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Pattern of Skin Diseases in Children Attending the Dermatology Clinic in Al-Gamhoria Teaching Hospital, Aden, Southern Yemen

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ABSTRACT

Background: Skin diseases constitute a major health problem affecting a large proportion of the population including children causing distress and disability. This study aimed to determine the pattern and frequency of skin diseases.

Methods: A retrospective hospital-based, cross-sectional study of all children up to 14 years old who attending dermatology clinic of Al-Gamhoria teaching hospital, Aden Yemen from January to December 2022.

Results: Out of 3,184 patients, pediatric patients constituted 191 (6%),56.5% were boys and 43.5 were girls. Maximum number of patients were in the age group of >1-5 years. Majority of dermatoses belonged to infections (45.1%), followed by eczema (20.9%) Bacterial infections (19.9 %) were the most common infections followed by fungal (17.3%), viral (7.9 %) and infestation constituted (13.1%). The majority of patients had one disease, (95.3%) while the rest had two diseases (4.7%).

Conclusions: in the present study, infections and eczema were the most common dermatological conditions. This study provides insight about the pattern of various dermatoses among children in urban setting.

Keywords: Pattern, skin disorders, children, hospital –based

INTRODUCTION

Skin disorders occur all over the world at a significant level and pose a significant public health burden both in developing and developed countries. [1] According to WHO, prevalence studies of the general population in developing countries reported high prevalence figures for skin diseases (21-87%).[2] In comparison to adults' children are more susceptible to acquire skin infection because of weak skin barrier, low immunity and poor hygiene. Skin diseases account for a significant proportion of pediatric consultations (6–24%). [3-5]

The pattern of skin disease varies from one country to another and even from one district to another inside the same country because of natural variables, hygienic standards social traditions and hereditary. [6,7]

Skin diseases affect all ages from neonate to elderly [8]. While some of them manifest mainly or exclusively in children it causes harm in a number of ways and can have a profound effect on both the individual and the community. The skin condition can affect quality of life, especially in vulnerable population such as the elderly, women, and children.[9]

It is very important to remember that skin manifestations may be a clue as to the patient's internal disease, but literature on the pattern of skin diseases is deficient. Early identification of skin disease is important not only for treating patients but also for preventing the spread of communicable diseases. [10]

Skin diseases in children require a separate approach from adults because of differences in clinical presentation, treatment and

prognosis. In south Yemen, no study done on pediatric skin diseases. Thus, there is a need to have accurate knowledge of the skin diseases affecting children in this area that will provide baseline data for future surveys.

MATERIALS & METHODS

Material and Methods

A retrospective analysis was carried out for pediatric children up to age 14 years of either sex who presenting with skin problems at the dermatology clinic of Al - Gamhorrhia multispecialty teaching hospital, Aden, Yemen from January to December 2022.

The hospital received patients of all age groups from all districts and those referred from other Governorates.

The children were stratified into the following age groups: Infants up to 1 year, toddlers and preschoolers (>1-5 years) school age (6- 10 years), and adolescents (11 to 14 years). The diseases were classified into 10 groups according to their etiology and organs involved. Data obtained from registry books of the patients included the age, gender, and diagnosis.

STATISTICAL ANALYSIS

A uniform data abstraction sheet was prepared to collect the relevant data from the registers. Statistical package for social sciences (SPSS), version 15 was used to descriptive statistics. Means and standard deviations were calculated for quantitative variables such as age. Frequency and percentages were used to analyze qualitative variables like gender and diagnoses of skin. Differences between proportions of categorical variables were evaluated using the Chi-square test and level of significance was placed at P value < 0.05.

RESULTS

Out a total of 3,184 patients, 191 patients were recruited in the study. There were about 56.5% boys and 43.5% were girls. The age range noted was 2 months to 14 years with a mean age 7.10 ± 4.098 years. (Table 1). The majority (182, 95.3 %) of patients had one disease, while, (9 patients , 4.7 %) of them had two skin diseases at the same time (Fig.1). From those with multiple skin diseases 7 (3.6 %) as secondary pyoderma, 2 (1%) more than one eczematous disorder The most common group of dermatoses in this study was, infections (45.1 %), followed by eczematous conditions (20.9 %), infestations (12,9 %), and hypersensitivity disorders (5.2 %). The least common diseases were kertinization disorders two cases, pityrasis rosaea, lichen nitdus, chronic bullous disease of childhood and infantile hemangioma each single case.

Among infectious disease, bacterial infections (19.9 %) were the most common skin infections followed by fungal (17.3 %), and viral infections (7.9 %). Impetigo was the commonest bacterial infection, followed by frunclosis (4.2%), cellulitis (2.1%) and single case of folliculitis (0.5 %).

Of fungal infection, tinea capitis (6.8 %), was the most common type of dermatophyte infection, followed by tinea corporis (3.1 %) tinea faciei (1.0%), and tenia pedis (0.5 %). Pityriasis versicolor occurred in 9 patients (4.7 %), candidia infection observed in two cases (1 %), one candial intertigo and the other case was parnochyia.

Scabies was the most documented parasitic infestation in children with total cases of 18 patients, followed by pediculosis capitis with total cases of 4 patients. Protozoal infestation (leishmanasis) was found in 3 patients (1.5%).

Verucae (common wart) was the most frequent viral infections (4.2 %) followed by varicella and herpes zoster with same frequency (1.6%). Infectious skin diseases were the most common skin diagnoses observed in preschool and school age children Distribution of various skin disorders across various age group is shown in Table (2).

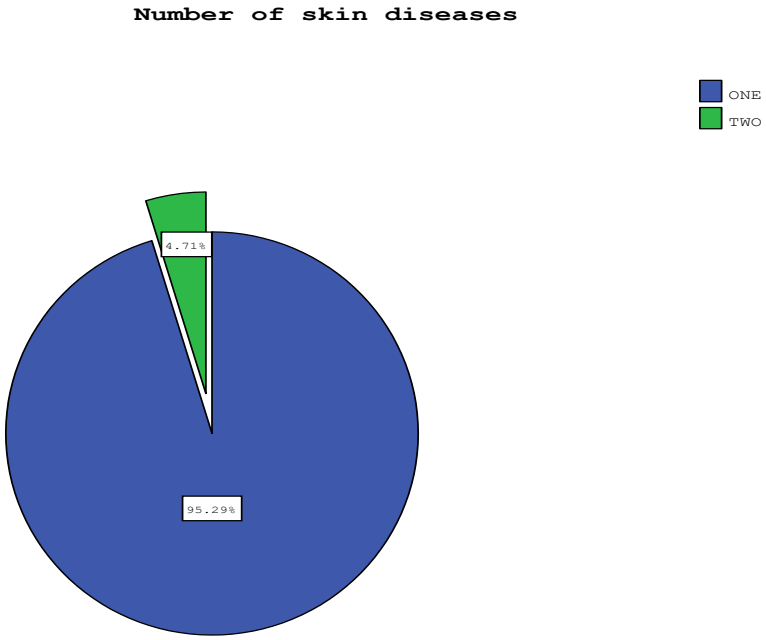

Fig.1 Number of Skin Diseases Among Pediatric Patients Attending Dermatology Department at Al-Gamhoria Teaching Hospital, Aden Yemen

Table 1: Demographic Characteristic of Pediatric Patients Attending Dermatology Department at Al-Gamhoria Teaching Hospital, Aden Yemen

Variables	Category	Frequency	Percent
Age of children	Infants (up to1 year) Toddler and preschool (>1-5 years) School age (6-10 years) Adolescent (1 1-14 years)	13 65 61 52	6.8 34.00 31.9 27.2
Sex			
	Male	108	56.5
	Female	83	43.5
Mean age ± Standard Deviation	7.10 ±4.098		

Table 2: The Pattern of Skin Diseases Regarding Child Age Diagnosed at Dermatology Department at AL-Gamhoria Hospital, Aden, Yemen

Pattern	Infants	Preschool age	School age	Adolescent	Total
Bacterial infection	5	16	11	6	38
Eczema	2	16	10	12	40
Fungal infection	1	7	17	8	33
Infestations	4	7	8	6	25
Viral infection	0	4	6	5	15
Urticaria & and related disorders	0	5	2	3	10
Pigmentary disorders	0	2	3	3	8
Disorders of sweat & sebaceous gland	1	1	1	5	8
Hair disorders	0	3	2	1	6
Miscellaneous	0	4	1	3	8

In the current study, maximum number (n = 65, 34.0 %) of patients were in the age group of > 1-5 years followed by age group of 6-10 years (n= 61, 31.9 %) and > 10 (11-14 years) (n=52,27.2 %), and infants were (n=13,6.8 %). Among infectious diseases, bacterial infections were predominated in childhood (1-5 years) than adolescence, while fungal infections occurred more frequently in school children (6-10 years). In our study, predominance of most of infectious diseases in males. Skin disorders showed a significant association with gender (P= 0. 042).

Table 3 Distribution of skin infections and infestations (n =111)

Classification	Frequency	Percent %
Bacterial infections	38	19.8
Impetigo	26	13.5
Furuncle	8	4.2
Cellulites	4	2.1
Folliculitis	1	0.5
Fungal infections	33	17.3
Tinea capitis	13	6.8
Pityriasis versicolor	9	4.7
Tinea coporis	6	3.1
Tinea faciei	2	1.00
Candidial intertigo	1	0.5
Paronychia	1	0.5
Tinea pedis	1	0.5
Infestations	25	13.1
Scabies	18	9.4
Pediculosis capitis	4	2.1
Protozoal infestation (leishmaniasis)	3	1.6
Viral infections	15	7.9
Verrucae vulgaris (viral wart)	8	4.2
Herpes zoster	3	1.6
Chickenpox	3	1.6
Viral exanthema	1	0.5

Eczema constituted 20.9 % of all patients, atopic dermatitis was the most common eczematous disorder observed in 22 patients (11.4 %) ,followed by pityriasis alba 4 (2.1 %) , contact dermatitis 8 (4.2 %), and photo dermatitis two cases (1%) , foot eczema, hand eczema , napkin dermatitis and nummular eczema were from one case(0.5%).Other non-infectious disorders, in descending order were hypersensitivity disorders, pigmentary disorders ,sweat & sebaceous glands disorders, and hair disorders 5.2%,4.2 %,4.2% ,and 3.1% respectively. Miscellaneous group in current study comprised two cases of nevoid, pityrasis rosea, lichen nitidus, hyperkeratosis, xeroderma, benign vascular disorder (infantile haemangioma), and chronic childhood bullous disease, each accounting one case (0.5 %) Table 4.

Table 4. Distribution of non- infectious skin diseases into specific group(n=80)

Dermatoses	Number	Percent
Eczemas	40	20.9
Atopic dermatitis	20	10.5
Pityriasis alba	6	3.1
Contact dermatitis	8	4.2
Photodermatitis	2	1
Napkin dermatitis	1	0.5
Nummular eczema	1	0.5
Foot eczema	1	0.5
Hand eczema	1	0.5
Hypersensitivity disorders	10	5.2
Urticaria	5	2.6
Papular urticaria	3	1.6
Pruritus	2	1.0
Pigmentary disorders	8	4.2
Post inflammatory hyper& hypopigmention	7	3.7
Vitiligo	1	0.5
Sweet & seb. gland disorders	8	4.2
Acne	5	2.6
Miliaria	3	1.6
Hair disorders	6	3.1
Alopecia	3	1.6
Hair fall	2	1.0
Uncombable hair syndrome	1	0.5
Miscellaneous	8	4.2

The total number of skin diseases diagnosed was greater than number of patients because 9(4.7%) had more than one skin disease.

DISCUSSION

The prevalence of pediatric skin diseases is very high, especially in developing countries. Unfortunately, the data of skin diseases patterns among children in Aden, Yemen are still lacking. This is the first study of skin diseases among children in, Aden, Yemen to the best of my knowledge except one also hospital-based study was previously carried but among general population Epidemiological data is important in planning public health policies for disease control and formulate therapy recommendations for common diseases in the area [11,12].

Like other literature, the author found that males were more prone to disease than females (55.5 vs.44.5 %). This is in agreement with studies by Yahya A in Nigeria and by kelbore et al. in Southern Ethiopia who reported males 51.2 % vs. 48.8 % females and 52.4 % vs.44.9 %. respectively [13,14]. Kandpal et al, also observed males' preponderance in their study [15]. However, different from others who detected females' preponderance in their studies [16,17,18]. This significant difference might be due to increased outdoor activities of male children as compared to female children. While an African study reported no gender predilection. [19]

In this study, maximum patients were in the age group 1> -5 years (34.0%) ,followed by age group of 6-10 years (31.9 %) and 11-14 years (27.2%), the least group < 1 years constitutes (6.8 %).Karthikeyan et al., reported maximum number of patients between age group 1-4 years and Verma et al., noted in the age group 1> -5 years similar to present study [20,21].The reason for involvement of children of this age group may be due to high vulnerability of children to infection because of low immunity and poor nutritional status [22].This may also be due to increased exposure of preschool and school going children to environmental factors.

The result also showed that most of patients 182 (95.3%) had one skin disease while the rest (9,4.7 %) had two skin diseases. This result conforms to most of the findings in other studies [23,17,24]. According to Katibi et al. [25]. The presence of multiple skin conditions in some individuals draws attention to the need for through skin assessment of children to avoid missed diagnoses.

In current study, the commonly encountered disease group was infections. This seems consistent to most of the findings in other studies from underdeveloped or developing countries like India (56.6%), Pakistan (45.1%), Nepal (24.6%), Nigeria (57.6%) [16,19,26,27].

The high frequency of infectious diseases may be explained by crowded environments, inadequate hygiene, and low socioeconomic level in underdeveloped or developing countries. In contrast, eczematous and inflammatory disorders predominate in western children. [28,29]. In South Yemen, also in community based, study the leading group of diseases followed by infections and infestations. While, in other hospital-based study, infections were predominated [30,31]. The differences may be due to differences in geographical location, sample size, duration of the study, study design, different patient age limits, and socio-economic status. In particular, the other studies were based on out-patient populations, which were different from our hospital-based one and this may explain some differences.

Among infectious conditions, bacterial infections were (19.9%) predominated, followed by fungal, parasitic, viral infections. This trend is consistent with studies by Verma et al., in India and Subramania et al. in North Chennai., who also recorded frequency of bacterial infections in 15.25%, and 44.18% cases , respectively [21, 32] In contrast, to finding of study done by Mukhtar et al. (Pakistan),

Al-Mendalawi and Ibrahim (Iraq) , and Gashaw et al.(Ethiopa) [19,33,23] who reported fungal disorders predominated, crowded environments, inadequate hygiene, and low socioeconomic level in underdeveloped or developing countries.

The pattern of skin disease varies in each region due to differences genetics, and environmental factors [14]. Bacterial infections were most common infection in patients aged 1-5 years, whereas fungal infections were more common in children aged 6-10 years. Among bacterial infection, impetigo was the commonest skin disorder 26 (13.6 %) observed in children in this study. Similarly in all studies found impetigo as the most common pyoderma [14,19,34,35]. Contra tray, to Red et al. [36] who revealed that furunculosis was the most common, amounting to 38 (8%) cases followed by impetigo. The observed finding in this study may be related to ease of spread of infection from direct contact with the secretions obtained from broken skin of the infected area to another site. it has been suggested that low socioeconomic status, favorable tropical weather, neglected and poor hygiene, overcrowding, and inadequate nutrition may account for high incidence of this disorders. Fungal infections of the skin were the second most common infection in our study, seen in 33% of children. Similar Gupta.[37] demonstrated that fungal infections of the skin were the second most common infection in his study, which seen in 28% of children.

Among fungal disorders (5.8%) tenia capitis (6.8 %) was the most common type of dermtophyte infection. This finding is similar to that reported in two studies in Nigeria with rate of 8.1%, and 15.1 % respectively [17,13]. Fungal skin infections flourish in areas of high humidity, poor personal hygiene and sanitation. As such there is need to strengthen health education, personal hygiene and sanitation patricianly caregivers of young children to control the spread of infection which is known to occur in epidemics in schools. [38,39] Scabies is ranked first etiological cause of parasitic infections in children with total cases of patients 18(8.9%), followed pediculosis capitis. A similar trend reported by kelabore (Ethiopia), and Kiprono et al. (Tanzania) who also recorded a maximum frequency of scabies infection in 9.6% and 7.4 % cases respectively. [14,40]. The incidence of scabies was low when compared to observations by Prakoeswa et al. in (Indonesia) and Verma et al. in (India) who reported a rate of 27.1%, and 24.12% respectively [41,21], however, several authors have reported a much lower prevalence, ranging from 1.2% to 1.6%. [27,17]. The variation of scabies infestation rate may be due to different factors such as family size, personal hygiene, and economic conditions. [42,43] Pediculosis capitis was noted in four patients (2%). Similarly, in Addis Ababa, Ethiopia Gashaw et al. [23] reported a rate of (1.6 %) ,In rural India study pediculosis constituted (0.7%) [21].The lower incidence in this study and other study may be due to knowledge and availability of over the counter products for lice removal. Our study also reported a few emerging neglected tropical diseases such as cutaneous leishmaniasis which constituted three cases (1.6%). Low incidence (0.6 %) also reported in Addis Ababa, Ethiopia by Gashaw et al. [23]. Verruca (common wart) was the most frequent viral infections (8,4.2%). This Finding is an agreement with [27,28,35]. Varicella and herpes zoster was in the second rank of viral infection similarly Podder et al., and Bonthu etal.[16,34] documented that varicella was the second in rank of dermatoses.

The second largest group of dermatological conditions were eczema (20.9%). Reddy BR and Narasimha Rao and, Ayanlowo et al. also observed eczema as a second most prevalent dermatoses [44,17]. In India, Verma et al .and Pawar S et al. in two studies among pediatric patients also reported eczema as second most prevalent dermatoses with a rate of 20.24 % and 17.34% respectively [21,45]. Among dermatitis the family atopic dermatitis was the commonest was the commonest eczema

(11.4%) in this study, with a majority of cases observed among boys between age group >1-5 years. This is in similar to the findings by Kam et al. [46] in China who reported eczema to be the commonest skin disorder accounting for 33% of skin disorders observed in children and was found to be more common in boys, with majority observed in age group (1-5 years). However, Mukhtar et al. showed predominance of infantile seborrhoeic dermatitis as most of their patients aged < 4 years, leading to higher proportion of infantile seborrhoeic dermatitis [19]. Incidence of eczematous conditions is dependent on environmental conditions and individual genetic predisposition, thus explaining the variable frequency. In developed countries, a significant increase in the prevalence of atopic dermatitis has been observed over the last decades, possible due to small family size, increased income and education, better socioeconomic status, improvement in sanitation, increased use of antibiotics, and the so-called "Western lifestyle" as well as earlier diagnosis. On the contrary, in developing countries, infections and infestations remain the most prevalent skin disease in the pediatric population, whereas AD is a rather rare entity [47].

Hypersensitivity disorders constitutes (5.2 %) of all cases, urticaria 2.6 % was our most common hypersensitivity disorders. This finding is consistent with xiao et al., who reported urticaria in 2.7% and Aassefa et al. who reported a rate of 3.1% .[48,49] However, the figure is lower than noted in Pakistani 10 % [10].The low figure in our study may be due to like hood of most the patients to present to the emergency and medical OPD rather than the skin clinic. Papular urticaria (insect bite reaction) accounting for 1.6 % of all cases. Similarly, Saini et al. [35] recoded a rate of 1.1%. Papular urticaria affect children predominately resulting from exaggerated response to insect bites and stings in the tropics when insect population is increased.

Pigmentary disorders which included vitiligo, and post inflammatory hyper & hypopigmention constituted (4.2 %) of the total patients. Vitiligo was diagnosed in one case (0.5%) of study population. Ozcelik et al. in Turkey recorded rates of 0.74% and other authors in Indian study reported a rate of 2.09% and 0.7 % respectively. [50, 16,51,]. The figure is lower than reported by Reddy BR and Narasimha Rao in India, by Oninla et al. in Nigeria, and Irlis et al. in Greece who reported a frequency of 4.9 %, 5.3%, 7.6%. respectively [44,27,52]. Deviate from Kandpalr et al. [15] who showed that all cases were vitiligo.

Disorders of sweat and sebaceous gland constituted (4.2%). Acne is a common skin disease that affects pilosebaceous follicles mainly among adolescents. In current study, acne was found in 2.6 % of cases. This observation correlates well with study by Verema et al (India) who reported acne in 3.29%.[21] on contrast, to studies in Ethiopia acne constituted 1.3 %, and 1.1 % respectively. [23, 15]. Hussain et al .in in Jeddah, Saudi Arabia. study reported that acne is the second most common skin disease [53].

Milliara constituted (1.6%). Similarly, a rate of 1.9 % reported by Verma et al. in India [21].

Hair disorders constituted (3.1%), alopecia areata (1.6%) was the most common hair disorder. This was similar to study done by Pawar et al. [45], where alopecia areata was the commonest hair disorder.

Miscellaneous skin disorders constituted (4.2%) which included disorders of, Papulosquamous disorders, keratinization disorders, nevoid disorders, bullous disease, and benign vascular tumor (Infantile haemangioma).

Papulosquamous was seen in (1.0%) of the total cases, one case lichen nitudus (0.5%) and one pityriasis rosaea (0.5%), no case of psoriasis has been detected. Bonthu et al. [34] reported lichenoid disorders as most common papulo-squamous dermatoses (0.8 %). Our study corroborates the fact that psoriasis is less common in tropics and dark

–skinned individuals [27]. Contrary to Saini etal. and Ozcelic etal. [35, 50] who noted psoriasis to be the most frequent in their cohorts.

Disorders of keratinization included two cases of hyperkeratosis (1%). This finding was similar to Saini et al. [35] who reported a prevalence of 1.7%.

The nevoid disorder also account for 1% of the cases. This finding similar to study done by Sattar et.al. where the prevalence was 0.75%**.** [54]

In vesiculobullous disorders a single case of chronic bullous disease of childhood was seen in (0.5 %,). This was similarly to study done by Reddy et al. [36]. Limitations. This study was conducted in a single hospital with small sample size, so the results may not reflect the true estimate of the whole country.

CONCLUSION

The dermatoses such as infections and eczema are very common in the pediatric age group with bacterial infections being the most common infections followed by fungal infections Preschool, and school age group is the most vulnerable group for skin-related diseases among children. Predominance of infectious diseases in males.

Declaration by authors

Ethical Approval: Approved

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