

**STUDY ON NONINFECTIOUS DERMATOSES IN PAEDIATRIC AGE**Ananthi Mahalingam<sup>1</sup>, Subha Ramasam<sup>2</sup>, Suganthy Valavan<sup>3</sup><sup>1</sup>Assistant Professor, Department of Dermatology, Government Villupuram Medical College and Hospital, Villupuram, Tamilnadu.<sup>2</sup>Assistant Professor, Department of Dermatology, Government Villupuram Medical College and Hospital, Villupuram, Tamilnadu.<sup>3</sup>Assistant Professor, Department of Dermatology, Government Villupuram Medical College and Hospital, Villupuram, Tamilnadu.**ABSTRACT****BACKGROUND**

Paediatric dermatology is a unique subspecialty in that child is not a miniature adult. Paediatric dermatoses differ from that of the adults in clinical presentation, treatment and prognosis. Various studies from India have shown infections and infestations to be the most common paediatric dermatoses. This study was planned to determine the epidemiological pattern of common noninfectious dermatoses in our paediatric patients as no such data are available from this part of the country.

A cross-sectional study was undertaken to study the prevalence of the noninfectious dermatoses in all the new paediatric patients attending the Skin Outpatient Department (OPD) at Villupuram Medical College over a period of three years.

**MATERIALS AND METHODS**

A total number of 550 children in the age group ranging from newborn to 12 years with noninfectious dermatoses attending the OPD for the first time were enrolled in the study.

**RESULTS**

Physiological changes of skin was the most common dermatoses in the newborn age group, while eczema was the most common dermatoses in infants, preschool and school going children. In the infants, eczema was followed by pigmentary disorders, mongolian spots, vascular nevi, ichthyosis, epidermolysis bullosa, alopecia areata and papular urticaria in the order of prevalence. Among preschool going children, eczema was followed by papular urticaria, papulosquamous disorders, pigmentary disorders, hair disorders, nevi, drug reactions, keratinisation disorders, urticaria, etc. In the school going age group, eczema was followed by papulosquamous disorders, pigmentary disorders, papular urticaria, nutritional disorders, ichthyosis, nevi, miliaria, drug reaction, hair disorders, photodermatoses, urticaria, collagen vascular disease and vascular nevi in the order of prevalence.

**CONCLUSION**

Eczema, papulosquamous disorders, papular urticaria, pigmentary disorders seem to be the most common noninfectious dermatoses in children. However, further studies in large scale are required to throw more light on the prevalence of these conditions.

**KEYWORDS**

Noninfectious Dermatoses, Newborn, Infants, Preschool, School Going Children.

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**BACKGROUND**

Dermatology is an ever expanding medical science with many subspecialties growing at a rapid pace and one such is Paediatric Dermatology. Since 1975, there has been an increased interest in this discipline both at national and international levels. The child is not a miniature adult. Various factors like age, thin skin and increased body surface to weight ratio in infants, clinical presentation, drug dosage,

etc. have specific implications in the treatment of paediatric dermatological conditions.

**Epidemiology of Paediatric Dermatoses-** In India, various studies have been done based on the pattern of dermatoses in school going children of both urban and rural areas, in hilly areas and in tertiary care hospitals. These studies have shown that there is a difference in prevalence of dermatoses in different regions of our country. Various Indian studies have shown infections and infestations to be the predominant dermatoses. There is paucity of studies on the pattern of noninfectious paediatric dermatoses from Tamil Nadu. This study was planned to determine the epidemiological pattern of common noninfectious dermatoses in all our newly-registered paediatric patients in the various age groups like neonates, infants, preschool and school going children attending the Skin Outpatient Department (OPD), as these data may form basis for future academics, research and improvisation of health services.

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**MATERIALS AND METHODS**

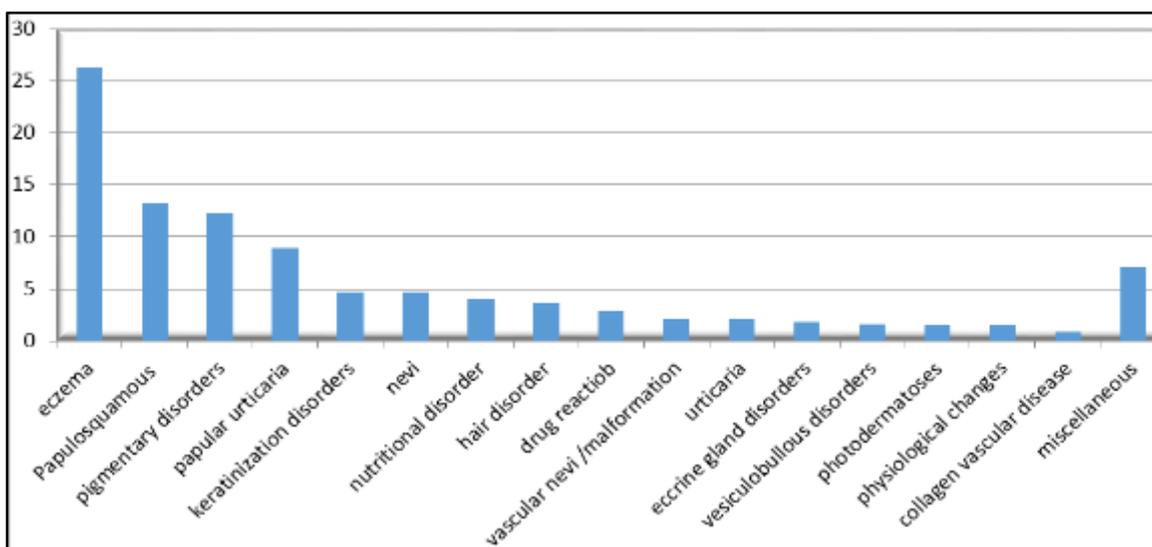
A cross-sectional study was conducted to include all the newly registered paediatric patients less than 12 years of age attending the Dermatology Outpatient Department (OPD) at Government Villupuram Medical College over a period of three years. This institute serve as a main tertiary level referral centre for Villupuram District, Tamil Nadu. Ethical clearance was obtained from the institution ethical committee. Five hundred and fifty patients with noninfectious dermatoses were enrolled in the study after obtaining informed consent from the parents. In all these children, based on the need, relevant laboratory investigations were done to rule out infections and to confirm the diagnosis whenever indicated.

**RESULTS AND OBSERVATIONS**

The total number of patients under our study was 550, demographic profile of which is given in Table 1. Out of 550 children, males constituted 296 (53.82%) and females 254 (46.18%). The maximum number of children belonged to the school going age group 261 (47.45%) and least were found in the neonatal age group, 16 (2.91%). Two hundred and forty two (44%) children were born of consanguineous marriage. Out of the 550 patients, 190 (34.55%) patients have been referred to these institutes and of which 165 (30%) patients have been referred from primary health centres. The overall pattern of noninfectious dermatoses observed is given in Table 2 and Chart 1.

Age	Years	Male	Female	Total	Percentage
Neonates	1-28 days	9	7	16	2.91%
Infants	28 days - 1 year	38	30	68	12.36%
Preschool children	1 year - 5 years	95	110	205	37.27%
School children	5 years - 12 years	154	107	261	47.45%

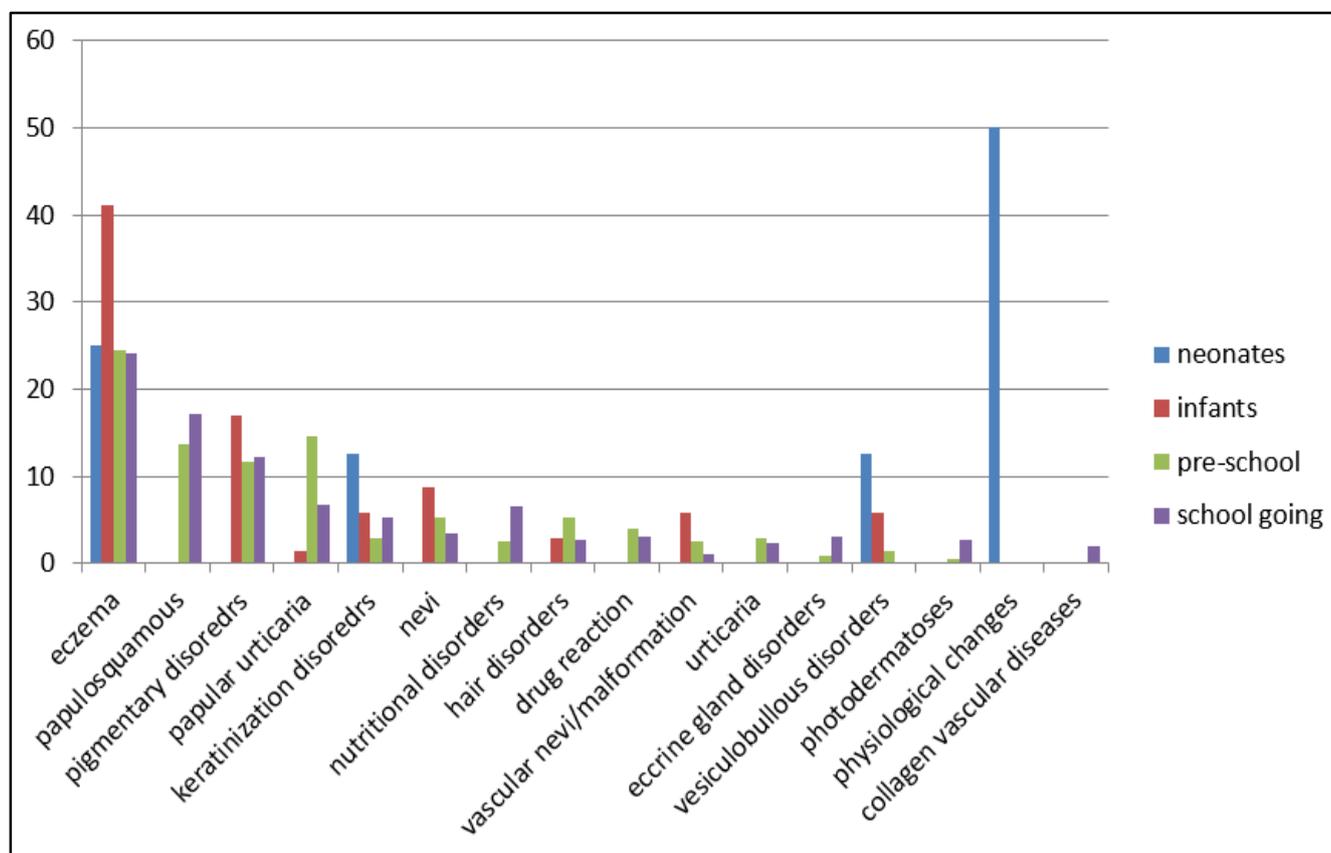
**Table 1. Demographic Profile of Study Patients**



**Chart 1. Prevalence of Noninfectious Dermatoses in Paediatric Age Group**

Sl. No.	Diagnosis	Number of Children (n=550)	Prevalence
1.	Eczema	145	26.36
2.	Papulosquamous disorders	73	13.27
3.	Pigmentary disorders	68	12.36
4.	Papular urticaria	49	8.91
5.	Disorders of keratinisation	26	4.73
6.	Nevi	26	4.73
7.	Nutritional deficiency disorders	22	4.0
8.	Hair disorders	20	3.63
9.	Drug reactions	16	2.91
10.	Vascular nevi and malformation	12	2.18
11.	Urticaria/angioedema	12	2.18
12.	Eccrine gland disorders	10	1.82
13.	Vesiculobullous disorders	9	1.64
14.	Photodermatoses	8	1.45
15.	Physiological changes in neonates	8	1.45
16.	Collagen vascular disease	5	0.9
17.	Genodermatoses	2	0.3
18.	Miscellaneous disorders	39	7.09

**Table 2. Prevalence of the Noninfectious Dermatoses in Children**



**Chart 2. Age Group wise Pattern of Noninfectious Dermatoses**

Age group wise pattern of noninfectious dermatoses is given in Chart 2. Eczema was found to be the commonest noninfectious dermatoses (26.36%). Among eczemas, atopic dermatitis was the most common. Papulosquamous disorders (13.27%) were the next common, among which, lichen planus was the most common papulosquamous disorder observed. Commonest of the pigmentary disorders (12.36%) observed was vitiligo. Next, common to pigmentary disorders was papular urticaria 49 (8.91%). Among the disorders of keratinisation (4.73%), ichthyosis was found to be the commonest. Mongolian spots was found to be the most common in nevi. Among the disorders affecting the hair (3.63%), alopecia areata was most common. Phrynoderma was found to be the commonest among the nutritional disorders (4%). Among the drug reactions (2.91%), morbilliform drug eruptions was found to be the commonest. Haemangioma was the most common among the vascular nevi. Urticaria was more common than angioedema. Mechanobullous disorder was common among the vesiculobullous disorders. Of the sweat gland disorders (1.82%), miliaria was the commonest to be observed. Among the photodermatoses (1.45%), polymorphous light eruption was commonly encountered. Other significant conditions observed were morphea and ectodermal dysplasia.

**Noninfectious Dermatoses in Various Age Groups Neonates**

There were 16 (2.91%) neonates in the study group and the commonest dermatosis was physiological skin changes seen

in 8 babies (50%), followed by cradle cap in 4 babies (25%). Other dermatoses observed were epidermolysis bullosa 2 (12.5%), collodion membrane 1 (6.25%) and harlequin ichthyosis 1 (6.25%) (Table 3).

Sl. No.	Diagnosis	Number of Cases (n=16)	%
1.	Physiological changes in neonates	8	50
2.	Cradle cap	4	25
3.	Epidermolysis bullosa	2	12.5
4.	Collodion baby	1	6.25
5.	Harlequin ichthyosis	1	6.25

**Table 3. Prevalence of Dermatoses in the Neonatal Age Group**

**Infants-** Among the 68 (12.36%) infants, eczema was the commonest dermatosis seen in 28 (41.18%) babies. Seborrheic dermatitis 13 (19.12%) was the most common followed by atopic dermatitis 11 (16.18%) and diaper dermatitis 4 (5.88%). Pigmentary disorders 12 (17.65%) were found to be common next to eczema, followed by mongolian spots 6 (8.82%), vascular naevi 4 (5.88%), ichthyosis 4 (5.88%), epidermolysis bullosa 4 (5.88%), alopecia areata 2 (2.94%) and papular urticaria 1 (1.47%). Nevus depigmentosus was the commonest 8 (11.76%) among the pigmentary disorders to be followed by addisonian pigmentation 2 (2.94%) and post-inflammatory hyperpigmentation 2 (2.94%) (Table 4).

Sl. No.	Diagnosis	No. of Cases (n=68)	%
1.	Eczemas	28	41.18
2.	Pigmentary disorders	12	17.0
3.	Mongolian spot	6	8.82
4.	Vascular nevi	4	5.88
5.	Ichthyosis	4	5.88
6.	Epidermolysis bullosa	4	5.88
7.	Alopecia areata	2	2.94
8.	Papular urticaria	1	1.4
9.	Miscellaneous	7	10.3

**Table 4. Prevalence of Noninfectious Dermatoses in the Infants**

**Preschool Children-** Among the 205 (37.27%) children, eczema 50 (24.39%) was the commonest dermatosis of which atopic dermatitis 20 (9.76%) was the most common. Next common to eczema was papular urticaria 30 (14.63%) followed by papulosquamous disorders 28 (13.66%). Among the latter, most common was pityriasis rosea 14 (6.83%) followed by lichen planus 6 (2.93%), lichen nitidus 4 (1.95%) and psoriasis 4 (1.95%) (Table 5).

Sl. No.	Diagnosis	No. of Children (n=205)	%
1.	Eczema	50	24.39
2.	Papular urticaria	30	14.63
3.	Papulosquamous disorders	28	13.66
4.	Pigmentary disorders	24	11.71
5.	Hair disorders	11	5.36
6.	Nevi	11	5.36
7.	Drug reactions	8	3.90
8.	Keratinisation disorders	6	2.93
9.	Urticaria	6	2.93
10.	Vascular nevi	5	2.44
11.	Nutritional disorders	4	2.44
12.	Vesiculobullous disorders	3	1.46
13.	Miliaria	2	0.9
14.	Photodermatoses	1	0.45
15.	Miscellaneous	16	6.83

**Table 5. Prevalence of Noninfectious Dermatoses in the Preschool Children**

**School Going Children-** Among the 261 school going children, eczema 63 (24.14%) was the commonest followed by papulosquamous disorders (Table 6).

Sl. No.	Diagnosis	No. of School Children (n=261)	%
1.	Eczema	63	24.14
2.	Papulosquamous disorders	45	17.24
3.	Pigmentary disorders	32	12.26
4.	Papular urticaria	18	6.7
5.	Nutritional deficiency	17	6.51
6.	Ichthyosis	14	5.36
7.	Nevi	9	3.45
8.	Miliaria	8	3.07
9.	Drug reactions	8	3.07
10.	Hair disorders	7	2.68
11.	Photodermatoses	7	2.68
12.	Urticaria	6	2.30

13.	Collagen vascular disease	5	1.92
14.	Vascular nevi	3	1.15
15.	Miscellaneous	19	7.28

**Table 6. Noninfectious Dermatoses Seen in School Going Children**

Lichen striatus was the most common 20 (7.66%) among the eczematous conditions. Of the papulosquamous disorders 45 (17.24%), which was next common, lichen planus 16 (6.13%) was the commonest followed by psoriasis 13 (4.98%). Vitiligo 18 (6.9%) was the commonest pigmentary disorder seen. Papular urticaria was seen in 18 (6.7%) children. Ichthyosis was the commonest disorder of keratinisation. Alopecia areata was the most common hair disorder observed. Polymorphic light eruption was the commonest photodermatoses observed.

**DISCUSSION**

Our study is a medical institute based study as it was done at tertiary level referral centres of Villupuram District, Tamil Nadu.

Epidemiological studies on paediatric dermatoses by Sardana K et al from a large paediatric hospital at New Delhi.<sup>1</sup> The study by Ghosh et al from the eastern part of India<sup>2</sup> and the study by Karthikeyan K et al from a referral centre of South India<sup>3</sup> have all shown eczema to be the most common dermatoses among the noninfectious dermatoses, which is consistent with our study, which showed a prevalence of 26.36%. In our study, Atopic Dermatitis (AD) was the commonest in the eczematous dermatitis. With respect to atopic dermatitis, epidemiological studies across the country have shown varying results. A hospital-based study showed a prevalence of 29.9%<sup>4</sup> and a similar study by Dhar S et al showed only 0.55%.<sup>5</sup> This difference may be due to interplay of various factors like food, environment and behavioural factors, which vary with different regions of the country. Our study showed a prevalence of 6.9%, which was close to the prevalence of atopic dermatitis (5.27%) in the study by Sardana K et al.<sup>1</sup> The study on atopic dermatitis by Dhar S et al had shown a family history of atopy in 65% of patients,<sup>6</sup> which is close to our study, which revealed 65.79% of atopic patients to have family history. Study by Sarkar R et al had shown that face was the common site of involvement in the infantile type of atopic dermatitis and Dhar S et al had shown a 35% of flexural involvement in childhood AD.<sup>7</sup> Our study had shown that 100% of infants had facial involvement, while flexural involvement was found in 26.31% of AD patients. Literature states that in India, minor forms of atopic dermatitis like pityriasis alba, forefoot eczema and perioral dermatitis are more prevalent than the full form of atopic dermatitis.<sup>7</sup> In our study, pityriasis alba was seen in 5.27%, forefoot eczema in 1.64% and perioral dermatitis in 1.27% of patients. In our patients with lichen striatus, upper limb (73.07%) was the common site of involvement as has been described in literature.<sup>8</sup>

Our study showed seborrheic dermatitis to be present in only 3.45%, which was much less compared to the study by Sardana K et al, which showed 10.49%.<sup>2</sup> Literature states

that diaper dermatitis is common and is present in 35% of infants.<sup>9</sup> In our study, diaper dermatitis was present only in 0.7%, which is low compared to literature. This low prevalence maybe explained by the infrequent use of disposable diapers amidst the middle and low socioeconomic population, which happens to be the study group. Our study showed a very low prevalence of contact dermatitis of 1.09% as against 13.3% to 67%<sup>10</sup> shown by Roul S et al. Sharma K et al showed nickel to be the commonest allergen<sup>11</sup> inconsistency with our study in which 50% of patients with contact dermatitis had allergic dermatitis to the nickel-coated jewellery. This was followed by 33.33% patients presenting with allergic contact dermatitis to footwear.

With respect to papulosquamous disorders, a study from Turkey showed a prevalence of 6.9%,<sup>12</sup> whereas our study showed a high prevalence of (13.27%) with lichen planus being the commonest condition. Kanwar et al reported prevalence of 7.5%, which was almost close to our prevalence rate of 4%.<sup>13</sup> With regard to the morphological types, Kanwar et al<sup>14</sup> reported 42-76% of classical type and 12% of hypertrophic type, whereas Nanda A et al had reported 13% of eruptive type.<sup>15</sup> In our study, the most common clinical variant was classical type (54.54%) in consistence with Kanwar et al followed by the eruptive type 27.27%, which was higher than that reported by Nanda et al. Prevalence of hypertrophic type of lichen planus in our study was 18.18%, which was almost close to the 12% reported by Kanwar et al.

Karthikeyan et al reported childhood psoriasis to constitute 1.4% of the total dermatoses,<sup>3</sup> while our study showed a prevalence of 3.09%. The difference in the prevalence rate maybe due to the difference in the study groups as our study group consisted only of patients with noninfectious dermatoses unlike their study group, which included patients with infectious and noninfectious dermatoses. Kumar et al have reported chronic plaque type psoriasis as the commonest type followed by the guttate psoriasis and they have also reported a high prevalence (12.8%) of plantar psoriasis.<sup>16</sup> Our study showed plaque type to be the commonest with 58.82%, plantar psoriasis (23.53%) and guttate psoriasis (17.65%). The higher prevalence of plantar psoriasis than guttate psoriasis in our study is consistent with the study by Kumar et al, who had attributed the increased occurrence of plantar type to the habit of walking barefoot in our country, which can act as Koebnerization and the decrease in guttate psoriasis to repeated subclinical infections, which may not allow building up of critical level of streptococcal antigen required to trigger guttate psoriasis in our community.<sup>16</sup> Study by Karthikeyan K et al<sup>3</sup> had shown the prevalence of pityriasis rosea to be 0.2% in contrast to our study, which showed an increased prevalence of 3.45%.

The study by Negi KS et al reported that pigmentary disorders were present in 7%<sup>17</sup> and in Karthikeyan K et al study it was 5.7%<sup>3</sup> in contrast to our study, which showed an increased prevalence of 12.8%. The study from eastern

India showed vitiligo of 3.4%,<sup>2</sup> but our study showed an increased prevalence of 5.09%.

In the study by Karthikeyan et al, papular urticaria constituted 5.27%<sup>3</sup> and the study by Sardhana K et al showed 3.68%,<sup>1</sup> but our study showed an increased prevalence of 8.91% and this increased prevalence can be attributed to the poor sanitation conditions and the dressing habits with more body sites exposed for insect bites. Literature states that papular urticaria is a manifestation of atopic dermatitis and our study showed that 100% of bullous papular urticaria patients had family history of atopy, elevated serum IgE and absolute eosinophil count, which emphasises the need to suspect atopy in exaggerated papular urticaria patients with bullous lesions.

Literature states that among the disorders of keratinisation, ichthyosis is the commonest of which ichthyosis vulgaris is the most common.<sup>18</sup> Similarly, our study showed that ichthyosis vulgaris was the most common and was present in 52.63% of children. 66.66% of them had family history. This was followed by lamellar ichthyosis, which was 36.84% and 100% of them were born of consanguineous marriage.

Literature states that haemangiomas are the commonest tumours in children present in 1% to 3% of them.<sup>19</sup> Our study showed a prevalence of 1.81% of haemangiomas in accordance with the literature. In the study by Senthilkumar et al, they reported the commonest site of involvement to be head and neck with 88.2% being superficial haemangioma.<sup>20</sup> Our study showed 80% of haemangiomas to be present on the head and neck region and all were superficial (100%) clinically, which was almost consistent with the study by Senthilkumar et al. The only vascular malformation seen was salmon's patch, which the literature states to be the commonest.<sup>21</sup>

Our study showed urticaria to be prevalent in 2.18% of the children, which is in accordance with the study by Karthikeyan et al<sup>3</sup> who reported a prevalence of 2.8%. In this study, drug reactions was seen in 2.91% of children, which was higher than 0.3% reported by Karthikeyan et al<sup>3</sup> and lower than 9% reported by Sardhana et al.<sup>1</sup>

With respect to nutritional disorders, study by Negi KS et al<sup>17</sup> reported a prevalence of 17.5%, whereas the study by Karthikeyan K et al showed 2.8%. Our study showed a prevalence of 4%, which was closer to that reported by Karthikeyan et al. With regard to the hair disorders, Negi et al<sup>17</sup> observed hair involvement in 6.2% of children, while the hair disorders in our study accounts to 4%, which is in consistent with Negi et al. Among the hair disorders, alopecia areata was the commonest with the rare childhood pattern, ophiasis seen in one child. Tractional alopecia along the hair margins was seen in 0.5% of the children, which can be attributed to the practice of tying the hair pulled up tightly. With respect to Nevi, the study by Sardana et al<sup>1</sup> showed a prevalence of 2.23%, but our study showed an higher prevalence of 4.73%. Senthilkumar et al<sup>22</sup> from Jipmer have reported mongolian spot to be the commonest among the melanocytic nevi, similar to our study, which showed mongolian spots to be the commonest with 38.46%

and with 100% involvement of the back in consistence with literature.<sup>23</sup>

With respect to vesiculobullous diseases, which is a rare entity in childhood dermatoses, we observed a prevalence of 1.64% in our study and it is even more interesting to note that out of the 550 patients, 7 were babies with epidermolysis bullosa (1.27%) and 2 with chronic bullous disorder of childhood (0.3%). There is paucity of epidemiological data of these diseases in various studies on paediatric dermatoses from our country. Various studies have reported prevalence of eccrine gland disorders ranging from 2.8%<sup>23</sup> to 5.46%,<sup>2</sup> but our study showed only 1.82%. In the study by Karthikeyan et al, there is a report of 2.1% of genodermatoses, 0.5% of collagen vascular disease and 2.4% of photodermatoses,<sup>4</sup> while our study showed a prevalence of 0.3% of genodermatoses, 0.95% of collagen vascular disease and 1.45% of photodermatoses.

Regarding the pattern of dermatoses in various age groups, our study showed that different age groups showed different patterns of dermatoses and this can be explained by the fact that the anatomy, physiology, immunology of the skin and exposure to various external factors like climate, food, allergens, etc. varies with the age.

Our study showed that in neonates, the physiological changes of skin (37.5%) had been the commonest dermatoses, but this is less compared to the various studies from India, but our study had rare cases like epidermolysis bullosa (12.5%), collodion baby (6.25%) and harlequin ichthyosis (6.25%) in the neonatal age group. This can be explained by the fact that as this study has been conducted at a tertiary level referral hospital.

With respect to other dermatoses, it is observed that eczema had been predominant in the infants, preschool and school going age group. With respect to seborrheic dermatitis, our study showed that neonates presented with cradle cap and infants with lesions over the scalp, flexures and trunk, but there was absence of seborrheic dermatitis in the preschool children, but was present in the school going age group, which can be explained by the action of hormones at the various stages of growth.

It has been observed that there has been a rise in seeking medical care for pigmentary disorders in children belonging to all the age groups. Among the pigmentary disorders, vitiligo was the commonest and this can be attributed to the concern of appearance and social stigma attached to white patches in this part of the country. Our study showed that there has been increased prevalence of genetically transmitted disorders like ichthyosis vulgaris, lamellar ichthyosis, erythrokeratoderma, palmoplantar keratoderma, epidermolysis bullosa and rare disorders like ectodermal dysplasia, xeroderma pigmentosum and this can be explained by the fact that consanguineous marriages are more prevalent in this part of the country in addition to the study being done in tertiary level hospitals. In our study group, 44% of children were born of consanguinity. This emphasises the need to increase the awareness about the adverse effects of consanguineous marriage in the community and to strengthen genetic counselling and

prenatal diagnostic techniques, so as to ensure a healthy paediatric population for a healthy India.

## CONCLUSION

With regard to dermatoses in the various age groups, it was found that, in neonates the commonest dermatoses was physiological skin changes, followed by cradle cap. Rare disorders like epidermolysis bullosa, collodion baby and harlequin ichthyosis were encountered. Eczema was the commonest dermatoses in infants followed by pigmentary disorders, mongolian spots, vascular nevi, ichthyosis, epidermolysis bullosa, alopecia areata and papular urticaria in the order of prevalence. Among the preschool going children, the commonest dermatoses was eczema followed by papular urticaria, papulosquamous disorders, pigmentary disorders, hair disorders, nevi, drug reactions, keratinisation disorders, urticaria, vascular nevi, nutritional disorders, vesiculobullous disorders, miliaria and photodermatoses in the order of prevalence. In the school going age group, the commonest dermatoses was eczema followed by papulosquamous disorders, pigmentary disorders, papular urticaria, nutritional disorders, ichthyosis, nevi, miliaria, drug reaction, hair disorders, photodermatoses, urticaria, collagen vascular disease and vascular nevi in the order of prevalence. This study is the first of its kind to be done on only noninfectious paediatric dermatoses. Further studies on noninfectious paediatric dermatoses will throw more light on the prevalence of these conditions in our country.

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