

## Pattern of Pediatric Dermatoses in a Referral Center in South India

**Kaliaperumal Karthikeyan, Devinder Mohan Thappa and B. Jeevankumar**

*From the Department of Dermatology and STD, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Pondicherry 605 006, India.*

*Correspondence to: Dr. Devinder Mohan Thappa, Professor and Head, Department of Dermatology and STD, JIPMER, Pondicherry 605 006, India. E-mail: dmthappa@satyam.net.in*

*Manuscript received: May 14, 2003, Initial review completed: July 3, 2003;*

*Revision accepted: September 1, 2003.*

*This study was undertaken to determine the pattern of dermatoses in children in south India. All children <14 years presenting to us between May 2001 and June 2002 were recruited. A total of 2100 children (males -995; females- 1105) with 2144 dermatoses were recorded. Infections and infestations were the most common dermatoses (54.5%) followed by dermatitis and eczema (8.6%), pigmentary disorders (5.7%), insect bite reaction (5.27%), hair and nail disorders (5.2%), miliaria (4.1%), nutritional deficiency disorders (2.8%), urticaria (2.5%), genetic disorders (2.1%), psoriasis (1.4%), collagen vascular disorders (0.5%), hemangiomas (0.5%), drug eruptions (0.3%), pityriasis rosea (0.2%) and others (5.8%). Pyodermas were the most common dermatoses (47.13%) followed by scabies (30.6%) amongst infections and infestations. Atopic dermatitis was noticed only in 3 patients. Insect bite reactions (papular urticaria) (5.27%) and miliaria (4.1%) were attributed to the tropical weather conditions in this coastal area. Genetic disorders including ichthyosis and palmoplantar keratoderma contributed to 2.1% of cases and could be due to the high incidence of consanguinous marriages in this society.*

**Key words:** Children, Dermatoses, South India.

Dermatological problems constitute at least 30% of all outpatient visits to a pediatrician and 30% of all visits to a dermatologist involve children(1,2). The prevalence of skin diseases amongst children in various parts of India has ranged from 8.7% to 35% in school-based surveys(3). Schools from rural areas showed relatively higher prevalence of skin diseases. All the children in a school survey of high altitude tribal area of Himachal Pradesh, in India were found to have one or more types of skin disease(4). We undertook this study to determine the pattern of common dermatoses in children presenting to a tertiary care center in South India.

### Subjects and Methods

This study was conducted in Dermatology and STD Department of our Institute, a referral center in coastal south India. The

climate of this region is typical of a tropical area with high temperature and humidity.

All children, 14 years and below, attending the dermatology out-patient department with any dermatoses between the period of May 2001 and June 2002 were enrolled in the study. The diagnosis was made by a dermatologist based on detailed history, clinical features and appropriate investigations such as KOH examination, Tzanck test, Gram's stained smear, hematological and biochemical investigations, skiagrams, VDRL test, skin biopsy *etc.* The diseases were tabulated based on the etiology and results were analyzed.

### Results

During the study period of 1 year, 10,400 new cases attended our Out-patient Department. A total of 2,100 children with

BRIEF REPORTS

2,144 dermatoses were seen during this period, thus comprising 20.2% of total new cases. Among these children, 44 had more than one dermatosis. There were 995 male and 1105 female children in the study with male to female ratio of 0.9 : 1. The age and sex distribution is given in *Table I*.

The various dermatoses encountered are shown in *Table II*. The infestations and infections were the most common group of disorders (54.4% -1169 cases). The pattern of various infections and infestations is provided in *Table III*. Pyoderma and scabies were the most common bacterial and parasitic infections, respectively.

The other disorders included in the 'Other' category were lichen nitidus (12), lichen striatus (12), keratosis pilaris (12), folliculitis decalvans (7), lichen planus pigmentosus (7), epidermal nevus (4), granuloma annulare (3), pityriasis rubra pilaris (3), acquired melanocytic nevus (3), erythema toxicum neonatorum (3), histiocytosis(3), anhidrotic ectodermal dysplasia (3), polymorphous light eruption (3), lichen planus (2), nevus depigmentosus (2), cutaneous mastocytosis (2), congenital melanocytic nevus (2), dermatitis herpetiformis (2), callosities (2), xeroderma pigmentosum (2), lipoid proteinosis (2), Bloom's syndrome (2), fissure feet (2), Wiskott-Aldrich syndrome (2), hypomelanosis of Ito (2), lichen sclerosus et atrophicus (2), pyogenic granuloma (1),

**TABLE I**—Age and Sex Distribution of Children.

| Age       | Male        | Female      | Total      |
|-----------|-------------|-------------|------------|
| 0- 1 yr   | 211(10.04%) | 223(10.6%)  | 434(20.6%) |
| 1- 4 yrs  | 412(19.6%)  | 400(19.0%)  | 812(38.6%) |
| 5- 9 yrs  | 272(12.9%)  | 332(15.8%)  | 604(28.7%) |
| 10-14 yrs | 100(4.7%)   | 150(7.1%)   | 250(11.9%) |
| Total     | 995(47.4%)  | 1105(52.6%) | 2100       |

**TABLE II**—Distribution of Etiology of Various Dermatoses in Children.

| Dermatoses                       | No. of cases (%) |
|----------------------------------|------------------|
| Infections and infestations      | 1169 (54.5%)     |
| Dermatitis and eczema            | 184 (8.6%)       |
| Pigmentary disorders             | 123 (5.7%)       |
| Insect bite reaction             | 113 (5.27%)      |
| Disorders of hair and nails      | 112 (5.2%)       |
| Miliaria                         | 88 (4.1%)        |
| Nutritional deficiency disorders | 61 (2.8%)        |
| Urticaria                        | 54 (2.5%)        |
| Genetic disorders                | 46 (2.1%)        |
| Psoriasis                        | 31 (1.4%)        |
| Collagen vascular disorders      | 12 (0.5%)        |
| Hemangiomas                      | 11 (0.5%)        |
| Drug eruptions                   | 7 (0.3%)         |
| Pityriasis rosea                 | 5 (0.2%)         |
| Others                           | 125 (5.8%)       |
| Total                            | 2144 (100%)      |

aphthous ulcers (1), lymphangitis (1), periocular melanosis (1), phenylketonuria (1), tuberous sclerosis (1), erythrokeratoderma (1), implantation dermoid (1), palmoplantar hyperhidrosis (1), geographic tongue (1), Darier's disease (1), congenital syphilis (1), Sturge-Weber syndrome (1), actinic prurigo (1), nevus of Ota (1), Mongolian spot (1), erythema multiforme (1), lipodystrophy (1), neonatal acne (1), incontinentia pigmenti (1), cutis marmorata (1), neurofibromatosis (1), and nevus sebaceous (1).

**Discussion**

The pattern of skin diseases in children is very much influenced by climate, external environment, dietary habits and socio economic status(5). The present study brings into focus the pattern of pediatric dermatoses encountered in a referral center in south India.

The most common dermatoses

**TABLE III**—*Pattern of Infections and Infestations.*

| Dermatoses                       | No. of cases (n) |
|----------------------------------|------------------|
| <i>Pyoderma</i>                  | 551              |
| Secondary pyoderma               | 384 (17.9%)      |
| Impetigo contagiosa              | 124 (5.8%)       |
| Bullous impetigo                 | 40(1.9%)         |
| Blistering dactylitis            | 3(0.14%)         |
| <i>Infestations</i>              | 358              |
| Scabies                          | 304 (14.2%)      |
| Pediculosis                      | 52 (2.4%)        |
| Cutaneous larva migrans          | 2 (0.09%)        |
| <i>Fungal infections</i>         | 181              |
| Tinea corporis                   | 66 (3.1%)        |
| Tinea versicolor                 | 68 (3.2%)        |
| Candidiasis                      | 45 (2.1%)        |
| Subcutaneous phycomycosis        | 2 (0.09%)        |
| <i>Viral infections</i>          | 96               |
| Molluscum contagiosum            | 54 (2.5%)        |
| Warts                            | 17 (0.8%)        |
| Herpes simplex infections        | 10 (0.4%)        |
| Varicella zoster virus infection | 8 (0.37%)        |
| Exanthems                        | 7 (0.3%)         |

encountered were infections and infestations, which were seen in 54.5% of the study population. Negi *et al.*(6) in their study found that infections and infestations contributed to 50% of their cases in Garhwal region of Uttar Pradesh. Various other authors have reported them occurring in the range of 35.6% to 85.2% (6-9). In all these studies, whether institution based or community based, the infections and infestations were the main group of dermatoses. The higher frequency of infections and infestations in our study could possibly be due to large rural population attending our hospital belonging to low socio-economic strata. Roughly, 80% of our cases originated from south Arcot district of Tamil Nadu state, in south India, a predominantly rural area.

Further, these dermatoses may also represent the inadequacies in the primary health care facilities and poor socioeconomic status.

Pyoderma was the most common infection in our study and comprised 47.13% of infections and infestations. In a study conducted in rural Pakistan, pyoderma was the most common disorder in the children(10). In most other studies, pyodermas are the single most common dermatoses(6-10). The presence or absence of biting flies is important in determining the amount of pyoderma, for the irritation and subsequent infection of insect bites appeared to underlie the largest number of cases.

The incidence of scabies has varied from 5.1 % to 22.4% in various studies(6-10). Two school surveys done at Himachal Pradesh and Pondicherry in India had found pediculosis capitis to be the most common dermatological disorder in children(4,11). The decreased frequency of pediculosis capitis in our study could be due to increasing awareness about hair care and hygiene among females.

Incidence of eczemas (8.6%) was low, when compared with western studies where they ranged from 18% to 34%(12-14). Another interesting observation is the rarity of atopic dermatitis in our study population. We had only 3 cases of atopic dermatitis, which accounted for 0.01% of the total children. In contrast, studies from developed countries report a higher incidence ranging from 3.1% to 28% (15). This low frequency of atopy may be related to the dietary habits and climate.

Genetic disorders such as ichthyosis and palmoplantar keratoderma were frequently encountered in our study in contrast to studies by Ghosh *et al.*(9) and Porter *et al.*(10) who did not encounter any of these disorders. The higher occurrence of these keratinization disorders in our population can be explained

### Key Message

The frequency of dermatoses such as infections and infestations, nutritional disorders and environment-associated disorders (insect bite reaction and miliaria) is high in south India.

by the fact that our institute is a referral center. Moreover, the incidence of consanguinous marriage is very high among rural population of our region, which helps in propagation of many genetic disorders in families.

Insect bite reaction (papular urticaria) contributed to 5.27% of the study population. Ghosh *et al.*(9) observed a lower frequency of 4% in their study. Such high frequency of papular urticarias can be explained by the fact that most of these children are from rural or semi urban areas and wear scanty clothing due to climatic conditions and thus being exposed to insect bites. Miliaria is another disorder peculiar to hot and humid tropics, and was seen in 4.1% of the children.

Our study brings into light the unique features of tropical pediatric dermatology such as high frequency of dermatoses like infections and infestations, nutritional disorders and environment associated disorders (insect bite reaction and miliaria). The occurrence of rare genetic and other dermatoses is noticeable as our institute is a referral center and in this society, consanguineous unions are more a way of life. We would like to highlight the fact that many of these dermatoses can be controlled by proper sanitation, improving nutrition and environment.

*Contributors:* DMT and KK were involved in designing the study. KK and BJ collected the data, literature, and wrote the manuscript. DMT critically reviewed and modified the manuscript. DMT shall act as guarantor for the study.

*Funding:* None.

*Competing interests:* None stated.

### REFERENCES

1. Thappa DM. Common skin problems in children. *Indian J Pediatr* 2002; 69: 701-706.
2. Federman DG, Reid MC, Feldman SR, Greenhoe J, Kirsner RS. The primary care provider and the care of skin disease. *Arch Dermatol* 2001; 137: 25-29.
3. Sharma NK, Garg BK, Goel M. Pattern of skin diseases in urban school children. *Indian J Dermatol Venereol Leprol* 1986; 52: 330-331.
4. Sharma NL, Sharma RC. Prevalence of dermatologic diseases in school children of a high altitude tribal area of Himachal Pradesh. *Indian J Dermatol Venereol Leprol* 1990; 56: 375-376.
5. Park K. Preventive medicine in obstetrics, pediatrics, and geriatrics, *In: Park's Textbook of Preventive and Social Medicine*, 17th edn. Ed. Park K, Jabalpur: Banarsidas Bhanot Publishers, 2002: p 359-411.
6. Negi KS, Kandpal SD, Prasad D. Pattern of skin diseases in children in Garhwal region of Uttar Pradesh. *Indian Pediatr* 2001; 38: 77-80.
7. Sharma RC, Mendiratta RC. Clinical profile of cutaneous infections and infestations in pediatric age group. *Indian J Dermatol* 1999; 44: 174-178.
8. Bhatia V. Extent and pattern of pediatric dermatoses in central India. *Indian J Dermatol Venereol Leprol* 1997; 63: 22-25.
9. Ghosh SK, Saha DK, Roy AK. A clinico aetiological study of dermatoses in pediatric age group. *Indian J Dermatol* 1995; 40: 29-31.
10. Porter MJ, Mack RW, Chaudhary MA. Pediatric skin disease in Pakistan. A Study of three Punjab villages. *Int J Dermatol* 1984; 23: 613-617.

BRIEF REPORTS

11. Kumar V, Garg BR, Baruah MC. Prevalence of dermatological diseases in school children in a semi urban area in Pondicherry. *Indian Dermatol Venereol Leprol* 1988; 54: 300-302.
12. Horn R. The pattern of skin diseases in general practice. *Dermatol Pract* 1986; 2: 14-19.
13. Johnson MLT, Roberts J. Prevalence of dermatological disease among person 1-74 years of age. Washington DC: US Department of health and education, National centre for health statistics 1978; PHS 79: 1660.
14. Bowker NC, Cross KW, Fairburn EA, Wall M. Sociological implications of an epidemiological study of eczema in the city of Birmingham. *Br J Dermatol* 1976; 95: 137-144.
15. Foley P, Zuo Y, Plunkett A, Marks R. The frequency of common dermatoses in preschool children in Australia. *Atopic dermatitis. Arch Dermatol* 2001; 137: 298-300.

---

## Cost of Syrup Versus Capsule Form of Vitamin A Supplementation

**K. Anand, R. Sankar, S.K. Kapoor and C.S. Pandav**

*From the Center for Community Medicine, All India Institute of Medical Sciences, New Delhi and Micronutrient Initiative, New Delhi, India.*

*Correspondence to: Dr. K. Anand, Assistant Professor, CRHSP, Ballabgarh, District Faridabad, Haryana 121 004, India. E-mail: crhspaiims@sancharnet.in*

*Manuscript received: April 20, 2003, Initial review completed: August 8, 2003;*

*Revision accepted: October 14, 2003.*

*The study was done to estimate the cost of each dose of vitamin A (2,00,000 Units) to the health system when delivered as a capsule, applicap or as syrup form. The cost of distribution of vitamin A supplements was estimated for the manufacturers, district and delivery level. The lowest cost per dose was for capsules in plastic jar (Rs. 0.99) and the highest was for the syrup in glass bottle (Rs. 1.29), the option currently being practiced. The distribution costs were least for the capsule, which compensates for its higher production cost. The cost of syrup was also more due to high degree of wastage compared to capsules. While cost is an important issue, other operational factors need also to be considered.*

**Key words:** *Cost, Supplement, Vitamin A.*

Globally, approximately 21% of all children suffer from vitamin A deficiency, with the highest prevalence being in South-East Asia(1). A survey in nine states of India in 1999-2000 showed the average intake of vitamin A in children between 1 to 3 years of age to be 106 µg against the recommended dietary allowance of 400 µg. It varied between 71 µg in Andhra Pradesh to 171 µg in West Bengal(2).

In India, currently under the Reproductive

and Child Health (RCH) program, vitamin A supplementation is being carried out to children from six months to three years in the syrup form. The first dose of 1 ml (1 ml = 100,000 units) is given along with measles vaccine at nine months of age and subsequently six monthly doses of 2 ml are given till three years of age. However, despite many years of the program the coverage rates are low. As per the second National Family Health Survey (NFHS-2) in 1998-99, in the