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Original Research Article

A clinico-epidemiological study of non-infectious dermatoses in children between 6-12 years of age

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Abstract

Background: Non-infectious dermatoses in children encompass a wide range of skin conditions unrelated to infectious agents. These disorders are often influenced by nutritional status, climate, genetics, and socioenvironmental factors. Paediatric dermatoses can significantly affect the quality of life and maybe underdiagnosed because of overlapping features with infectious diseases. This study aimed to determine the prevalence and clinical patterns of non-infectious dermatoses in children aged 6–12 years who attended a tertiary care dermatology outpatient department.

Materials and Methods: A hospital-based, cross-sectional observational study was conducted on 190 children aged 6–12 years for 1 year at a multispecialty teaching hospital in Puducherry between October 2019 and October 2020. All patients with non-infectious dermatoses were included. Clinical history and systemic and mucocutaneous examinations were performed, and relevant investigations (KOH mount, Gram stain, Tzanck smear, skin biopsy, and CBC) were performed as required.

Results: Of the 190 patients, 52.1% were men and 47.9% were women. Most children (82.1%) were symptomatic, with pruritus being the most common complaint. Eczematous dermatoses were the most common (44%), followed by papulosquamous disorders (30%), hypersensitivity reactions (9%), and photodermatoses (3%). Other observed conditions included pigmentary (2.5%), keratinisation (2%), appendageal (2.5%), nail (1.5%), and hair (1.5%) disorders, and drug reactions (1%). Rural children comprised the majority (68.4%).

Conclusion: Non-infectious dermatoses are prevalent in school-aged children, with eczematous and papulosquamous disorders being the most common. Awareness, early diagnosis, and targeted treatment are essential for managing morbidity and improving quality of life.

Keywords: Non-infectious dermatoses, Eczema, Paediatric dermatology, Papulosquamous disorders, Atopic dermatitis, Pruritus.

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1. Introduction

Skin conditions are linked to substantial morbidity and are a serious health concern in the paediatric age range. Thirty percent of all paediatrician outpatient appointments are related to skin conditions, and thirty percent of all dermatologist visits involve children.[1] One of the most frequent presentations in a dermatology clinic is paediatric dermatoses, which can be an indicator of a child's health and cleanliness. Geographical location, seasonal and cultural influences, and socioeconomic level all affect the frequency and severity of these skin lesions. [2]

International epidemiological surveys report a prevalence of approximately 9–37% of skin diseases in children across different locations.[3] A school-based study in India data is also similar to international reports, school-based studies have found paediatric skin disease prevalence to be between 8.7% to 38.8% in various regions.[4] These findings highlight that cutaneous conditions are common in school-age children in India and globally, warranting focused clinical attention.

Paediatric skin diseases are often grouped into infectious and non-infectious categories.[3] The non-infectious category

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includes a broad array of disorders such as eczema (atopic, contact, seborrheic, etc.), urticaria, congenital naevi and other birthmarks, drug reactions, pigmentary disorders (vitiligo, post-inflammatory dyschromia), papulosquamous diseases (psoriasis, lichen planus, pityriasis rosea), and keratinisation disorders (e.g. ichthyosis).[5] Additional non-infectious entities include neonatal dermatoses, genetic syndromes, nutritional dermatoses, and diseases of hair, nails, and sweat glands.[2] This diversity of disorders reflects the unique developmental, genetic, and environmental factors affecting paediatric skin.

Among non-infectious paediatric dermatoses, eczematous disorders are particularly prominent. Atopic dermatitis is a leading paediatric skin disease worldwide, with recent data indicating that it affects approximately 15–20% of children.[6] In India, eczemas also predominate: one tertiary-care study found that 47% of non-infectious paediatric cases were eczematous, and atopic dermatitis was the single most common diagnosis (37%).[7] Other frequent non-infectious conditions in children include urticaria (itchy hives) and pigmentary disorders such as childhood vitiligo. Additionally, papulosquamous eruptions (e.g. psoriasis and lichen planus) and keratinisation disorders occur in this age group, albeit less commonly.

The school-age group (6–12 years) is of particular clinical significance. School-going children in India are considered a vulnerable population for skin disorders, influenced by socioeconomic status, climate, hygiene, and nutrition.[4] This age range spans critical years of physical growth and psychosocial development, during which skin diseases can affect self-esteem and quality of life.[7] Moreover, many chronic paediatric dermatoses (such as atopic eczema or vitiligo) typically manifest or persist through this period. Therefore, characterising the burden of non-infectious dermatoses in 6–12-year-olds is essential. The present study aimed to determine the prevalence and pattern of non-infectious dermatoses in this age group at a tertiary care teaching hospital, providing data to guide clinical practice and preventive strategies.

2. Materials and Methods

This cross-sectional observational study was conducted on 190 children diagnosed with non-infectious dermatoses who attended the dermatology outpatient tertiary care teaching hospital in Puducherry for one year from October 2019 to October 2020. The hospital caters to patients from both urban and rural regions of Puducherry and the neighbouring districts of Tamil Nadu.

2.1. Inclusion criteria

Children were eligible for inclusion if they were aged between 6 and 12 years, of either gender and presented with skin conditions of non-infectious aetiology. Only new or untreated cases presenting to the dermatology OPD were included.

2.2. Exclusion criteria

Children were excluded from the study if they were diagnosed with infectious dermatoses, had incomplete clinical data, or declined to participate in the study.

2.3. Methods

All patients underwent a detailed clinical history, general physical examination, and focused cutaneous evaluation. When clinically indicated, relevant laboratory investigations were performed, such as a potassium hydroxide (KOH) mount for suspected fungal elements, Gram staining for bacterial infections, Tzanck smear for vesiculobullous lesions, skin biopsy for histopathological confirmation, and complete blood count (CBC) for systemic evaluation.

Based on clinical examination and diagnostic findings, patients were categorised into groups, including eczematous disorders, papulosquamous disorders, hypersensitivity reactions, photodermatoses, pigmentary disorders, appendageal disorders, keratinisation disorders, drug reactions, and miscellaneous dermatoses. All data are expressed as frequencies and percentages.

3. Results

Eczematous disorders emerged as the most common group, accounting for 109 cases, representing 57% of all non-infectious dermatoses. Papulosquamous disorders were the second most frequent, comprising 32 cases (30%), highlighting the significant clinical burden of conditions such as psoriasis and lichen planus, which are chronic and often require long-term dermatological care.

Hypersensitivity disorders accounted for 18 cases (9.4%), reflecting a moderate presence often associated with acute conditions such as urticaria and insect bite reactions. Photodermatoses, pigmentary disorders, and keratinisation disorders each contributed five cases (2.5%), indicating their relatively lower frequency but notable diversity in presentation. Drug reactions, appendageal disorders, and hair disorders were less commonly observed, each comprising only 1–2 cases (1%), whereas nail disorders were the least represented, with a single case (0.5%) **(Table 1)**.

Table 1: Distribution of the total number of non-infectious dermatoses

Non-infectious dermatoses	Count (%)
Eczematous disorders	109 (57%)
Papulosquamous disorder	32 (30%)
Hypersensitivity disorders	18 (9.4%)
Photodermatoses	5 (2.5%)
Pigmentary disorders	5 (2.5%)
Nail disorders	1 (0.5%)
Hair disorders	2 (1%)
Appendegeal disorders	2 (1%)
Drug reactions	2 (1%)
Keratinisation disorders	5 (2.5%)
Miscellaneous disorders	9 (4.7%)

Eczematous conditions were more common, with eczema (42.2%) and atopic dermatitis (31.2%) comprising the majority, followed by pityriasis alba, seborrheic dermatitis, and a few less frequent types. In contrast, papulosquamous disorders were more evenly spread, with lichen striatus (25%), lichen planus (21.9%), and lichen nitidus (18.8%) being the most prevalent **(Table 2)**.

Table 2: Distribution of eczematous and papulosquamous disorders

Types	Disorders	Count (%)
Eczematous disorders	Eczema	46(42.2%)
	Atopic dermatitis	34(31.2%)
	Pityriasis alba	14(12.8%)
	Seborrheic dermatitis	7(6.4%)
	Irritant contact dermatitis	4(3.7%)
	Juvenile plantar dermatoses	3(2.8%)
	Allergic contact dermatitis	1(0.9%)
Papulosquamous disorders	Guttate psoriasis	4(12.5%)
	Juvenile pityriasis rubra pilaris	4(12.5%)
	Lichen planus	7(21.9%)
	Lichen nitidus	6(18.8%)
	Lichen striatus	8(25%)
	Lichenoid drug eruption	2(6.3%)
	Pityriasis lichenoides chronica	1(3.1%)

Acute urticaria was the most frequent condition, accounting for 55.6% of cases, followed by insect bite reactions (27.8%), with other conditions such as prurigo nodularis and id eruption being less common. In the appendageal disorder group, acne vulgaris and alopecia areata were equally represented (40% each), whereas brachydactyly was observed in a smaller proportion (20%). Drug reactions such as Stevens-Johnson syndrome (SJS) were observed in 0.5% of cases. The keratinisation disorders were equally distributed, with all five conditions–acanthosis nigricans, ichthyosis vulgaris, lamellar ichthyosis, phrynoderma, and pigmentary mosaicism–each accounting for 20% **(Table 3)**.

Table 3: Distribution of hypersensitivity, appendageal dermatoses and keratinisation disorders

Types	Clinical condition	Count (%)
Hypersensitivity dermatoses	Acute urticaria	10(55.6%)
	Insect bite reactions	5(27.8%)
	Prurigo nodularis	2(11.1%)
	Id eruption	1(5.6%)
Appendegeal dermatoses	Acne vulgaris	2(40%)
	Alopecia areata	2(40%)
	Brachydactyl	1(20%)
Keratinisation disorders	Acanthosis nigricans	1(20%)
	Ichthysosis vulgaris	1(20%)
	Lamellar ichthyosis	1(20%)
	Phyrenoderma	1(20%)
	Pigmentary mosaicism	1(20%)

4. Discussion

In our study, eczematous disorders were the most prevalent (24.1%), and 17.9**%** of the patients had atopic dermatitis. Aligning with our findings, Mahalingam et al. also found eczema (24.14%) as the leading condition in their study of 550 patients, with atopic dermatitis comprising 26.31% of eczematous cases.[8]

In our study, the prevalence of pityriasis alba (7.3%), seborrheic dermatitis (3.7%), irritant contact dermatitis (2.1%), and allergic contact dermatitis (0.5%). Similar findings were observed by Banerjee et al., that 22.98% of their patients had eczematous dermatoses, and seborrheic dermatitis was more common (13.42%).[9]

In our study, papulosquamous disorders were the second most common group (30%). Among these, lichen striatus was the most frequent (4.2%), followed by lichen planus (3.2%), lichen nitidus (2.6%), juvenile pityriasis rubra pilaris (2.2%), and guttate psoriasis (2.1%). In contrast, Tadepalli et al. in their study on 65 patients reported different distributions, with lichen planus dominating (64.6%), followed by psoriasis (24.6%) and pityriasis rubra pilaris (3.1%), representing possible geographic or environmental influences.[10]

Among the hypersensitivity dermatoses cases in our study, acute urticaria was the most common (5.3%), followed by papular urticaria (1.6%), insect bite reactions (1%), and prurigo nodularis (1.1%). Supporting our findings, Sacchidanand et al. in their study on 1090 patients reported a similar prevalence of insect bite reactions and papular urticarial (5.1% each).[11] However, in contrast to our study, Karthikeyan et al., who conducted a 1-year study on 2100 patients and recorded 2144 dermatoses, reported findings lower than ours. They reported that insect bite reactions (5.27%) and papular urticaria (5.27%) were the most common, followed by acute urticaria (2.5%) in their paediatric population.[12] This suggests the possible influence of environmental exposure, especially in rural areas.

In our study, among appendageal disorders, alopecia areata and acne vulgaris were equally represented (1.1% each), whereas brachydactyly was rare (0.5%). Similar to our findings, Frenard et al. conducted a 6-month study on 190 patients and reported that alopecia and brachydactyly were reported the least (1.1% and 0.5%, respectively).[13] In contrast, Al Refu et al. in their study on 2800 patients, reported a higher incidence of alopecia areata (26.2%), often presenting with patchy, asymptomatic hair loss.[14]

In our study, drug reactions such as SJS were observed in 0.5% of cases, and keratinisation disorders such as ichthyosis vulgaris, acanthosis nigricans, and pigmentary mosaicism accounted for one patient each. This aligns with the findings of Madasani et al., who conducted a 2-year study on 472 patients and reported 0.23% drug reactions in their pediatric cohort and only 2 patients were affected with

ichthyosis vulgaris.[15] In addition, Sacchidanand et al. also reported a low prevalence of pigmentary disorders (5.81%).[11]

In our study, other less frequent dermatoses included miliaria rubra (1.1%), polymorphic light eruption (2.1%), and uncommon lesions such as keloids, granuloma annulare, and id eruption, each accounting for 0.5–1.1%. Similarly, Vani et al. conducted a study on 2075 patients and reported polymorphous light eruption (PMLE) as a less frequent dermatoses (1.1%), and they also explain the condition as "hardening", a phenomenon in sun-acclimated children.[16]

This study underscores the predominance of eczematous dermatoses, especially atopic dermatitis, in school-aged children, consistent with both Indian and global data. The diversity of the observed conditions highlights the importance of regional epidemiological studies in tailoring dermatological care and preventive strategies. Comparisons with previous research not only validate the findings but also reveal the potential geographic, environmental, and socioeconomic influences on disease prevalence and patterns.

5. Conclusion

Eczematous and papulosquamous disorders are predominant among school-aged children, with eczema and atopic dermatitis being the most common dermatological morbidities. The clinical diversity observed in non-infectious dermatoses emphasises the need for region-specific data to understand the underlying risk factors and guide healthcare delivery. Environmental exposure, hygiene, nutritional status, and socioeconomic conditions appear to influence the prevalence and patterns of these skin conditions. Routine screening, dermatological awareness programs, and parental education can help in the early identification and management of this condition, thereby reducing long-term morbidity and psychosocial impact in children.

6. Ethical approval

This study was approved by Institution ethical committee with ref. no. SVMCH/IEC/2019-Nov/2.

7. Abbreviations

CBC - Complete Blood Count; KOH - Potassium Hydroxide; SJS - Stevens-Johnson Syndrome; PMLE - Polymorphic Light Eruption; OPD - Outpatient Department.

8. Conflict of Interest

None.

9. Source of Funding

None.

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