Introduction

Globally, skin diseases cause a significant impact on the quality of life of an individual. According to the Global burden of the disease project, worldwide dermatoses are among the leading causes of disease burden. In India, especially in the areas where the resources are poor, skin disorders are very common. They account for approximately 6-12% of all the medical diseases. Among skin disorders, pediatric disorders constitute about 8-40%. Out of these, only 40% of the cases are seen by a dermatologist because most of the patients visit General practitioners. Among skin disorders, pediatric disorders constitute about 8-40%. Out of these, only 40% of the cases are seen by a dermatologist because most of the patients visit General practitioners. This variation strongly suggests that weather has a very important role. Thus various measures including health education programs to be initiated to control and prevent the sudden spread of the diseases. Thus, Primary care providers and family physicians being the first responders should always keep in mind the seasonal variations while dealing with dermatosis in children.

Keywords: Clinical patterns, eczemas, fungal infections, seasonal variation

Introduction

Pediatric skin disorders are different from the adult type in their presentations, types, treatment and prognosis. Their presentation varies from place to place. Aim: To study the different clinical pattern and seasonal variation of dermatoses in children attending a multispecialty hospital in Uttar Pradesh. Materials and Methods: This study was conducted among 640 children who attended the OPD of multispecialty hospital over a period of one year. All children up to 10 years of age with cutaneous presentations were included in the study. Results: Study showed that there was a male preponderance among the study participants. According to the age group, school-aged children (6-10 years) constituted the highest percentage (53%) followed by toddlers or pre-school children (41%). The most common skin conditions were infections (47%) followed by eczematous group (31%) of disorders. Among the infections, the most common infections were fungal - 35.64% (107) followed by parasitic infection (31%), viral infections (20%) and then bacterial infections (12.5%). Out of total eczematosus dermatoses, Atopic dermatitis was maximum in number (61; 30%). This was followed by pityriasis Alba (47; 23.15%), and acute eczemas (32; 15.76%). Among the infections, the most common infections were fungal - 35.64% (107) followed by parasitic infection (31%), viral infections (20%) and then bacterial infections (12.5%). Out of total eczematosus dermatoses, Atopic dermatitis was maximum in number (61; 30%). This was followed by pityriasis Alba (47; 23.15%), and acute eczemas (32; 15.76%). Third most common dermatosis was Appendageal disorder (33; 5.15%). It included 15 cases of miliaria i.e. approximately 45.45%. Seventeen (2.65%) children reported for treatment of different kind of nevi. Pigmentary disorders were seen in 16 cases (2.5%). Three nutritional disorders were also seen. Season wise, most of the cases were seen in monsoons (June to October). Conclusions: Dermatoses is very common in children in the western region of Uttar Pradesh. The largest group was formed by infections followed by eczemas. Few cases increased in number depending upon the weather like fungal and bacterial infections, acne, miliaria in summers and xerosis, scabies in winters. This variation strongly suggests that weather has a very important role. Thus various measures including health education programs to be initiated to control and prevent the sudden spread of the diseases. Thus, Primary care providers and family physicians being the first responders should always keep in mind the seasonal variations while dealing with dermatosis in children.

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physician or pediatrician for their primary and secondary skin problems.

In India, the pattern of the skin disease depends on multiple factors like geographical area, extreme weather conditions, malnutrition, poverty, overcrowding, lack of education, social beliefs and pre-existing medical illness. Most commonly, the presentation reflects their hygiene and nutritional status. Primary care providers and family physicians should be aware of multi-factorial causes of pediatric dermatosis and should identify them, as they are the first responders. This study was thus carried out to find out the various pattern of skin disease in western areas of Uttar Pradesh and the changing pattern according to the seasons. The study is important because it may play a significant role in improving community health and also help in making various health policies.

Methodology

This is a study done in the department of dermatology at multispeciality Hospital, in the western region of Uttar Pradesh. This region is warm and temperate. The average temperature is approximately 25 degree Celsius. Its highest average temperature in summers is 33 degree Celsius. Study period was for a period of one year and included all children up to 10 years of age. Data was collected by means of pretested questionnaire along with detailed history and examination of the patients. All the new and old cases attending the dermatology OPD directly and those referred from general and pediatric OPD during the course of one year were included in the sample size. A total of 640 attended the OPD and thus were included in the study. Informed consent from the patients was recorded on a proforma. Analysis was done using Epi Info version 7.

Results

Over a period of one year, total number of patients who attended the dermatology OPD was 26,697. Out of the total patients, total pediatric patients of age group up to 10 years of age were 640 i.e. 2.4%. Out of 640, male were 415 (64.84%) and total female were 225 (35.15%). So, total boys to girls’ ratio were 1.8:1 [Figure 1].

The general pattern of the disease

On following the disease pattern, the highest proportion of disease was constituted by infections (47%) followed by eczematous disease (31%) [Table 1].

The pattern of the dermatoses according to the age group

According to the age group, school-aged children (6-10 years) constituted the highest percentage (33%) followed by toddlers or pre-school children (41%) [Table 2 and Figure 2].

Pattern of infections

Among the infections, the most common infections were fungal. They constituted about 35.64% (107) of the total infections. This was followed by parasitic infection (31%), viral infections (20%) and then bacterial infections (12.5%). Out of total fungal infections (108), Tinea was the most common entity (72; 66.6%). This was followed by candida infections. Out of the parasitic infections (95), the most common was Scabies (91; 95%). warts (17; 27.4%) were the most common viral infections (62), followed by Molluscum contagiosum (12; 19.35%) [Table 3 and Figure 3].

The pattern of eczematous disorder

Eczematous disorder constituted the second-highest entity (203, 31.71%) after infections. Out of total eczematous dermatoses,

Table 1: The pattern of different dermatoses among study participants

| Type of disease        | Number of children affected | Percentage |
|------------------------|-----------------------------|------------|
| Infections             | 303                         | 47.34%     |
| Eczematous disorder    | 203                         | 31.71%     |
| Appendageal disorders  | 33                          | 5.15%      |
| Papulosquamous disorders| 21                          | 3.28%      |
| Vascular disorder      | 20                          | 3.1%       |
| Naevoid disorder       | 17                          | 2.6%       |
| Pigmentary disorder    | 16                          | 2.5%       |
| Metabolic disorders    | 3                           | 0.46%      |
| Drug reactions         | 1                           | 0.15%      |
| Miscellaneous          | 23                          | 3.5%       |

Table 2: The distribution of different dermatoses according to age groups

| Dermatosis                          | <1 years | 1-5 years | 6-10 years | Total |
|-------------------------------------|----------|-----------|------------|-------|
| Infections                          | 15       | 120       | 168        | 343   |
| Eczematous disorder                 | 11       | 100       | 92         | 203   |
| Appendageal disorders               | 3        | 11        | 19         | 23    |
| Papulosquamous disorders            | 1        | 6         | 14         | 11    |
| Vascular disorder                   | 0        | 2         | 18         | 22    |
| Naevoid disorder                    | 1        | 7         | 9          | 9     |
| Pigmentary disorder                 | 0        | 6         | 10         | 6     |
| Metabolic disorders/nutritional disorders | 0  | 3        | 0          | 3     |
| Drug reactions                      | 0        | 1         | 0          | 1     |
| Miscellaneous                        | 3        | 9         | 11         | 13    |
| Total                               | 34       | 263       | 342        | 640   |

Figure 1: Sex wise distribution of paediatric dermatoses
Atopic dermatosis was maximum in number (61; 30%). This was followed by pityriasis Alba (47; 23.15%), and acute eczemas (32; 15.76%). The different pattern and frequency of eczema are shown in Table 4.

Third most common dermatosis was Appendageal disorder (33; 5.15%). It included 15 cases of miliaria i.e. approximately 45.45%. This was followed by acne (Grade 1 and Grade 2) (8; 24.24%) in school-aged children (9-10 years). Rest all is constituted by hyperhidrosis (5; 14.6%) and alopecia areata (5; 14.6%). The papulosquamous condition was seen in 21 patients i.e. approximately 3.28% of total children. Among this, lichen nitidus (10; 47.61%) was found to be the most common condition, followed by psoriasis Vulgaris (8; 38%) and lichen planus (3, 14.28%). 70% of Lichen nitidus and 100% of psoriasis was seen in the age group 6-10 years. 3.12% (20) of the patients were diagnosed to have a vascular disorder which constituted both of acute (17; 85%) and chronic (3; 15%) urticaria.

Seventeen (2.65%) children reported for treatment of different kind of nevi. These included congenital melanocytic nevus (4; 23.52%), capillary hemangioma (4; 23.52%), nevus depigmentosus (3; 17.64%), verrucous epidermal nevus (2; 11.76%), Mongolian spot (1; 5.88%) and congenital alopecia (1; 5.88%). Pigmentary disorders were seen in 16 cases (2.5%). All cases were vitiligo. Out of which, twelve cases were seen in school-aged children and 04 cases were in pre-school children. Three nutritional disorders were seen. A two-year-old child presented with Acrodermatitis Enteropathica and rest two came to OPD with phrynoderma. One child presented in the emergency department with an adverse reaction to drug i.e. Toxic Epidermal Necrolysis. Twenty three (3.59%) patients were categorized as miscellaneous. It constituted of generalized xerosis and ichthyosis (16; 69.56%), palmoplantar peeling (5; 21.73%), generalized pruritus (3; 13.04%), hypertrophic scar (2; 8.69%) and one case of Erythema toxicum neonatorum. Season wise, most of the cases were seen in monsoons (June to October) [Figure 4].

**Discussion**

This retrospective study was done to have a basic idea of the pattern of pediatric dermatoses in the western region of Uttar Pradesh. The total dependent population in this center is approximately 30,000.

It requires specific skill to deal with the pediatric skin disorders due to variation in their clinical presentation and their management. Further, there are multiple factors which influence their presentation and prognosis. Access of individual to health care is another most important factor which influences the presentation of dermatoses.

In our study, the majority of the patients belonged to the age group of 6-10 years i.e. the school-going children. They constituted about 53% of the total children (640). The reason behind this may be the environmental exposure that they get in comparison to the infants and toddlers. Another reason may be that the parents of below 5 years children visit the pediatrician for all entities. This was supported by multiple other studies done by Sharma et al., Sacchidanand et al., Karthikeyan et al.[9-11] In our study, we saw only two newborn babies. One baby had the transient neonatal condition which was Erythema Toxicum Neonatorum and another was brought by the parents with neonatal candidiasis.
Viral infections constituted about 20% of the total infections. In this, maximum school-going children presented with viral warts (27%) followed by molluscum contagiosum (19%) and chickenpox (17%). Rest were the cases of pityriasis Rosea (8; 12.90%), Hand, foot and mouth disease (7; 11.29%) and viral exanthem (6; 9.6%). Viral infections were prevalent during January to April.

The incidence of bacterial infections was 12.54% and it constituted about 6% of all dermatosis. Most commonly encountered was Impetigo approximately 76% of total bacterial infections. This was followed by pyoderma (15.78%), unlike Ghosh et al[22] and Bhatia[23] where it was the predominant bacterial infection.

After infections, second most common dermatoses were Eczema which constituted about 32% of total pediatric dermatoses. It was similar to the study done by Neupane S et al[8] Reddy et al[24] Atopic dermatitis was the most common presentation (30%) followed by pityriasis alba (23%). In our study, except for one case, all had a mild presentation. The reason behind this may be that our population was predominantly breastfed and none of them had a family history of atopy. History of seasonal exacerbation (November to February) was present in 50% of the population. Other endogenous eczema included seborrheic dermatitis (SD). The incidence of SD was 14.77%. This was followed by papular urticaria (10.34%) and lichen striatus (2.95%). Among exogenous eczemas, most common was acute eczemas (15.76%). In a study done by Shrestha et al[25] eczemas were the most common pediatric dermatoses, unlike our study. The difference in the incidence of various eczemas specifically atopy suggests that it may be due to different environmental allergens, genetic factors and climate changes.

In our study, the third most common disorders were appendageal skin disease. The prevalence of appendageal disease was 5.15%. Miliaria was the most common (2.3%) presentation. The most common affected population was toddlers. This was followed by acne (1.25%) in the age group 9-10 years. The prevalence of Alopecia areata and hyperhidrosis was the same in our study i.e. 0.78%. All the patients of this group reported in summers.

Papulosquamous disease constituted about 3.28% of the total dermatosis which was less in comparison to the study done by Sacchidanand et al[10] and more in comparison to the study other studies like Sacchidanand et al, Sardana et al, Balai M et al[21] where the incidence of scabies was 6.94%, 10.61% and 10.42% respectively. On taking the detailed history, sharing of clothes, towel and overcrowding in sleeping areas were found to be the most common culprit behind this. It was seen more in months of October to February and Muslim population (33% of the total population of Meerut as per census 2011) suggesting the role of temperature, environment condition and socio-cultural factors.

Like other literature, there was a male preponderance in the study[12-14] The boy to girl ratio came out to be approximately 2:1. But there are few studies by Joel et al., Ferreira et al., Kuruvilla et al., Yuwnate et al., which showed female preponderance.[15-18]

Out of the different dermatoses, infections were the most commonly encountered pediatric skin condition. Out of total infections (303), 66.66% patient had fungal infections. The most common presentation was Tinea corporis followed by candidal infections. The reason behind this may be the hot and humid temperature of Meerut. The finding is similar to many studies conducted all over India except few where the bacterial infection was the most common infections.[13,17-19]

After fungal infections, parasitic infestations were the most commonly encountered condition. Scabies constituted about 30% of total infections which was much more in comparison to Table 3: Pattern of various infections among study participants

| Type of infection | Total number of patients | Percentage |
|-------------------|--------------------------|------------|
| Fungal infections |                          |            |
| Tinea infections  | 72                       | 66.66%     |
| Candida infections| 17                       | 15.74%     |
| Pityriasis Versicolor | 17                   | 14.81%     |
| Onychomycosis     | 2                        | 1.85%      |
| Bacterial infections |                       |            |
| Impetigo          | 29                       | 76.31%     |
| folliculitis      | 5                        | 13.15%     |
| lerosis           | 2                        | 5.26%      |
| Bacterial abscess | 1                        | 2.63%      |
| SSSS              | 1                        | 2.63%      |
| Viral infections  |                          |            |
| Viral warts       | 17                       | 27.41%     |
| Molluscum contagiosum | 12                   | 19.35%     |
| Chickenpox        | 11                       | 17.74%     |
| Pityriasis rosea  | 8                        | 12.90%     |
| Hand foot and mouth disease | 7                | 11.29%     |
| Viral exanthem    | 6                        | 9.6%       |
| Herpes simplex    | 1                        | 1.61%      |
| Parasitic infections |                    |            |
| Scabies           | 91                       | 95.78%     |
| Paediatric dermatitis | 2                    | 2.10%      |
| Pediculosis capitis | 2                     | 2.10%      |

Table 4: Pattern of eczematous dermatosis

| Type of eczema | Total number of patients | Percentage |
|---------------|--------------------------|------------|
| Atopic dermatitis | 61                    | 30%        |
| Pityriasis alba | 47                      | 23.15%     |
| Acute eczemas  | 32                       | 15.76%     |
| Seborrhoeic dermatosis | 31                   | 15.20%     |
| Papular urticaria | 21                    | 10.34%     |
| Lichen striatus | 6                       | 2.95%      |
| Allergic contact dermatitis | 4                   | 1.97%      |
| Irritant contact dermatitis | 1                  | 0.49%      |
done by Reddy et al. There were a total eight cases of psoriasis and three cases of lichen planus. All cases were seen in the age group 6-10 years except two cases of lichen planus which were seen in below 5 years children. The frequencies of visits of these cases were from September to December. It is probably due to flaring up of the lesions in cold weather.

About 3.12% (20 cases) of the total cases were urticaria. Out of these, 17 cases reported with acute urticaria and 03 patients had a history of chronic intermittent lesions.

The Nevoid disorder was 2.6% of the total cases. This was higher in comparison to studies done by Hassan et al., Thappa et al. and Reddy et al. where the prevalence was varying from 0.5 to 1.5%. In this group, congenital melanocytic nevi was the most common presentation.

The pigmentary disorder was 2.55% of all the dermatoses. This was almost similar to study by Thappa et al. and very less in comparison to Ben Saif GA (8.9%) and Patel et al. studies (11.48%). Focal vitiligo was the most common presentation followed by acrofacial vitiligo.

Among nutritional disorder, only one case of Acrodermatitis enteropathica was seen. One case of drug reaction, Toxic epidermal necrolysis was seen in a 4-year-old child in February.

Surprisingly, no vesiculobullous disorder was seen. Miscellaneous conditions constituted 3.6% of the study population. Most of the population in this group was of generalized pruritus and xerosis. There was one case of congenital ichthyosis and two cases of hypertrophic scar. Five school going children reported with seasonal palmoplantar peeling. Thus, Primary care providers and family physicians being the first responders should always keep in mind the various types of Pediatric dermatosis and their seasonal variations while dealing with dermatosis in children.

**Conclusions**

We conclude that dermatoses are very common in children in the western region of Uttar Pradesh. The largest group was formed by infections followed by eczemas. There was wide variation in dermatosis according to age, gender, seasons and their habits. Most commonly affected ones were school-going children. Few cases increased in number depending upon the weather like fungal and bacterial infections, acne, malaria in summers and xerosis, scabies in winters. This variation strongly suggests that weather has a very important role. Further, multicentric studies covering larger areas can be used by the health policy-making personals to make important health education programs related to pediatric age. Also various measures can be taken to control and prevent the sudden spread of the diseases.

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**Authors contribution**

All authors have contributed to preparation of manuscript.

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**Conflicts of interest**

There are no conflicts of interest.

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