

PATTERN OF SKIN DISORDERS IN A DERMATOLOGY CLINIC IN SOUTHERN NIGERIA: A PRIVATE PAEDIATRIC HOSPITAL EXPERIENCE**¹Boma Awoala West and ²Enekole Josephine Aitafo**

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ABSTRACT

Background: Skin diseases are a major health problem that leads to discomfort, distress and disability thereby affect the quality of lives of children as well as their families and communities. **Methods:** A retrospective study was carried out on all children (0-17years) attending the Dermatology clinic in a private paediatric hospital, Rivers State over 2 years. Relevant data was retrieved from the hospitals' Health Management System and analysed.

Results: Of 255 children recruited, children aged < 5years predominated 126(49.4%) with mean age of 5.21 ± 3.99 years and a Male: Female ratio of 1.2:1. Thirty-four individual skin disorders were seen of which atopic dermatitis 47(19.3%) was the commonest followed by scabies 35(14.3%), papular urticaria 29(11.9%), palmoplantar keratoderma 20(8.2%) and seborrheic dermatitis 17(7.0%). Eczema 68(28.0%) was the commonest class seen followed by parasitic infestations 35(14.4%) and hypersensitivity reactions 30(12.3%). Papulo-squamous skin disorders were significantly more in females, atopic dermatitis and palmoplantar keratoderma in males while pityriasis rosae was significantly more in females. Palmoplantar keratoderma was seen significantly more in children above 5 years whereas molluscum contagiosum and miliaria were significantly more in those less than 5 years. **Conclusion:** Atopic dermatitis, scabies and papular urticaria were the commonest skin disorders observed with male predominance. The importance of dermatology units even in private health facilities cannot be overemphasized for accurate and timely diagnosis which would improve the quality of lives of children and their families. Health education on exclusive breast feeding, avoidance of overcrowding, personal hygiene and environmental sanitation will also prevent skin disorders.

KEYWORDS: Skin Disorders; Pattern; Private Hospital; Nigeria.**INTRODUCTION**

Skin diseases are a major health problem affecting many children worldwide causing discomfort, distress and disability.^[1] Apart from many biological functions such as sensation, excretion and thermoregulation, the skin serves as the boundary between self and the environment, functioning as a critical barrier to dehydration and infection.^[2] Therefore interruption of its' normal function can lead to significant morbidity and even mortality.^{[1],[2]} They often produce lesions that are cosmetically disfiguring and thus may result in poor self-image, great emotional distress and embarrassment to the child and even the parents.^{[1],[2],[3]} It could also lead to stigmatization, loss of function, psycho-social and even psychiatric disorders like depression with suicidal tendencies.^[2] Morbidity is particularly worse when skin disorders are associated with severe illnesses such as septicemia, carditis and glomerulonephritis.^[2]

The prevalence of skin disorders in children attending paediatric out-patient clinics have been reported to be from 1.3%^[4] in a study done at Enugu, southeast Nigeria to as high as 24% from a United States based study.^{[3],[5]}

Predisposing factors to skin disorders include poor personal hygiene, low socio-economic status, low parental level of education and overcrowding.^{[1],[6],[7]}

The pattern of skin disorders varies from place to place depending on several factors such as ecology, race, literacy levels, social and environmental factors.^{[1],[6],[8]} In developing countries, infective disorders such as scabies and pyoderma are a major cause of visits to primary health care facilities, whereas eczematous disorders such as atopic dermatitis are commoner presentations in dermatology clinics.^{[1],[8],[9]} However, community based studies have shown dermatophytosis

as being most common among school children in both urban and rural settings in Nigeria.^{[1],[7],[10],[11]}

Certain skin disorders are more common in younger children than adolescents as reported by a study in Ile-Ife which reported dermatophyte infections as most prevalent in children and acne vulgaris in adolescents.^[12] A study in Thailand also reported atopic dermatitis as a skin disorder that begins in childhood (1-6 years) and weans after 10 years.^[3] They also reported skin infections including fungal, bacterial, parasitic and viral infections (such as dermatophytosis, impetigo, scabies, and lice) as being most common among young children and largely caused by overcrowding, poor hygiene, negligence and lack of awareness.^[3] A study in India also reported infections and infestations as being common in nearly half the cases followed by dermatitis.^[13] They also reported allergic skin reactions, hair and nail disorders in 5-6% of cases.^[13]

Early diagnosis with prompt and adequate treatment of skin disorders in children help to reduce morbidity, limit disfigurement of the patients and mitigate the deleterious effects of these conditions on the child, family and community at large.

There is a paucity of recent data on the pattern of skin diseases in children in the southern part of Nigeria. This study therefore aims at determining the pattern of skin diseases as seen in a dermatology clinic in a private hospital in southern Nigeria. This would add to the knowledge base and provide data which may be useful in the planning of health care programs and to increase awareness about skin disorders in children in this sub-region.

MATERIALS AND METHODS

This was a retrospective study involving all children who attended a dermatology clinic in a private paediatric hospital in Port Harcourt, Rivers State, over 2 years (from 1st of January, 2022 to 31st of December, 2023). The study centre, a 38-bedded private hospital, is well-equipped with a neonatal unit, children's wards, radiology unit and medical laboratory with blood bank services. Age group seen was 0-17 years with an average monthly out-patient attendance rate of 1250-1500 children (both general and specialist cases) and an average monthly admission rate of 80-100 children per month. Its' staff strength included 8 paediatricians including a paediatric dermatologist, surgeons, nurses and other support staff.

Data of all children seen in the Dermatology clinic during the study period was retrieved from the hospitals' Health Management System. Information obtained included age, sex, clinical features, diagnosis, and results of investigations. Children with incomplete clinical or laboratory data were excluded from the study.

Children seen were examined completely from head to toe in a well-lit consulting room. Where indicated, confirmatory and other supportive laboratory investigations were carried out. Diagnosis of fungal infections was made clinically and also by microscopic examination of skin scrapings using potassium hydroxide(KOH) preparation. Skin disorders were classified according to the second edition of the International Classification of Primary Care.^[2]

Children diagnosed with the various dermatologic disorders were treated according to standard protocols on out-patient basis or on admission depending on the severity and presence of other illnesses.

Data was recorded in an Excel spreadsheet and analysed using SPSS version 23. Results were presented as frequency, percentages, pie and bar charts. Test of association was done using Chi square (χ^2) test and Fishers' Exact test. Statistical significance was set at P value $< .05$.

RESULTS

Age and sex distribution of the study population

Of 255 children who attended the dermatology clinic of the hospital, children aged < 5 years predominated 126(49.4%) with mean age of 5.21 ± 3.99 years. There were more males 139(54.5%) than females with Male: Female ratio of 1.2:1, Table I.

Table I: Age and sex distribution of the study population.

Variables	Frequency, n=255 (%)
Age group (years)	
< 5	126 (49.4)
5-10	104 (40.8)
>10	25 (9.8)
Sex	
Male	139 (54.5)
Female	116 (45.5)

Pattern of individual skin diseases

There were 34 individual skin disorders seen in the dermatology clinic of which atopic dermatitis 47(19.3%) was the commonest followed by scabies 35(14.3%), papular urticaria 29(11.9%), palmoplantar keratoderma 20(8.2%) and seborrheic dermatitis 17(7.0%), Table II.

Table II: Pattern of individual skin disorders.

Skin disorders	Frequency, n (%)
Atopic dermatitis	47 (19.3)
Scabies	35 (14.3)
Papular urticaria	29 (11.9)
Palmoplantar keratoderma	20 (8.2)
Seborrheic dermatitis	17 (7.0)
Tinea	15 (6.1)
Pityriasis rosea	13 (5.3)
Vitiligo	6 (2.5)
Molluscum contagiosum	6 (2.5)
Miliaria	5 (2.0)
Post inflammatory hypo/hyperpigmentation	5 (2.0)
Xerosis	4 (1.6)
Ichthyosis	4 (1.6)
Candidiasis	3 (1.2)
Intertrigo	3 (1.2)
Acne	3 (1.2)
Exfoliative dermatitis	3 (1.2)
Granuloma Annulare	3 (1.2)
Psoriasis	2 (0.8)
Trichomycosis	2 (0.8)
Naevus	2 (0.8)
Hand-Foot-Mouth disease	2 (0.8)
Keloid scar	2 (0.8)
Others	13 (5.2)

Spectrum of skin disorders in children
Eczema 68(28.0%) was the commonest class of skin disorders seen followed by parasitic infestations

35(14.4%) and hypersensitivity reactions 30(12.3%),
Table III.

Table III: Spectrum of skin disorders in children.

Spectrum of skin disorders	Frequency, n (%)
Eczema	68 (28.0)
• Atopic dermatitis	47
• Seborrheic dermatitis	17
• Exfoliative dermatitis	3
• Pompholyx	1
Parasitic infestations	35 (14.4)
• Scabies	35
Hypersensitivity reactions	30 (12.3)
• Papular urticaria	29
• Erythema multiforme	1
Papulo-squamous diseases	19 (7.8)
• Pityriasis rosea	13
• Ichthyosis	4
• Psoriasis	2
Fungal skin infections	18 (7.4)
• Tinea	15
• Candidiasis	3
Pigmentary diseases	11 (4.5)
• Vitiligo	6
• Post-inflammatory hypo/hyperpigmentation	5
Viral skin infections	10 (4.1)
• Molluscum contagiosum	6
• Hand-foot-mouth disease	3
• Plain warts	1
Pilosebaceous diseases	9 (3.7)

• Miliaria	5
• Acne vulgaris	3
• Verruca vulgaris	1
Genodermatosis	7 (2.9)
• Naevus	3
• Granuloma annulare	2
• Ectodermal dysplasia	1
• Heamangioma	1
Bacterial skin infections	3 (1.2)
• Tichomycosis	2
• Kerion	1
Unclassified	33 (13.6)

Distribution of skin disorders (unclassified)

The commonest skin disorders unclassified in table III were palmoplantar keratoderma and xerosis. Figure 1.

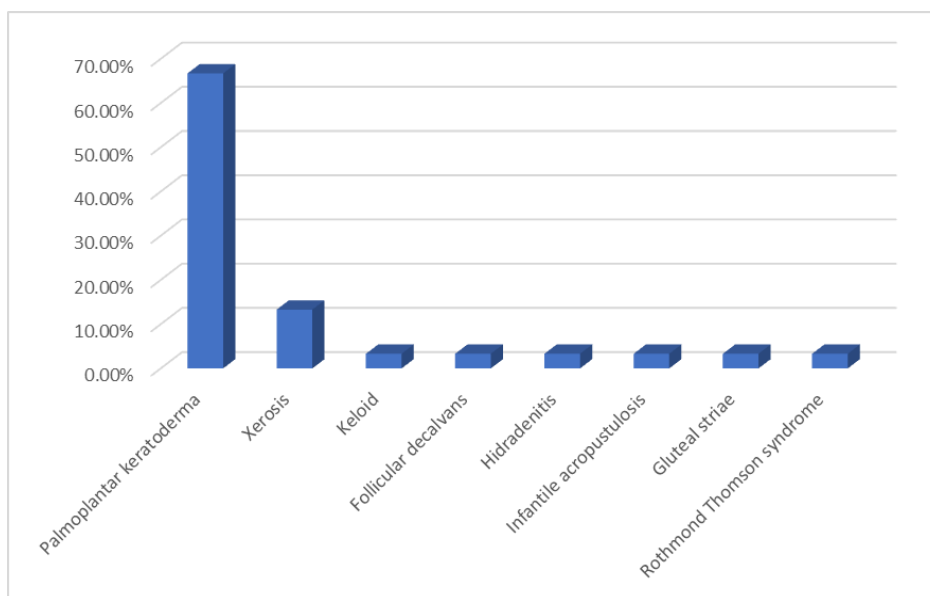


Figure 1: Distribution of skin disorders (unclassified).

Pattern of spectrum of skin disorders by sex

Papulo-squamous skin disorders were significantly observed in females more than in males ($P=0.015$), Table IV.

Table IV: Pattern of the spectrum of skin disorders by sex.

Skin disorders	Sex		P value
	Male, n (%)	Female, n (%)	
Eczema	40 (28.8)	28 (24.1)	0.477
Parasitic infestation	23 (16.5)	12 (10.3)	0.201
Hypersensitivity reaction	14 (10.1)	16 (13.8)	0.436
Papulosquamous diseases	5 (3.6)	14 (12.1)	0.015*
Fungal skin infection	9 (6.5)	9 (7.8)	0.807
Pigmentary diseases	4 (2.9)	7 (6.0)	0.234
Viral skin infections	6 (4.3)	4 (3.4)	0.759
Pilosebaceous diseases	6 (4.3)	3 (2.6)	0.516
Genodermatosis	3 (2.2)	4 (3.4)	0.705
Bacterial skin infections	0	3 (2.6)	0.093

*=Statistically significant

Pattern of individual skin disorders by sex

Atopic dermatitis and palmoplantar keratoderma were significantly more in males ($P = 0.023$ and 0.004

respectively) while pityriasis rosea was significantly more in females ($P = 0.023$), Table V.

Table V: Pattern of individual skin diseases by sex.

Skin disorders	Sex		P value
	Male, n (%)	Female, n (%)	
Atopic dermatitis	33 (23.7)	14 (12.1)	0.023*
Scabies	23 (16.5)	12 (10.3)	0.201
Papular urticaria	14 (10.1)	15 (12.9)	0.554
Palmoplantar keratoderma	17 (12.2)	3 (2.6)	0.004*
Seborrhoeic dermatitis	4 (2.9)	13 (11.2)	0.011*
Tinea	8(5.8)	7 (6.0)	1.000
Pityriasis rosea	3 (2.2)	10 (8.6)	0.023*
Vitiligo	2 (1.4)	4 (3.4)	0.416
Molluscum contagiosum	3 (2.2)	3 (2.6)	1.000
Miliaria	4 (2.9)	1 (0.9)	0.380
Post inflammatory hypo/hyperpigmentation	2 (1.4)	3 (2.6)	0.662

*=Statistically significant

Pattern of individual skin disorders by age groups

Palmoplantar keratoderma was significantly more in children above 5 years ($P = < 0.001$) while molluscum

contagiosum and miliaria were significantly more in children less than 5 years ($P = 0.014$ and 0.028 respectively), Table V.

Table V: Pattern of individual skin disorders by age groups.

Skin disorders	Age groups		P value
	< 5 years, n (%)	≥ 5 years, n (%)	
Atopic dermatitis	23 (18.3)	24 (18.6)	1.000
Scabies	22 (17.5)	13 (10.1)	0.102
Papular urticaria	19 (15.1)	10 (7.8)	0.077
Palmoplantar keratoderma	1 (0.8)	19 (14.7)	<0.001*
Seborrhoeic dermatitis	6 (4.8)	11 (8.5)	0.316
Tinea	6 (4.8)	9 (7.0)	0.596
Pityriasis rosea	3 (2.4)	10 (7.8)	0.084
Vitiligo	1 (0.8)	5 (3.9)	0.213
Molluscum contagiosum	6 (4.8)	0	0.014*
Miliaria	5 (4.0)	0	0.028*
Postinflammatory hypo/hyperpigmentation	2 (1.6)	3 (2.3)	1.000

*=Statistically significant

DISCUSSION

Skin disorders are among the leading causes of morbidity in children. This is because they have weak skin barriers with low immunity in addition to poor hygiene. Skin disorders could affect a child's quality of life and impact negatively on their wellbeing as well as family members as it may result in school absenteeism, psychological distress especially in older children with increased financial burden which is usually the case in most developing countries where health insurance is still at its rudimentary stages of development.

Children aged less than 5 years were mostly reported to have skin disorders accounting for close to $\frac{1}{2}$ (49.4%) whereas children aged more than 10 years (9.8%) were the least affected in the present study. The preponderance of the younger age group in the present study is not surprising as they are most vulnerable to infections and infestations as a result of their lower immunity, weaker skin barriers and much poorer hygiene as compared to

the older children.^{[14],[15]} This finding of the present study was similarly reported in a previous study in Port Harcourt^[16] carried out close to two decades ago as well as other studies in India^[17] and South Africa.^[18] Children aged less than 2 years predominated in other parts of Nigeria^{[19],[20]} whereas children less than 1 year were reported in Ethiopia.^[21] In contrast however, older children above 5 years predominated in other parts of Nigeria,^{[1],[22]} Cote d' Ivoire^[23] and Brazil.^[24] These differences could be attributed to the varying age classification, pattern of skin disorders, geographic locations as well as the varying study population and study designs.

Males predominated in the present study with a Male: Female ratio of 1.2: 1. This was consistent with several other studies^{[18],[20],[21],[23],[24],[25],[26],[27],[28]} but in few other studies,^{[1],[16],[22],[29],[30]} the reverse was the case. The male preponderance observed in the present study may not be unrelated to the usual male predisposition to

infections/infestations due to the presence of a single X-chromosome as compared to females who have two X-chromosomes and thus have more protective effects.^[31] In addition, male children are more likely to be brought to the hospital than their female counterparts because of the greater importance placed on male children as seen in many African communities. Males are also more adventurous and thus more likely to play outside the home which may predispose them more to skin disorders. This difference could also be attributable to the pattern of skin disorders whose prevalence may vary with gender.

In the present study, eczema was the commonest group of skin disorders observed accounting for more than 1/4th (28.0%) of cases followed by parasitic infestations (14.4%) and hypersensitivity reactions (12.3%). In addition, based on the individual skin disorders, atopic dermatitis (19.3%) an eczematous skin lesion was the commonest skin disorder observed in the present study followed by scabies (14.3%) a parasitic infestation and papular urticaria (11.9%) a hypersensitivity reaction. Eczematous or inflammatory skin disorders was similarly reported by Ayanlowo et al,^[1] Katibi et al,^[18] Miotto et al^[24] and Saini et al^[26] as the commonest group of skin disorders in Lagos (Nigeria), South Africa, Brazil and India respectively. Interestingly in these studies, atopic dermatitis was observed to be the commonest eczematous skin disorder as documented in the present study. Eczematous skin disorders/atopic dermatitis was documented as the 2nd commonest skin disorder reported in other parts of Nigeria,^{[16],[22]} Ethiopia,^[21] Saudi Arabia,^[27] Madagascar^[30] and Pakistan.^[32] It is noteworthy that atopic dermatitis, a chronic relapsing inflammatory skin disorder could affect the quality of life of children as it leads to poor quality of sleep because of its' intense itching and thus could result in poor school performance. Its' aetiology is not well known, however it has been linked to environmental and genetic factors.^[33] Its' rising prevalence in Nigeria has been associated with the early introduction of cow's milk with the declining exclusive breastfeeding rate. Thus, early diagnosis and treatment even by medical officers will help reduce its' burden. In addition, promotion of breast feeding (both exclusive breast feeding and continued breast feeding up to at least 2 years) through health education would also prevent this condition. Contrary to the present study, infections/infestations were documented as the commonest skin disorders in some other studies in Nigeria,^{[1],[2],[20],[22]} India,^[17] Ethiopia,^[21] Saudi Arabia^[27] and Madagascar.^[30] In addition, papular urticaria was the commonest individual skin disorder documented in an earlier study in Port Harcourt^[16] carried out much earlier than the present study whereas acne vulgaris was the commonest in Ibadan,^[25] southwest Nigeria and Hong Kong.^[28] These differences could be attributed to the different geographic locations, genetic predispositions, seasonal variations, the different study populations in relation to the age groups studied as well as varying socioeconomic

status, sample sizes and seasons of the year when the studies were carried out. The low prevalence of infection/infestations in the present study could be because not all dermatological cases were seen in the dermatology clinic. Most simple skin infections as well as simple skin disorders were usually treated by the other paediatricians and medical officers. The very low prevalence of acne vulgaris in the present study is not unexpected as the adolescent population who are mostly at risk of this condition was very minimal (9.8%) unlike in the Ibadan^[25] and Hong Kong^[28] studies where adolescents were mainly studied.

Scabies (14.3%) was the 2nd commonest individual skin disorder observed in the present study as similarly reported by Ayanlowo et al^[1] in Lagos, Nigeria. In contrast, Majeed et al^[32] in Pakistan reported scabies as the commonest individual skin disorder while in Cote d'Ivoire,^[23] it was the 3rd commonest individual skin disorder documented accounting for 0.9% of cases. Similarly, Ewurum et al^[2] in their cross-sectional descriptive study of primary school children aged 5-15 years in Umuahia, southeast Nigeria showed that of all infective skin disorders reported, scabies was the 3rd commonest accounting for 8.9% after tinea capitis (63.4%) and pityriasis versicolor (11.4%). Also, parasitic infestations were documented as the 3rd commonest skin infection of all paediatric age group with scabies (6.7%) being the most prevalent in a study in India.^[26] Scabies caused by the mite, *Sarcoptes scabiae* is a highly itchy and contagious skin disorder. Symptom is caused by the burrowing of the mites under the skin with the release of toxic substances. This could lead to poor quality of sleep in children with possible affectation of their school performance. It is pertinent to note that poor personal hygiene, overcrowding living conditions and low socioeconomic status are some of the predisposing factors to scabies infestation.^{[6],[7],[10]} Health education of parents/caregivers will therefore go a long way to improve personal hygiene, sanitation and avoid overcrowding thereby prevent the spread of these infections/infestations.^{[6],[11]}

Papular urticaria (11.9%) was the 3rd commonest of all skin disorders in the present study as similarly documented by Ewurum et al^[2] and Ogunbiyi et al^[25] in Umuahia, Southeast and Ibadan, Southwest Nigeria where it accounted for 34.4% and 8.5% respectively. In a similar study in Lokoja, Nigeria carried out over 6 months, Oyeleke et al^[19] documented papular urticaria as the 2nd commonest non-infective skin disorder accounting for 0.8% of cases. In contrast, in a previous study carried out close to 2 decades ago in the same study centre (Port Harcourt) papular urticaria was reported as the commonest skin disorder. The reason is not far-fetched as the latter study was done majorly during the rainy season between June and November when there is usually high incidence of insect bites that could lead to this condition. The present study in contrast was carried out over 2 years from January to December

in both years. In addition, over time, better development of the city, may have led to some reduction in the prevalence of papular urticaria. It is worthy of note that papular urticaria results from an exaggerated response to the bites of insects and it is seen majorly in urban and suburban areas with increased insect population. It is commonly seen in areas with poor environmental sanitation, poor drainage systems with un-weeded and over grown lawns or bushes which encourages the breeding sites for biting insects. Environmental sanitation is therefore key in the reduction of the prevalence of papular urticaria.

Atopic dermatitis was observed to occur significantly more in males than in females ($P = 0.023$) in the present study. Katibi et al^[18] in a similar study of children aged 0-18 years in Durban, South Africa documented a significantly higher preponderance of males with dermatitis (OR 1.57; CI 1.13-2.19, $P = 0.007$). The contrary was the case in Kano as reported by Yahya.^[20] In addition, Majeed et al^[32] in Pakistan showed that scabies was significantly observed more in males than in females ($P = 0.012$) which was similar to findings in the present study although there was no statistically significant association ($P = 0.201$). Similar to the latter, Khalifa et al^[29] in their study in Iraq documented no significant association between the sex and the prevalence of skin diseases.

Palmoplantar keratoderma ($P < 0.001$) was observed to be significantly more in children ≥ 5 years while molluscum contagiosum ($P = 0.014$) and miliaria ($P = 0.023$) were observed significantly in children < 5 years. This was at variance with a 3 months cross-sectional survey of 2160 school children from 30 primary schools in Bagdad,^[29] Iraq in which no significant association was documented between the prevalence of skin diseases and age ($P = 0.06$). This difference could be because the present study was hospital based and age range was 0-17 years unlike in the latter study which was a school-based study and only the school age was considered. A 7 months descriptive cross-sectional study in Pakistan^[32] on children aged 0-17 years showed that eczema ($P = 0.000$) and dermatitis ($P = 0.014$) were significantly more prevalent among infants and toddlers (0-4 years). A contrary finding was documented in the present study although there was no statistical significance.

CONCLUSION

Most skin disorders were seen in children < 5 years of age with male preponderance. The commonest groups of skin disorders seen were eczematous skin disorders followed by parasitic infestations and hypersensitivity reactions with the commonest individual skin disorders being atopic dermatitis, scabies and papular urticaria in descending order.

The importance of dermatology units even in private health facilities therefore cannot be overemphasized as accurate and timely diagnosis are ensured which would

reduce morbidity, improve the quality of lives of children, their families and communities as well as prevent the negative psychosocial impact of these skin disorders. Health education of the masses on the importance of exclusive breast feeding and continuing breastfeeding for at least 2 years, avoidance of overcrowding, personal hygiene and environmental sanitation will also go a long way in the prevention of most skin disorders.

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