	2	0	0
Metabolic	1	0	1	1	0	0
Genetic	0	0	0	0	0	0
Nutritional	4	1	3	1	3	0
Total	72	30	42	36	16	20

Table 3: Spectrum of pediatric dermatoses in school.

Variables	Total	Male	Female	Primary school	Middle school	High school
Infectious						
Bacterial	4	2	2	3	1	0
Fungal	2	2	0	0	2	0
Parasitic	6	1	5	5	1	0
Viral	1	0	1	0	0	1
Non-infectious						
Physiological	0	0	0	0	0	0
Eczematous	11	6	5	3	3	5
Pigmentary	1	0	1	0	1	0
Papulosquamous	1	1	0	0	1	0
Hypersensitive	4	1	3	2	1	1
Hair & scalp	2	2	0	0	0	0
Sweat gland disorders	1	0	1	0	1	0
Metabolic	3	1	2	2	1	0
Genetic	4	2	2	3	0	1
Nutritional	7	3	4	4	1	2
Total	47	21	26	22	13	10

DISCUSSION

Most of the time, dermatoses in children are undetected and neglected, may be the harbinger and marker of many sinister morbid diseases and disorders. Socio-demographic factors such as age, gender, economic status, and overcrowding play a crucial role in determining the pattern of dermatoses.^{2,3}

Primary prevalence data is important in treating as well as planning public health strategies intended to combat and control dermatoses. Basic prevalence data is still emerging and enumeration of dermatoses is still at its infancy in India though pediatric dermatological problems constitute at least 30% of all outpatient visits to pediatrician and dermatologists.⁶

Prevalence of dermatoses in school in our study is 70%. Other studies based on school survey prevalence ranges

from 14.3% to 76.65%.^{8,9} Few of the other study rates as follows: Dogra et al (38.3%), Kohli et al (48.3%), Jose et al (68.2%), Valia et al (53.6%).^{1,5,10,11}



Figure 5: Clinical photograph demonstrating atopic dermatitis.



Figure 6: Clinical photograph demonstrating impetigo of the nose.

In our school study, noninfectious dermatoses are the most common and comprising about 57.4%. This is identical to 58% reported by Kohli et al which was conducted in Jaipur.⁵ Even the prevalence of infectious dermatoses (~50%) correlates to previous published results.^{1,12}

Our findings of infectious dermatoses being due to parasitic infestations, more in females and primary school group validates the findings of previous studies.^{1,10,13} Though this is in variance with findings of other studies which were carried out in Jaipur and Varanasi.^{5,11}

In our school study, among the noninfectious dermatoses (57.4%), the most common are eczematous lesions (40.7%), which are slightly more common in males (54.5%) and mainly affecting the children of high school (45.4%). This is similar to previous studies.⁵

The sex distribution in our study shows a slight female preponderance similar to reported by earlier studies like Karthikeyan et al.¹⁴ Most other studies suggest equal or slight male preponderance.¹

Out of 72 cases of dermatoses in the hospital, the age group mostly affected is primary school with 48.6%, and high school group comprising of 26.4%. This is in contrast to the majority of 48% adolescents in Reddy et

al, Sharma et al.^{6,8} Females at 54.1% outnumbered males, similar to Reddy et al and Karthikeyan et al.^{6,14}

In our study the prevalence of noninfectious dermatoses (49%) was marginally more than infectious dermatoses (46%) in hospital. This was in variance with Reddy et al whose report explains slightly higher infectious (34%) compared to noninfectious (33%) dermatoses.⁶

In hospital, Infectious dermatoses were more common in males in our study as against females in Reddy et al. we find the most common is bacterial infection which is 45.5%, more in males 60%, predominantly in primary school age group (46.6%). Reddy et al report fungal infections followed by viral and bacterial.⁶

Among children visiting the outpatient department, the most common noninfectious dermatoses are eczematous lesions in the present study which is similar to studies of Reddy et al and Sacchidanand et al.^{6,15}

The present study recorded around 5% and 15% of nutritional dermatoses in hospital and community respectively. Other studies report rates from 1% by Reddy et al, 3% by Karthikeyan et al, 15.4% of Bisht et al and 17.5% of Negi et al.^{6,14,16,17}

Limitations of study

Our study had some limitations like it was conducted in a single tertiary care referral hospital and single government school. Study period was short and it was monsoon season. Sample size was small. No laboratory tests were done for confirmation of diagnosis.

CONCLUSION

Pediatric dermatoses are neglected, often overlooked and under estimated, burdening the health system. Even basic prevalence data is not adequately available to quantify the disease burden in India. This small study is novel as it tries to compare the prevalence of dermatoses in school going children visiting the hospital outpatient simultaneously with the school in the community. The results suggest children at hospitals with skin complaints are the tip of the iceberg of dermatoses prevalent in the community.

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Ethical approval: The study was approved by the institutional ethics committee

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