

Patterns of Skin Diseases among Pediatric Patients Attending the Pediatric Dermatological Clinic at King Hussein Medical Center

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ABSTRACT

Objectives: This study was conducted to determine and highlight the spectrum and patterns of skin diseases among pediatric patients attending the pediatric dermatological clinic at King Hussein Medical Center and Queen Rania Abdullah Hospital for Children.

Methods: All newly diagnosed pediatric patients who presented to the outpatient clinic of pediatric dermatology clinics between February 2008 and March 2013 were included in the study. Inclusion criteria included patients with skin disease below the age of 15 years. Patients were divided into three age groups: infant, preschool and school age children. Skin diagnosis was made clinically and laboratory investigations were ordered when necessary. Descriptive statistical analysis was used to describe the study variables.

Results: A total of 5,004 patients were included in the study. Some subjects had more than one disorder. The age ranged from one day to 15 years with a mean of 8.6 ± 7.4 years. There were 2,577 males (51.5%) and 2,427 (48.5%) females, with a male to female ration of 1.1:1. Preschool children were more frequently affected than other children. Analysis of underlying etiologies revealed that the majority of dermatoses were infections and infestations (35.3%), followed by eczema (30.1%) and hypersensitivity reaction (6.5%).

Conclusions: Skin diseases are common in children especially the preschool age group with no significant difference between genders. The most common skin disease in this study was cutaneous infections followed by eczema. Higher consanguinity, overcrowding and hot humid environment may explain the high prevalence of infections.

Key words: Dermatology, Eczema, Hypersensitivity, Infestation, Pediatric, Skin disorders.

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Introduction

Irrespective of age, the patterns of skin diseases are influenced by many factors such as family size, socioeconomic class, overcrowding, personal hygiene, nutritional status, educational background, family history, and traditional

taboos.⁽¹⁻¹²⁾ The pattern of skin disease shows seasonal variations and varies from one country to another and even within different geographical regions of the same country.^(1,4,7-8,10-12)

The incidence of skin disorders in children ranges from 9% to 34% and almost one third of

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visits to pediatric clinics are due to skin problems. This work load makes the role of pediatricians important in the evaluation of skin diseases and urges them to know about the patterns of skin diseases as the spectrum of skin diseases may also change with time.^(3,4,7,11,12-13) In spite of the role of the pediatrician in the management of skin diseases the pediatric age group constitutes 30% of the dermatologist's work load.^(1,3,5,9,12,14)

The aim of this study was to review pediatric skin disorders seen in children who attended outpatient dermatology clinics at King Hussein Medical Center and Queen Rania Abdullah Hospital for Children in Jordan. There are no previous studies regarding the patterns of skin disorders among children in Jordan.

Methods

All newly diagnosed pediatric patients who presented to the outpatient clinic of pediatric dermatology clinics at King Hussein Medical Center and Queen Rania Abdullah Children's Hospital between February 2008 and March 2013 were included in the study. Local ethical committee of the Royal Medical Services approved the study.

Inclusion criteria included patients with skin disease below the age of 15 years. Skin diagnosis was made clinically and laboratory investigations were ordered when necessary, which includes complete blood count (CBC) with differential count, urinalysis, liver function test and renal function test, as well as skin scraping for fungal infections and skin biopsy for histopathological diagnosis. Patients were divided into three groups according to age: group A (infant), below one year of age, group B (preschool), 1-6 years of age, and group C (school age), between 6 and 15 years of age. Descriptive statistical analyses (mean, frequency, and percentage) were used to describe the study variables.

Results

Of the 5,004 patients, 2,577(51.5%) were males and 2,427(48.5%) were females, with a male to female ratio of 1.1:1. The age ranged from one day to 15 years with a mean of 8.6 ± 7.4 years.

Table I shows the distribution of children with skin disorders according to age and sex and

reveals that group B (preschool) are more frequently affected (40.2%) and males slightly outnumber the females (51.3% vs. 48.7%, respectively).

The commonest skin diseases encountered were infections and infestations (35.3%) followed by eczematous skin diseases (30.1%) and the least was hair disorders (Table II).

Tables III, V, and VI show the different infections and infestations according to age groups and revealed that bacterial infection (10.4%) to be the most common entity followed by viral infections (10.2%), fungal infections (9.5%), and parasitic infestation (5.2%). Impetigo was the commonest bacterial infection (6.4%) followed by secondary pyoderma (1.7%). Warts were the most common viral infection (5.2%) followed by molluscum contagiosum (1.5%). Tinea capitis was the most common fungal infection (5.8%), and Pityriasis versicolor (0.2%) was least common. Of the infestation group, scabies was the most common, whereas leishmaniasis (0.4%) was least common.

Of the eczematous disorders, atopic dermatitis was the most frequently encountered (12.1%) and Pompholyx (0.1%) was the least (Table VII). Insect bite was the commonest hypersensitivity disorder (3.8%) followed by urticaria (1.7%) (Table VIII). Papulosquamous and keratinization disorders constituted 6.1% of all skin diseases with psoriasis (1.9%) and ichthyosis (1.7%) being the most common (Table IX).

Pigmentary disorders were seen in 269 patients (5.3%), of which vitiligo (4.1%) was the most common, followed by post inflammatory hypopigmentation (0.5%) and hyperpigmentation (0.4%) respectively (Table X). Alopecia areata was the most common hair disorder (2.5%), followed by trichotillomania (0.3%) (Table XI).

Vascular disorders were seen in 183 children (3.6%) and hemangioma (1.7%) was the most common, followed by salmon patches (1.6%) and vasculitis (0.2%) respectively (Table XII).

Neonatal disorders were seen in 311 (6.1%) patients of which erythema toxicum neonatorum (3.0%) was the most common, followed by transient pustular melanosis (2.2%) (Table XIII).

Miscellaneous disorders formed (4.1%) of all skin disorders (Table XIV); with acrodermatitis enteropathica (0.7%) being the most common.

Table I: Distribution of children with skin disorders according to age and sex

Gender	Age distribution			Total
	Group A: <1year	Group B:1-6 years	Group C: 6-15 years	
Males	754	1032	791	2577(51.5%)
Females	775	978	674	2427(48.5%)
Total	1529	2010	1465	5004(100%)

Table II: The most common disease in the study population (n=5096)

Condition	Age distribution			Total
	Group A < 1 year	Group B, 1-6 years	Group C, 6-15 years	
Infections and infestations	160	1004	634	1798(35.3%)
Eczematous	729	463	340	1532(30.1%)
Hypersensitivity	85	177	67	329(6.5%)
Pigmentary	16	118	135	269(5.3%)
Papulosquamous and keratinization	16	145	149	310(6.1%)
Vascular lesion and vasculitis	159	17	7	183(3.6%)
Hair disorder	5	73	79	157(3.1%)
Neonatal	311			311(6.1%)
Miscellaneous	67	127	13	207(4.1%)
Total	1548	2124	1424	5096(100%)

Table III: Different bacterial infection (n=531).

Condition	Age distribution			Total
	Group A < 1 year	Group B, 1-6 years	Group C, 6-15 years	
Impetigo	50	225	53	328(6.4%)
Secondary pyoderma	---	40	48	88(1.7%)
Folliculitis	---	58	11	69(1.4%)
Furuncle and carbuncle	---	9	22	31(0.6%)
Paronychia	---	5	6	11(0.2%)
Scrofuloderma	---	2	2	4(0.1%)
Total	50	339	142	531(10.4%)

Table IV: Viral infection (n=520)

Condition	Age distribution			Total
	Group A < 1 year	Group B, 1-6 years	Group C, 6-15 years	
Warts	---	125	142	267(5.2%)
Molluscum contagiosum	5	49	20	74(1.5%)
Chickenpox	5	40	20	65(1.3%)
Herpes simplex	---	40	14	54(1.1%)
Herpes zoster	---	5	10	15(0.3%)
Roseola infantum	30	5	---	35(0.5%)
Others	10	---	---	10(0.2%)
Total	50	264	206	520(10.2%)

Table V: Fungal infection (n=482)

Condition	Age distribution			Total
	Group A < 1year	Group B, 1-6 years	Group C, 6-15 years	
Tinea capitates	---	210	169	379(5.8%)
Tinea facia	---	25	15	40(0.8%)
Tinea corporis	---	5	9	14(0.3%)
Candidaiasis	30	8	---	38(0.7%)
Pityriasis versicolor	---	3	8	11(0.2%)
Total	30	251	201	482(9.5%)

Table VI: Parasitic diseases (n=265)

Condition	Age distribution			Total
	Group A < 1 year	Group B, 1-6 years	Group C, 6-15 years	
Scabies	23	115	25	163(3.2%)
Pediculosis	7	25	48	80(1.6%)
Leishmaniasis	---	10	12	22(0.4%)
Total	30	150	85	265(5.2%)

Table VII: Different types of eczema (n=1532)

Condition	Age distribution			Total
	Group A < 1 year	Group B, 1-6 years	Group C, 6-15 years	
Atopic dermatitis	274	209	136	619(12.1%)
Napkin dermatitis	308	50	---	358(7.0%)
Pityriasis alba	---	140	175	315(6.2%)
Seborrhoeic dermatitis	142	20	---	162(3.2%)
Contact dermatitis	5	20	---	25(0.5%)
Photo dermatitis	---	9	10	19(0.5%)
Nummular eczema	---	10	10	20(0.5%)
Pompholyx	---	---	4	4(0.1%)
Others	---	5	5	10(0.2%)
Total	729	463	340	1532(30.1%)

Table VIII: Hypersensitivity disorder (n= 329)

Condition	Age distribution			Total
	Group A <1year	Group B, 1-6 years	Group C, 6-15 years	
Insect bite(reaction)	50	115	30	195(3.8%)
Urticaria	20	45	20	85(1.7%)
Drug induced reaction	15	10	15	40(0.8%)
Others	---	7	2	9(0.1%)
Total	85	177	67	329(6.5%)

Table IX: Papulosquamous / keratinization disorder (n=310)

Condition	Age distribution			Total
	Group A < 1 year	Group B, 1-6 years	Group C, 6-15 years	
Psoriasis	5	47	46	98(1.9%)
Ichthyosis	5	50	32	87(1.7%)
Keratosis pillars	3	30	41	74(1.5%)
Pityriasis rosea	---	10	19	29(0.6%)
Lichen planus	---	3	7	10(0.2%)
Other	3	5	4	12(0.2%)
Total	16	145	149	310(6.1%)

Table X: Disorder of pigmentation (n=269)

Condition	Age distribution			Total
	Group A < 1 year	Group B, 1-6 years	Group C, 6-15 years	
Vitiligo	10	94	105	209(4.1%)
Post inflammatory hypopigmentation	3	10	15	28(0.5%)
Post inflammatory hyperpigmentation	2	10	10	22(0.4%)
Others	1	4	5	10(0.2%)
Total	16	118	135	269(5.3%)

Table XI: Hair disorders (n=157)

Condition	Age distribution			Total
	Group A < 1 year	Group B, 1-6 years	Group C, 6-15 years	
Alopecia areata	---	54	72	126(2.5%)
Trichotillomania	---	11	5	16(0.3%)
Others	5	8	2	15(0.3%)
Total	5	73	79	157(3.1%)

Table XII: Vascular and Vasculitis (n=183)

Condition	Age distribution			Total
	Group A < 1 year	Group B, 1-6 years	Group C, 6-15 years	
Hemangioma	85	---	---	85(1.7%)
Salmon patches	71	9	---	80(1.6%)
Vasculitis	---	3	7	10(0.2%)
Others	3	5	---	8(0.2%)
Total	159	17	7	183(3.6%)

Table XIII: Neonatal disorders (n=261)

Condition	Age distribution			Total
	Group A < 1 year	Group B, 1-6 years	Group C, 6-15 years	
Erythema Toxicum Neonatorum	152	---	---	152(3.0%)
Transient pustular melanosis	114	----	----	114(2.2%)
Miliaria	25	---	---	25(0.5%)
Colloidon baby	10	----	---	10(0.2%)
Other	10	---	---	10(0.2%)
Total	311	---	---	311(6.1%)

Table XIV: Miscellaneous disorder (n=207)

Condition	Age distribution			Total
	Group A < 1 year	Group B, 1-6 years	Group C, 6-15 years	
Nevus depigmentosus	11	12	---	23(0.5%)
Congenital melanocytic nevi	10	---	---	10(0.2%)
Linear epidermal nevi	7	13	---	20(0.4%)
Tuberous sclerosis	5	8	3	16(0.3%)
Neurofibromatosis	3	8	2	13(0.2%)
Xeroderma pigmentosa	2	3	---	5(0.1%)
Acrodermatitis enteropathica	8	27	---	35(0.7%)
Morphea	2	25	2	29(0.6%)
Lichen sclerosis	----	6	3	9(0.2%)
Epidermolysis bullosa	10	----	----	10(0.2%)
Other	9	25	3	37(0.7%)
Total	67	127	13	207(4.1%)

The most common nevoid disorder was nevus depigmentosus (0.5%) followed by linear epidermal nevi (0.4%). Of genodermatoses the most common was tuberous sclerosis followed by neurofibromatosis.

Napkin dermatitis (6.0%) was the most common skin disorder affecting infants (Group A), impetigo was the commonest to affect preschool children (4.4%) (Group B), and Pityriasis Alba

was the commonest to affect the school age group (3.4%) (Group C).

Discussion

Pediatric skin disorders are important health problems as they constitute about 20-30% of children seen by pediatricians.^(1,3,5,9,12,15) Although children are commonly seen in various dermatology clinics, there are no published

studies from Jordan that handle the epidemiology of skin condition among children in Jordan. Such studies are important for improvement of treatment facilities as well as pharmaceutical industries and health planning.^(1,3,5,11-12,16-17)

The pattern of pediatric skin problems worldwide has varied from one study to another, affected by many factors as mentioned above. In our study, the majority of patients had infections and infestations (35.3%) followed by eczemas (30.1%) and hypersensitivity (6.5%) and these frequencies are similar to previously reported studies.^(1-4,6-9, 7-20)

In the infection and infestation group, the most common were bacterial infections (10.4%), viral (10.2%), and fungal (9.5%) infections, respectively. This is in line with similar studies,^(1,2,4,5,20) although other studies reported inconsistent frequencies: some studies reported fungal infection to be more common than viral infections,^(1-4,6,7,9,10,20) or that viral infections more common than bacterial and fungal infections.^(1,5,15,20)

Impetigo was the most common bacterial infection (6.4%) in our study and most frequently seen in summer season and this is in accordance with many similar studies.⁽¹⁻⁶⁾ Several factors may explain the high prevalence of infections in our study, these may include hot climate, overcrowded families, low socioeconomic status and widespread use of topical and systemic antibiotics.

In our study, warts were the commonest viral infection followed by molluscum contagiosum and this is in agreement with several other studies.^(3,4,14-15,18-20) Although other studies reported higher prevalence of molluscum contagiosum.^(1,9,12)

Different findings were reported in the literature in regards to fungal infections. Whereas tinea capitis was reported to be the most common fungal infection followed by tinea corporis by some authors, others reported candidiasis to be the second commonest fungal infection in children.^(4,5) In our study tinea capitis was also the most frequent fungal infection (7.4%),^(1-2,4-6,17-18) and these differences could be due to the variation in fungal species prevalence in different areas.

Scabies was the most common infestation seen in patient in our study (3.2%), followed by

pediculosis (1.6%) and leishmaniasis (0.4%) respectively. In some studies, scabies was most common.^(1-6,8,17-18) However, in other studies pediculosis was the most frequent parasitic disease followed by scabies.^(2,8,17,18) The high rates of scabies in our study could be due to larger size of families, crowded nurseries and school classes. Pediculosis cases are more frequent in school- aged children where crowded classrooms could be a factor facilitating transmission of the parasite.

Atopic dermatitis (12.1%) was the commonest eczematous disease in our study followed by napkin dermatitis (7.0%), pityriasis alba (6.2%), and seborrheic dermatitis (3.2%) respectively, and this agrees with another reported study.⁽⁵⁾ Although the second most frequent eczematous disease differs in most of the previous studies but the majority of them agrees that atopic dermatitis is the commonest.^(1,4) However, some studies recorded higher prevalence of pityriasis alba compared to atopic dermatitis.^(2,8,16,18) There is a considerable variation in the prevalence of atopic dermatitis in various studies due to design of study, racial variations, diet, customs and habits, constitution, environmental and other factors. The reason for this increase in the prevalence of atopic dermatitis is still unknown but may be due to changes in environment pollutants in addition to shift from breast feeding to bottle feeding. In our study, these dermatoses (atopic dermatitis and pityriasis alba) were noted more in winter and this was in agreement with other studies.⁽¹⁾

Insect bite reaction was the commonest hypersensitivity reaction (3.8%) followed by urticaria (1.7%). This was similar to other studies.^(1-3,5,9,12,16,19) However; in some studies urticaria has been reported to be more common than insect bite reaction.^(4,7) In our study, insect bite reactions were noted mainly during spring and summer months where insects are more active in warm weather.

Although few studies reported higher prevalence of post inflammatory hypo- and hyperpigmentation compared to vitiligo,^(1,2,9) other studies agree with our findings where vitiligo was the most common (4.1%), followed by post inflammatory hypopigmentation (0.5%) and post inflammatory hyperpigmentation (0.4%) respectively.⁽³⁾ The high rate of vitiligo may be related to higher consanguinity rate seen in the

Jordanian community.

Psoriasis (1.9%) and ichthyosis (1.7%) were the most common papulosquamous and keratinization disorders followed by pityriasis rosea (0.6%) and keratosis pilaris (1.5%) and this is in accordance with most of other studies.^(2-5,9,12,15,18,20)

Vascular disorders were seen in 183 patients (3.6%). Hemangioma was the most common (1.7%), followed by salmon patches (1.6%). Although this finding was in agreement with most of previous studies,^(1-4,14,16) but others found salmon patches to be the most common.^(5,12) The relatively high frequency of vascular disorders observed in our study may be explained in part by the nature of the clinic setup in a specialized referral center receiving cases from other hospitals.

As for hair disorders, alopecia areata was most common (2.5%), followed by trichotillomania (0.3%). Only one study recorded higher prevalence of trichotillomania compared to alopecia areata.⁽³⁾

In our study, a high frequency of neonatal disorders were observed in comparison with other studies⁽⁴⁾ where a low frequency of neonatal disorders were seen.⁽⁴⁾ The high prevalence in our study may be in part due to the conduction of our study in a highly specialized neonatal department, with large neonatal intensive care unit, bone marrow transplant unit, and the fact that it serves as a tertiary referral center to neonates from other local hospitals.

Among the miscellaneous disorders, acrodermatitis enteropathica was the most common (0.7%), followed by morphea (0.6%), epidermolysis bullosa (0.2%), and lichen sclerosus (0.2%). Genetic disorders were observed in low frequency in our study and this agrees with other studies,^(2,4-6,16) but disagrees with others where a high frequency of genetic disorders was observed in other parts of the world.^(9,12,14,18-19) The most common genetic disorder in our study was tuberous sclerosis followed by neurofibromatosis and xeroderma pigmentosa respectively. The high frequency of genetic disorders in this study population may be explained in part by the increased rate of consanguineous marriages among rural population. Low frequency of nevi was observed in our study and similar results were reported by

others.^(1-4,6) In contrast, high frequency of nevi was observed in other studies.^(5,12,14,16,18) In our study, nevus depigmentosus was the most common followed by linear epidermal nevus and congenital melanocytic nevi, respectively.

Conclusion

Skin diseases are common in children especially the preschool age group with no significant difference between genders. The most common skin diseases in this study were cutaneous infections followed by eczema. Higher consanguinity, overcrowding and hot humid environment may explain the high prevalence of infections. These local data may be useful in health care planning for children to improve the quality of management and prevention of skin disorders.

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