ABSTRACT

Background: Skin diseases are common health problem in children all over the world. However, there is scarcity of epidemiological studies on pediatric dermatoses in Nepal. This study was done to identify the pattern and age variations of pediatric dermatoses in a tertiary care centre in central Nepal.

Methods: All children 18 years and below with skin disease attending dermatology OPD between the period of June 15, 2019 to December 15, 2019 were included in the study. SPSS 20 was used for statistical analysis with which descriptive statistics was done.

Results: A total of 2789 patients (60.1% male and 39.9% female) with 2895 diagnoses were recorded during this period. The most common dermatoses were infections and infestations (62.8%) followed by eczema (12.1%), acne (7.5%) and urticaria (4.8%). Pigmentary disorder constituted 2.6%. Insect bite reaction was seen in 2.6%, miliaria 2%, papulosquamous disorders 1.5% followed by disorders of hairs and nails 0.9%.

Conclusions: This study revealed the most prevalent skin diseases in children in specialized dermatology clinic in a developing country such as Nepal. Fungal infection was commonest disease in adolescent and school age children whereas bacterial infection was commonest in infants, toddler and preschool children. Acne was predominantly seen in adolescent.

INTRODUCTION

Skin diseases are important component of any primary care practice that includes children. Skin diseases are common world wide but their distribution of types and frequencies may vary according to geographical areas. Studies have reported that infections and infestations are common in developing countries whereas eczema and skin cancers are more common in developed countries owing to their particular skin type. Prevalence of skin diseases in children depends on socioeconomic status, climate, hygiene. There are more than 3000 known diseases of the skin.¹ It can be transitory to chronic and recurrent. Transitory skin diseases like infections are easily treated and preventable with simple hygiene measures. Chronic and incurable skin diseases like eczema, psoriasis and vitiligo are the important cause of morbidity and impairs quality of life in children.

Prevalence of skin disease in general population vary from 6.56% to 11.16% in various studies.² ³ Skin diseases constitute 20% to 30% of all outpatient visit to a pediatrician and 30% of all visits to dermatologists are patients of pediatric age group.⁴ Despite this relatively little attention is given in national health policies and little is known about the impact of pediatric skin disease on health care systems in developing countries like Nepal. This study was aimed to determine pattern and age variation of skin diseases in representative pediatric population in a tertiary care centre.

METHODS

This was a retrospective study conducted from June 15, 2019 to December 15, 2019 in the Department of Dermatology, Chitwan Medical College, Chitwan, Nepal. Data was taken from medical records. Two thousand seven hundred and eighty-nine children were enrolled in the study. Ethical clearance for the study was obtained (CMC-IRC/077/078-083). SPSS 20 was used for statistical analysis with which descriptive statistics was done.

RESULTS

In this study 2789 patients of age 18 and below were included. A total of 2895 diagnoses were made in 2789 children. Of them, 1112(39.9%) were female and 1677(60.1%) were male.
Most children were adolescent (55.36%) (Table 1).

Table 1: Demographic profile of study patients

| Age                | Boys (%) | Girls (%) | Total (%) |
|--------------------|----------|-----------|-----------|
| Neonates (Birth to 28 days) | 5(0.17)  | 5(0.17)   | 10(0.35)  |
| Infants (1 mon to 1 yr)       | 71(2.54) | 89(3.19)  | 160(5.73) |
| Toddler (1yrs to 3yrs)        | 96(3.44) | 153(5.48) | 249(8.92) |
| Preschool (3yrs to 5yrs)      | 63(2.25) | 108(3.87) | 171(6.13) |
| School age (5yrs to 11yrs)    | 244(8.74) | 411(14.73) | 655(23.48) |
| Adolescents (11yrs to 18yrs)  | 633(22.69) | 911(32.66) | 1544(55.36) |

Table 2: Distribution of etiology of various dermatoses in children

| Disease                                     | Female | Male | Number (%) |
|---------------------------------------------|--------|------|------------|
| Infections and infestations                 | 634    | 1184 | 1818(62.8) |
| Eczema                                      | 163    | 189  | 352(12.1)  |
| Acne                                        | 119    | 98   | 217(7.5)   |
| Urticaria                                   | 66     | 74   | 140(4.8)   |
| Pigmentary disorders                        | 42     | 34   | 76(2.6)    |
| Papular urticaria                           | 30     | 45   | 75(2.6)    |
| Miliaria                                    | 26     | 33   | 59(2.0)    |
| Papulosquamous disorders                    | 19     | 24   | 439(1.5)   |
| Disorders of Hairs and nail                 | 10     | 15   | 25(0.9)    |
| Hemangioma                                  | 3      | 3    | 6(0.2)     |
| Connective tissue disease                   | 4      | 1    | 5(0.2)     |
| Genetic disorders                           | 0      | 2    | 2(0.1)     |
| Others                                      | 44     | 33   | 77(2.6)    |
| Total                                       | 1160   | 1735 | 2895(100)  |

The three most common dermatoses were infections and infestations (62.8%), eczema (12.1%) and acne (7.5%) (Table 2).

Table 3: Pattern of infections and infestations

| Disease                | Number (%) |
|------------------------|------------|
| Bacterial infections   |            |
| Impetigo               | 185(6.57)  |
| Furunculosis           | 68(2.41)   |
| Folliculitis           | 60(2.13)   |
| Secondary pyoderma     | 79(2.8)    |
| Acute paronchycia      | 80(2.8)    |
| Abscess                | 50(1.7)    |
| Blistering distal dactylitis | 40(1.4) |
| Cellulitis             | 20(0.7)    |
| Leprosy                | 2(0.07)    |
| Fungal infections      |            |
| Dermatophytic infections | 640(22.73) |
| Pityriasis versicolor  | 169(6)     |
| Candidiasis            | 29(1.03)   |
| Parasitic infections   |            |
| Scabies                | 285(10.12) |
| Pediculosis            | 6(0.21)    |
| Viral infections       |            |
| Warts                  | 91(3.23)   |
| Varicella              | 81(2.87)   |
| HFMD                   | 39(1.38)   |
| Molluscum contagiosum  | 31(1.1)    |
| Herpes zoster          | 11(0.39)   |
| Viral exanthem         | 11(0.39)   |
| Herpes labialis        | 10(0.35)   |

Most common infection was fungal infection (30.04%). Dermatophytic infection (22.73%) was commonest among fungal infections. Impetigo (6.57%) was most common among bacterial infections (14.80%) and scabies (10.12) was most common among parasitic infections (10.43%). Leprosy was seen in two patients. Verruca vulgaris (3.23%) was the most common viral infection followed by varicella (2.87%) and Hand foot and mouth disease (HFMD). The pattern of infections and infestations are shown in Table 3.

Eczema was seen in 12.1% of children. Seborrhoeic dermatitis (3.01%) was the most common presentation of eczematous dermatitis followed by irritant contact dermatitis (2.16%). Atopic dermatitis was seen in 25 (0.88%) children. Highest proportion of eczema was seen in infants in which Seborrhoeic dermatitis was the commonest. Pattern of eczema is shown in Table 4 and distribution of common dermatoses according to age group in Table 5.

Table 4: Pattern of eczema

| Eczema                        | Number (%) |
|-------------------------------|------------|
| Seborrhoeic dermatitis        | 85(3.01)   |
| Irritant contact dermatitis   | 61(2.16)   |
| Pompoholx                     | 47(1.66)   |
| Allergic contact dermatitis   | 45(1.59)   |
| Nummular eczema               | 40(1.42)   |
| Atopic dermatitis             | 25(0.88)   |
| Pityriasis alba               | 36(1.27)   |
| Lichen simplex chronicus      | 5(0.17)    |
| Prurigo nodularis             | 30(1)      |
| Juvenile plantar dermatosis   | 30(1)      |
| Asteatotic eczema              | 20(0.7)    |
| Total                         | 352(12.61) |
**Fungal infection** was the commonest dermatosis in children, whereas **bacterial infection** was commonest in infants, **toddler** and preschool children. Acne was predominantly seen in adolescence. The highest proportion of eczema was seen in **school age** children whereas bacterial infection was commonest in **infants**. Acne was predominantly seen in adolescence. The highest proportion of eczema was seen in **school age** children whereas bacterial infection was commonest in **infants**.

**Vitiligo** (1.5%) was the commonest pigmentedary disorder seen. **Pityriasis rosea** was the most common papulosquamous disorder followed by lichen planus and psoriasis. **Alopecia areata** was the most common type of alopecia observed.

**Hemangioma** was the most common benign skin tumor. Systemic lupus erythematosus was the most documented connective tissue disorder. In genodermatoses **ichthyosis vulgaris** and xeroderma pigmentosum was seen in one patient each.

**DISCUSSION**

In our study infectious dermatoses (62.8%) were most common followed by eczema (12.1%). Similar results were seen in a study done in western region of Nepal by Yogesh et al. In a similar study done by Shrestha et al, which was conducted in hilly region of Nepal, eczema was the commonest dermatoses. In various studies done in Asian and African countries, infections and infestations were most common skin diseases whereas eczema was most common in western countries. This indicates infectious dermatoses are more common in hot and humid climate and in countries with poor hygiene and low socioeconomic status. Various studies show that lower outdoor temperature contribute to worsening of eczema which might be the reason it is more common in areas with higher altitudes. In our study superficial fungal infections were seen in 30.04% children. In another study done in western region of Nepal, fungal infection was seen in 18.5% of children. In a study done in Nigeria, fungal infections were the seen in 16.3% children. Superficial fungal infections are important public health problem worldwide. They are found to affect 20% to 25% of worlds population and the incidence continue to increase. Acne affects approximately 85% of adolescents. It was the third most common dermatoses in our study. Acne was the most prevalent dermatoses after fungal infection in adolescents. Acne was significantly more prevalent in girls than in boys. Similar results were reported by Park et al and Dreno. This may be because girls are aesthetically more concerned than boys and seek treatment. Various studies on schoolchildren have shown that females have an earlier onset of acne vulgaris than males which may contribute to higher prevalence of acne in females. The worldwide lifetime incidence of urticaria is estimated to be higher than 20%. The incidence in children is about 2.1–6.7% for all subtypes. In our study current urticaria was seen in 4.8% children. There was no statistically significant difference in prevalence in boys and girls. Similar results were seen in a study done in Korea. However in adults several studies have reported higher prevalence of urticaria in women. It might be due to autoimmune mechanism in chronic urticaria which is more frequent in women.

**Papular urticaria** is a chronic inflammatory disease caused by bites of arthropods like fleas and mosquitoes. It is more prevalent in tropical areas where the insects and arthropods are abundant. In our study papular urticaria was seen in 2.6% children which is similar to that reported by Yogesh et al. In a study done in India by Karthikeyan et al the prevalence of papular urticaria was 5.3%.

Vitiligo affects approximately 1% of global population. In our study vitiligo was seen in 1.5% of children. In another study done in Nepal it was seen in 2% of children. World wide epidemiological data on childhood vitiligo are scarce. The prevalence of childhood vitiligo in India is 0.46–8.88%. In our study pigmentedary disorders were more common in females. Similar results for vitiligo were reported by Handa et al. Due to social stigma in South Asian countries, females tend to notice and seek treatment for pigmentedary disorders earlier than males. Vitiligo also has psychosocial impact in children. A major limitation of this study is that being a hospital-based study, the results of our study may not fully represent the prevalence of pediatric skin diseases in the general population. For this, a larger community-based study is recommended in future.

**CONCLUSION**

Majority of the study population belonged to adolescent age group. Infections and infestations, eczema and acne were three common dermatoses seen in children. Dermatophytic
infection was the most common infection. Cosmetically significant dermatoses acne and pigmentary skin diseases were more common in females. This study identifies the pattern of pediatric dermatoses in central region of Nepal and may help in formulating preventive measures, health education and disease control strategies.

**CONFLICT OF INTEREST:** None

**FINANCIAL DISCLOSURE:** None

**REFERENCES:**

1. Basra MKA, Shahruck M. Burden of skin diseases. Expert Review of Pharmacoeconomics & Outcomes Research. 2009;9:3:271-83. [DOI]
2. Grover S, Ranyal RK, Bedi MK. A cross section of skin diseases in rural Allahabad. Indian journal of dermatology. 2008;53:4:179. [DOI]
3. Devi TB, Zamzachin G. Pattern of skin diseases in Imphal. Indian journal of Dermatology. 2006;51:2:149. [DOI]
4. Rao GS, Kumar SS, Sandhya. Pattern of skin diseases in an Indian village. Indian J Med Sci. 2003;57:3:108-10. [PMID]
5. Thappa DM. Common skin problems. The Indian Journal of Pediatrics. 2002;69:8:701-6. [DOI]
6. Poudyal Y, Ranjit A, Pathak S, Chaudhary N. Pattern of Pediatric Dermatoses in a Tertiary Care Hospital of Western Nepal. Dermatology Res Pract. 2016;2016:6306404. [DOI]
7. Shrestha R, Shrestha D, Dhakal AK, Shakya A, Shah S, Shakya H. Spectrum of pediatric dermatoses in tertiary care center in Nepal. Nepal Med Coll J. 2012;14:2:146-8. [PMID]
8. Patel KB, Desai BR. Pediatric dermatoses encountered in dermatology outpatient department of teaching hospital. International Journal of Contemporary Pediatrics. 2016;3:4:1178-84. [DOI]
9. Karthikeyan K, Thappa DM, Jeevankumar B. Pattern of Pediatric Dermatoses in a Referral Centre in South India. Indian Pediat. 2004;41:4:373-7. [PMID]
10. Ayanoowo O, Puddicombe O, Gold-Olufadi S. Pattern of skin diseases among children attending a dermatology clinic in Lagos, Nigeria. Pan Afr Med J. 2018;29:162. [DOI]
11. World Health Organization. Epidemiology and management of common skin diseases in children in developing countries. World Health Organization, 2005. [LINK]
12. Pozo-Magaña D, Rosa B, Lazo-Lanгер A, Gutiérrez-Castrellon P, Ruiz-Maldonado R. Common dermatoses in children referred to a specialized pediatric dermatology service in Mexico: a comparative study between two decades. ISRN dermatology. 2012;2012. [DOI]
13. Langan S, Silcocks P, Williams H. What causes flares of eczema in children? British Journal of Dermatology. 2009;161:3:640-6. [DOI]
14. Krämer U, Weidinger S, Darsow U, Möhrenschlager M, Ring J, Behrendt H. Seasonality in symptom severity influenced by temperature or grass pollen: results of a panel study in children with eczema. Journal of Investigative dermatology. 2005;124:3:514-23. [DOI]
15. Flohr C. Recent perspectives on the global epidemiology of childhood eczema. Allergologia et immunopathologia. 2011;39:3:174-82. [DOI]
16. Havlickova B, Czaika VA, Friedrich M. Epidemiological trends in skin mycoses worldwide. Mycoses. 2008;51:2-15. [DOI]
17. Ashton R, Weinstein M. Acne Vulgaris in the Pediatric Patient. Pediatric Rev. 2019;40(11):577-89. [DOI]
18. Park SY, Kwon HH, Min S, Yoon JY, Suh DH. Epidemiology and risk factors of childhood acne in Korea: a cross-sectional community based study. Clinical and experimental dermatology. 2015 Dec;40(8):844-50. [DOI]
19. Dreno B, Poli F. Epidemiology of acne. Dermatology. 2003;206(1):7-10. [DOI]
20. Stathakis V, Kilkenny M, Marks R. Descriptive epidemiology of acne vulgaris in the community. Australasian journal of dermatology. 1997;38:3:115-23. [DOI]
21. Wedi B. Urticaria. Harper’s Textbook of Pediatric Dermatology. 2019:751-63. [DOI]
22. Lee SJ, Ha EK, Lee HM, Lim KS, Lee SW, Kim MA, et al. Prevalence and Risk Factors of Urticaria With a Focus on Chronic Urticaria in Children. Allergy, asthma & immunology research. 2017 May;9(3):212-9. [DOI]
23. Ferrer M. Epidemiology, healthcare, resources, use and clinical features of different types of urticaria. Alergológica 2005. J Invest Allergol Clin Immunol. 2009;19(Suppl 2):21-6. [PMID]
24. Nordlund JJ. The epidemiology and genetics of vitiligo. Clinics in dermatology. 1997;15(6):875-8. [DOI]
25. Handa S, Dogra S. Epidemiology of childhood vitiligo: a study of 625 patients from north India. Pediatric dermatology. 2003;20:3:207-10. [DOI]
26. Hill-Beuf A, Porter JD. Children coping with impaired appearance: social and psychologic influences. General hospital psychiatry. 1984;6:4:294-301. [DOI]