

Original Research Article

Spectrum and pattern of pediatric dermatoses in under five population in a tertiary care centre

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ABSTRACT

Background: Pediatric dermatoses vary vastly from adult dermatoses in terms of clinical presentation, treatment and prognosis, thereby generating special interest in this field. The present study was carried to find out the spectrum, pattern and incidence of various skin disorders in infants and preschool children (upto 5 years), to correlate their prevalence with age, sex and rural/urban residential status.

Methods: 1000 children under five years age, were evaluated for the presence of skin disease to study the pattern and incidence of these disorders and establish their relationship with age, sex and residential status (rural/urban). Skin disorders were described in detail and classified into groups like bacterial, fungal, parasitic, viral, eczematous, allergic, papulosquamous, pigmentary, miscellaneous.

Results: Maximum number of children belonged to age group of less than 1 year (31.6%). Male patients (56.6%) outnumbered female patients (43.4%). 56.8% children belonged to urban area while 43.2% children were from rural area. Maximum incidence was of infections (41.1%). Of these infections, bacterial infections (14.5%) were the predominant followed by parasitic infections (10.9%). Eczematous skin disorders were the next common entity after infections seen in 35.1 % children followed by that of allergic disorders seen in 5.9% children.

Conclusions: There is preponderance of infectious dermatoses among the under five population followed by eczematous and hypersensitivity disorders. The role of poverty, overcrowding, poor personal hygiene and low level of health education, undernutrition and consequent poor immunity are emphasized by these preventable diseases.

Keywords: Pediatric, Dermatoses, Under five population

INTRODUCTION

Cutaneous disorders in children are common and are either transitory or chronic and recurrent. Monitoring their epidemiology helps in effectively planning relevant educational programs and preventive measures.¹

Dermatological problems manifesting as primary and secondary cutaneous complaints constitute at least 30% of all outpatient visits to a pediatrician and 30% of dermatological outdoor consultation constitutes children.^{2,3}

Measurement of impact of pediatric dermatoses is an important component of primary health care practice and is required to aid for clinical research and for allocation of more resources for the care of the children. The evaluation for skin disorders are an important component of primary health care practice for all including children.⁴

Pediatric dermatoses vary vastly from adult dermatoses in terms of clinical presentation, treatment and prognosis, thereby generating special interest in this field and requiring a separate view. Socio-economic status, external environment, climatic exposure and dietary

habits are the more influential factors in dermatoses in children than adults.⁵

Different degrees of exposure to external factors and different levels of functional development of skin may give rise to differential prevalence of dermatoses among infants, toddlers and children.⁶

Various studies have reported a marked variation in incidence of skin diseases in children ranging from 9%-37%.⁷

METHODS

A prospective study was performed on infants and preschool children (upto 5 years of age) with complaints of skin diseases attending dermatology outpatient department of a tertiary care hospital, to find out the spectrum, pattern and incidence of various skin disorders, to correlate their prevalence with age, sex and rural/urban residential status and to compare the results with similar studies in the past. One thousand children aged upto 5 years of various dermatological disorders were included in the study. After detailed history and skin examination a clinical diagnosis was made. Routine investigations like Hb, TLC, DLC, urine C/E were done in every case. Other relevant special investigations according to the disease wherever necessary were done. The general hygiene of all children was observed at the time of examination and divided into two categories i.e. good and poor based on history of regular bathing habits, cleanliness and change of clothes. All the cases studied were grouped under the following headings:

- Group A:** Dermatoses caused by pyogenic bacteria.
- Group B:** Dermatoses caused by parasites.
- Group C:** Dermatoses caused by various fungal infections.
- Group D:** Various skin disorders caused by viral infections.
- Group E:** Diseases based on allergic mechanisms.
- Group F:** Disease due to nutritional deficiency.
- Group G:** Congenital malformations.
- Group H:** Skin disorders due to sexually transmitted diseases.
- Group I:** Papulosquamous disorders.
- Group J:** Vesiculobullous disorders.
- Group K:** Dermatitis and eczema.
- Group L:** Pigmentary disorders.
- Group M:** Hair and nail disorders
- Group N:** Cutaneous vascular disease, like purpuras, vasculitis, telangiectasia.
- Group O:** Miscellaneous skin disorders.

RESULTS

1000 children upto 5 years of age of both sexes of urban and rural areas with various dermatoses attending outpatient department of skin and VD, were included in the present study.

The children were placed into 5 sub groups of 1 year each as given in Table 1. Maximum number of children belonged to age group of less than 1 year (31.6%) and minimum number of children belonged to age group 1-2 years (9.4%). Male patients (56.6%) outnumbered female patients (43.4%) with male:female ratio of 1.3:1.

Table 1: Age distribution of 1000 children.

Age Groups (in years)	No. of cases	Age (%)
Upto 1 year	316	31.6
>1- 2	94	9.4
>2-3	165	16.5
>3-4	153	15.3
>4-5	272	27.2
Total	1000	100.0

56.8% children belonged to urban area while 43.2% children were from rural area. 63.4% were having good general hygiene whereas 36.6% were having poor hygiene. Out of 568 children living in urban area, 75.2% had good hygiene and 24.8% had poor hygiene whereas out of 432 children residing in rural area 48% had good hygiene and 52% had poor hygiene as shown in Figure 1. On statistical analysis it was observed that the difference of hygiene in urban and rural children was statistically significant (p value <0.01).

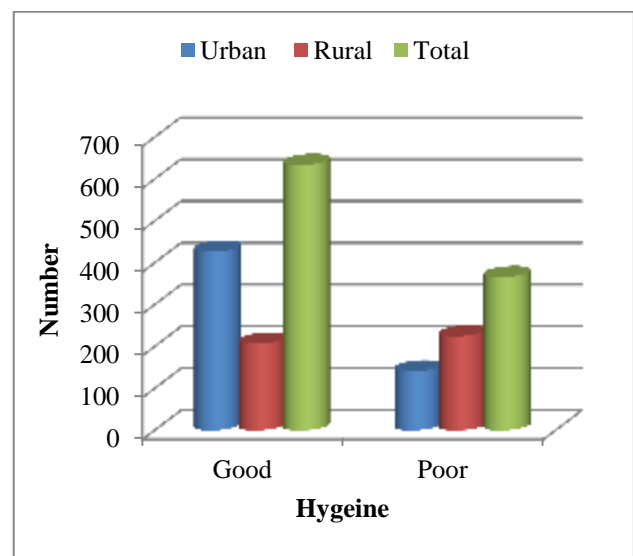


Figure 1: Relationship of hygiene with residential area of 1000 children.

Out of 1000 children, 41.1% had infective dermatoses which included bacterial, viral, fungal and parasitic infections. The remaining 58.9% had non infective variety of dermatoses. Of the children with infective dermatoses, 26.3% were males and 14.8% females. Among the non-infective dermatoses male children constituted 30.3% and females 28.6%.

Among infective dermatoses 17.5% cases were from urban area and 23.6% from rural area. 38.9% cases of non infective dermatoses were seen from urban area and 20% from rural area. Thus, infective dermatoses predominated in rural population and non-infective dermatoses predominated in urban population.

The pattern and incidence of various dermatoses in 1000 children was shown in Table 2. Maximum incidence was of infections (41.1%) that included bacterial, parasitic,

fungal and viral infections. Of these infections, bacterial infections (14.5%) were the predominant followed by parasitic infections (10.9%). Eczematous skin disorders were the next common entity after infections seen in 35.1% children followed by that of allergic disorders seen in 5.9% children. Bacterial, viral, parasitic infections, eczematous and allergic dermatoses were more common in males than females whereas fungal infections, congenital malformations, papulosquamous dermatoses and pigmentary dermatoses predominated in females.

Table 2: Pattern and sex incidence of various dermatoses in 1000 children.

Group	Dermatoses	Males		Females		Total	
		No.	%	No.	%	No.	%
A	Bacterial infections	104	10.4	41	4.1	145	14.5
B	Parasitic infections	66	6.6	43	4.3	109	10.9
C	Fungal infections	35	3.5	46	4.6	81	8.1
D	Viral infections	58	5.8	18	1.8	76	7.6
E	Allergic dermatoses	47	4.7	12	1.2	59	5.9
F	Nutritional dermatoses	6	0.6	6	0.6	12	1.2
G	Congenital malformations	13	1.3	35	3.5	48	4.8
H	Sexually transmitted infections	0	0.0	0	0.0	0	0.0
I	Papulosquamous disorders	5	0.5	14	1.4	19	1.9
J	Vesiculobullous disorders	4	0.4	3	0.3	7	0.7
K	Eczematous disorders	189	18.9	162	16.2	351	35.1
L	Pigmentary disorders	7	0.7	28	2.8	35	3.5
M	Hair and nail disorders	1	0.1	7	0.7	8	0.8
N	Cutaneous vascular diseases	2	0.2	2	0.2	4	0.4
O	Miscellaneous	29	2.9	17	1.7	46	4.6
	Total	566	56.6	434	43.4	1000	100

Table 3: Pattern of bacterial infections (n= 145).

Dermatoses	Urban		Rural		Male		Female		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Impetigo	32	38.09	52	61.90	53	63.10	31	36.90	84	57.93
Secondary pyoderma	10	27.78	26	72.22	28	77.78	8	22.22	36	24.83
Folliculitis	11	64.71	6	35.29	15	88.23	2	11.76	17	11.72
Paronychia	5	100	0	0	5	100	0	0	5	3.45
Scrofuloderma	3	100	0	0	3	100	0	0	3	3.07
Total n=145	61	42.07	84	57.93	104	71.72	41	28.28	145	100

Table 4: Pattern of eczematous dermatoses (n= 351).

Dermatoses	Urban		Rural		Male		Female		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Atopic dermatitis	104	53.89	89	46.11	91	47.15	102	52.85	193	54.98
Seborrhoeic dermatitis	32	51.61	30	48.39	41	66.13	21	33.87	62	17.66
Pityriasis alba	19	73.08	7	26.93	16	61.54	10	38.46	26	7.41
Nummular dermatitis	12	80	3	20	10	66.67	5	33.33	15	4.28
Pompholyx	9	81.82	2	18.18	4	36.36	7	63.64	11	3.13
Contact dermatitis	4	44.44	5	55.56	6	66.67	3	33.33	9	2.56
Intertrigo	5	50	5	50	7	70	3	30	10	2.85
Diaper dermatitis	14	82.35	3	17.65	12	70.59	5	29.41	17	4.85
Juvenile plantar dermatoses	4	50	4	50	2	25	6	75	8	2.28
Total	203	57.83	148	42.17	189	53.85	162	46.15	351	100

The pattern of bacterial infections was shown in Table 3. Of the total bacterial infections, incidence of impetigo as seen in Figure 2 was most common being 57.93%, secondary pyoderma 24.83%, folliculitis 11.72%, paronychia 3.45% and scrofuloderma was 3.07%. Of these 57.93% belonged to rural population and 42.07% belonged to urban population. The males (71.72%) largely outnumbered females (28.28%).



Figure 2: Impetigo contagiosa plaque with typical honey colored crusting on the chin of a 5 year old boy.

Of the parasitic infections (10.9%), 36.7% belonged to urban population and 63.3% belonged to rural population with statistically significant difference (p value <0.05) as in Figure 3. Of these parasitic infections, scabies was the predominant type seen in 103 cases of which 36.89% were urban and 63.11% were from rural population. The sex distribution of parasitic infections was not statistically significant.

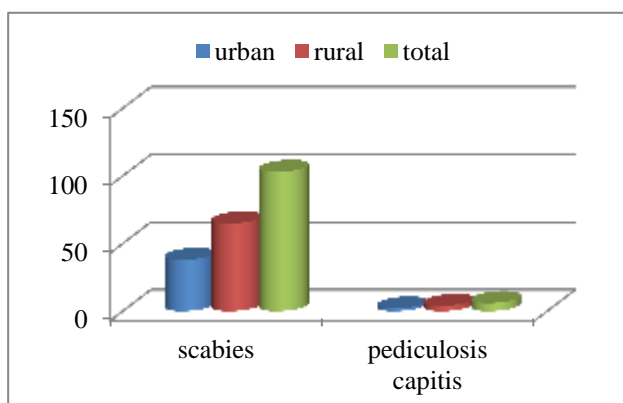


Figure 3: Relationship of parasitic infections with residential status.

Fungal infections were observed in 8.1%. Of the total fungal infections, *Tinea capitis* was the most common seen in 69.14% cases followed by *Tinea faciei* in 13.58% cases and *Tinea corporis* seen in 12.35% cases. *Tinea capitis* was more common in males seen in 30 out of 56 cases whereas *Tinea corporis* had equal sex incidence. Among children with *Tinea capitis*, grey patch was the

commonest variety followed by black dot and kerion. Candidiasis was also seen in 4 children.

7.6% cases belonged to viral infections. Of these, *Molluscum contagiosum* was the predominant type seen in 69.74% cases, followed by warts (28.95%). A single case of *Herpes zoster* was seen Figure 4. Viral infections were common in rural population with 60% cases belonging to the same. Males outnumbered females with 76.32% cases being males.



Figure 4: Herpes zoster grouped vesicles and bullae seen in dermatomal distribution over the left side of forehead, scalp and left eye in a 5 year old girl.

Eczematous disorders (35.1%) constituted the second most common dermatoses in the present study. Distribution of eczematous disorders is as shown in Table 4. Atopic dermatitis was the commonest entity comprising of 54.98% of this group. It was found to be more common in urban population with females outnumbering males. 102 out of 193 cases of atopic dermatitis had family history of atopy and 75 cases had personal history of atopy. The aggravating factors included winter season, woollen clothes, exposure to pets and sweating. The second most common entity in the group was seborrheic dermatitis (17.66%) as shown in Figure 5 followed by pityriasis alba (7.41%). Diaper dermatitis was seen in 4.85% cases. No statistical significant difference (p value >0.05) was seen in distribution of eczematous disorders in urban/rural population and in sex distribution among the total cases.



Figure 5: Seborrheic dermatitis- plaques with greasy scales seen over the scalp and retroauricular area in a 5 year old girl.

Allergic/hypersensitivity dermatoses were seen in 5.9% cases. 55.93% of these were suffering from papular urticaria which was the commonest. It was found to be more common in males with 57.58% belonging to urban population. Urticaria was seen in 20.34% cases.

Among the congenital dermatoses (4.8%), maximum number of cases were of capillary hemangioma as in Figure 6 followed by congenital melanocytic nevi, nevus pigmentosus and a single case of spina bifida occulta.



Figure 6: Capillary hemangioma solitary, well defined, scarlet red plaque seen on the right leg in a 3 month old girl since birth.

3.5% cases had pigmentary disorders. Vitiligo was more common in females. There was statistically significant difference in sex distribution among total cases with p value <0.05 .

The papulosquamous disorders (1.9%) seen were lichen planus, psoriasis and pityriasis rosea. The nutritional dermatoses i.e. phrynodema and acrodermatitis enteropathica were observed in 1.2% cases. There were 0.7% cases belonging to vesiculobullous eruptions including 2 cases of epidermolysis bullosa simplex and one of epidermolysis bullosa simplex-mottled pigmentation. Hair and nail disorders were diagnosed in 0.8% cases and included children with alopecia areata, tractional alopecia, beau's lines and trachyonychia. Cutaneous vascular diseases included 4 cases of henoch schonlein purpura. Purpura was classically palpable with involvement of extensor surfaces of the legs.

Miscellaneous dermatoses (4.6%) constituted cases of ichthyosis vulgaris, miliaria rubra, milia, familial hypercholesterolemia, erythema multiforme and tuberous sclerosis.

DISCUSSION

Skin diseases in children are encountered frequently and their characterization is essential for the preparation of academic, research and health plans. The evaluation for skin disorders are an important component of primary health care practice for all including children.⁴ The

pattern of skin diseases in children, especially the under five population, is a consequence of poverty, malnutrition, environmental factors, overcrowding, poor hygiene, illiteracy and social backwardness in many parts of India. Thus, the status of health, hygiene and personal cleanliness of a society can be judged from prevalence of certain skin diseases in the under five population of the community.

The present study included 1000 children upto 5 years of age of both sexes of urban and rural areas with various dermatoses attending out patient department of Skin and VD at a tertiary care centre.

In our study, the analysis of age distribution showed that the maximum number of cases were in the age group of upto 1 year (31.6%), followed by age group of 4-5 years with 27.2% cases. The minimum number of cases were in the age group of 1-2 years with 9.4% cases. Male patients outnumbered female patients with male:female ratio of 1.3:1. Male preponderance was observed in some other studies also.^{1,8-11} Few studies in the literature have shown female preponderance.¹²⁻¹⁴ This may be due to gender bias in our society whereby parents are more concerned about male children. Urban to rural ratio was 1.31. Thus cases coming from urban area were more than rural area. It may be due to easy access to a tertiary health care center and better health awareness among urban subpopulation. Out of 568 children living in urban area, 75.2% had good hygiene and 24.8% had poor hygiene whereas out of 432 children residing in rural area, 47.92% had good hygiene and 52.08% had poor hygiene. This implies that people residing in urban area pay more attention to personal hygiene. On statistical analysis it was observed that the difference of hygiene in urban and rural children was statistically significant (p value <0.01).

Spectrum and incidence of pediatric dermatoses has varied in different studies all over the world. In our study, on the whole, non-infective dermatoses (58.9%) outnumbered infective dermatoses (41.1%). Similar observations have been reported in other studies also.^{1,4,9,11,12,15} Infectious and non-infectious nature of dermatoses depends upon many factors for e.g. type of population studied, location of study centre, climatic and socioeconomic factors, literacy etc. Urban people have better living standards, better environmental sanitation and better personal hygiene. So non-infective dermatoses may be common in these.

In our study, infectious dermatoses (41.1%) collectively constituted the maximum number of patients and included bacterial, parasitic, fungal and viral infections. Eczematous skin disorders were the next common entity after infections seen in 35.1% children followed by that of allergic disorders seen in 5.9 % children. Similarly, Sardana et al found infections and infestations as the most common entity, followed by eczemas and hypersensitivity.¹ Hayden et al, Sayal et al, Porter et al have also reported similar incidence in their studies,

however studies by Nanda et al, Wenk and Itin et al, Horn et al and Patel et al showed that eczematous dermatoses was the predominant variety.^{4,9,10,12,15-17}

Of the infective dermatoses, bacterial infections (14.5%) were the most common, followed by parasitic (10.9%), fungal (8.1%) and viral infections (7.6%). Similar pattern has been observed by Sardana et al, Karthikeyan et al and Sharma et al.^{1,13,18} Hayden et al reported 17.4% incidence and Negi et al reported 15.6% incidence of bacterial infections in their studies.^{4,19} Sayal et al reported fungal infections to be more common while Wenk and Itin and Gul et al observed viral infections to be the most common.^{9,12,14} This variation among infective dermatoses depends upon the region of study, environmental factors, type of population studied, hygiene, nutritional status hygiene etc. It was found that among the rural versus urban population, infective dermatoses predominated in rural population 58.54% cases belonged to rural population and 41.46% cases belonged to urban population.

In the present study, Impetigo was the commonest (57.93%) entity among bacterial infections, followed by secondary pyoderma (24.83%). According to Dagan, impetigo is the most common childhood skin infection.²⁰ The outcome of our study is also the same. However, in another study by Karthikeyan et al, secondary pyoderma was common, followed by impetigo.¹³ Of the total cases of bacterial infections, 57.93% belonged to rural population and 42.07% belonged to urban population. This is in accordance with the trend that infective dermatoses predominated in rural population.

Of the parasitic infections, majority i.e. 63.30% belonged to rural population. Scabies was the predominant type seen in 10.3% cases. Almost similar occurrence (10.61%) has been reported by Sardana et al and Mitra et al (16.07%).^{1,21} However lower prevalence of scabies was seen in studies from the West.^{10,12,22} Majority of the cases (90 out of 103) had poor hygiene. Overcrowding was seen in 67 cases and family history was positive in 90.3% cases of scabies. Various studies have reported that incidence of pediculosis capitis is quite high in school going children, whereas in our study incidence was quite less i.e. 0.6%.^{23,24} This may be explained by the fact that pediculosis capitis being more common in children of school going age group and also that being a mild illness most of the children do not report to the hospital.

Out of 1000 children, fungal infections were observed in 8.1%. The incidence is similar to various studies.^{4,18,25} *Tinea capitis* was the most common seen in 69.14% cases. *Tinea faciei* was seen in 13.58% cases followed by *Tinea corporis* in 12.35% cases. In other studies also *Tinea capitis* was more common as compared to other types.^{1,8} However, in a study by Sharma and Mendiratta, candidal intertrigo was the most common infection (39.47%) followed by *Tinea capitis* (34.3%) and *Tinea corporis* (19.15%).¹⁸

Viral infections were found in 7.6% children in our study. Hayden and Anand and Gupta reported similar incidence in their studies.^{4,25} *Molluscum contagiosum* was the predominant type of viral infection seen in our study (5.3%) followed by warts 2.2%. Similar pattern has been observed in some other studies as well.^{1,9,13} In a study by Wenk and Itin, almost equal patients of verrucae and molluscum were seen.¹²

The second most common category group in the present study was eczematous disorders constituting 35.1% cases. Of the eczema group, atopic dermatitis was the commonest (19.3%) entity in our study, followed by seborrhoeic dermatitis (6.2%) and pityriasis alba (2.6%). Diaper dermatitis was seen in 1.7% cases. Nanda et al reported atopic dermatitis (31.3%) as the most common eczematous disorder, followed by pityriasis alba (5.25%) and diaper dermatitis (4.04%).¹⁰ Wenk and Itin recorded atopic dermatitis (25.9%) as the most common pediatric skin disorder, followed by non-atopic eczema (3.9%) and pityriasis alba (2.5%).¹² However, Sardana et al found infantile seborrhoeic dermatitis (10.49%) more common compared to pityriasis alba (5.85%) and atopic dermatitis (5.27%) and Hayden documented diaper dermatitis (16%) to be more common, followed by atopic dermatitis (9%) and seborrhoeic dermatitis (6%).^{1,4}

Atopic dermatitis contributed 19.3% of the total cases in the present study. It was seen that cases from the urban population (53.9%) outnumbered those from rural population (46.1%) in atopic dermatitis. The disparity between lower incidence of atopic dermatitis from developing countries like India and higher incidence from developed countries can be explained by difference in industrialization, the "hygiene-hypothesis", climate and dietary habits.^{1,13,19}

Allergic/hypersensitivity dermatoses were seen in 5.9% cases in the present study with equal number seen in urban and rural population. There were 3.3% cases suffering from papular urticaria which was the commonest among allergic dermatoses followed by urticaria, drug reactions and paderus dermatitis. Papular urticaria was more common in the urban population. This is in concordance with study by Sardana et al, which also showed a high frequency of cases of papular urticaria (3.59%) and is because of hot climatic conditions combined with scant clothing that exposes children to insect bites in urban households.¹ Sayal et al also noticed more frequent occurrence of papular urticaria as compared to urticaria.⁹ In some studies urticaria has been reported to be more common than papular urticaria.^{10,13} Congenital malformations were common (4.8%). Their high prevalence in the present study may be explained by the fact that such cases are commonly referred to tertiary care institutions. Similar observation has been seen in other studies conducted in referral hospitals.^{1,13,15,19} The most common among congenital malformations in our study were capillary hemangioma (2.7% cases), followed by 1.2% cases of congenital

melanocytic nevi and 0.8% cases of nevus depigmentos. Hemangiomas occur in approximately 2.5% of all neonates.¹ Sardana et al noted that hemangiomas of infancy were the most common condition among congenital malformations seen in 1.04% cases followed by nevus depigmentos and congenital melanocytic nevus.¹

Various studies have shown that the prevalence of vitiligo in pediatric population varies from 1.51% to 4.4%.^{8,11,18,26} In the present study, the prevalence of vitiligo 3.2%. It was observed that vitiligo was more in girls (27 out of 32 cases) than boys (5 out of 35 cases) and this resembled with the study of Valia et al who also reported it to be more in girls than boys.²⁷ Halo nevus was seen in 3 cases.

Among papulosquamous disorders (1.9%), the prevalence of psoriasis was 0.5% as similarly observed by Sharma et al (0.56%) whereas Findlay et al and Nanda et al in Kuwait found a higher incidence of 2.0% and 4.0% respectively.^{18,22,10} Lichen planus was found in 0.9% children in our study which is a relatively higher incidence as compared to studies by Sardana et al, Findlay et al and Kumar et al, who have reported the incidence of lichen planus as 0.36%, 0.2% and 0.05% in children respectively.^{1,22,23}

1.2% children in this study had nutritional deficiency dermatoses consisting of xerosis and phrynodema (0.7%) and acrodermatitis enteropathica (0.5%). There is a declining prevalence of vitamin A deficiency over the years which may be due to the use of prophylactic doses of vitamin A administered as a part of expanded programme of immunization.

In the present study, the incidence of ichthyosis vulgaris was found to be 1.2% which was similar to study by Findlay et al, who also reported an incidence of 1.0%.²² Among the vesiculobullous disorders, there was a rare case of epidermolysis bullosa simplex-mottled pigmentation in a 6 months old male child, who had bullous lesions on the trunk and extremities. In addition, the child had mottled pigmentation nearly on the entire body since birth with the mother and sister of the child having similar mottled pigmentation and history of bullous eruptions. It is a rare, distinctive subtype of epidermolysis bullosa simplex, inherited as autosomal dominant disorder characterized by bullous lesions along with the presence of discrete pigmented macules 2-5 mm in diameter, which usually appear in infancy and persist throughout life.²⁸

CONCLUSION

To conclude, there is preponderance of infectious dermatoses among the under five population followed by eczematous and hypersensitivity disorders. The role of poverty, overcrowding, poor personal hygiene and low level of health education, under nutrition and consequent poor immunity are emphasized by these preventable

diseases. This study analyzed the disease patterns and prevalence in this area of Punjab, that will help in taking proper measures to prevent and treat various pediatric dermatoses. It will also be help to assess the changing trend and exploration of various subgroups e.g. community acquired infections, infestations, eczema, disorders of keratinization etc in pediatric age group. The child with tuberous sclerosis was known epileptic. She showed characteristic findings of adenoma sebaceum on face, ash leaf macules and shagreen patch on chest and upper back. The patient with familial hypercholesterolemia with deranged lipid profile showed dermatological findings of multiple xanthomas on bilateral buttocks, knees, elbows and tendoachilles.

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