

Prevalence of skin disorders among primary school children in Diyarbakir, Turkey

Bilal Sula M.D.^a, Derya Uçmak M.D.^a, Günay Saka M.D.^b, Sedat Akdeniz M.D.^a, Engin Yavuz M.D.^a, Yunus Yakut M.D.^a, Evrim Arslan M.D.^b, Hamza Aktaş M.D.^a, Mehmet Yıldız M.D.^b, Sibel Yolbir M.D.^a, and Ruken Azizoglu M.D.^a

ABSTRACT

Background. The purpose of this study was to determine the prevalence of childhood dermatoses in Diyarbakir, which is located in the southeastern region of Turkey.

Material and Method. This cross-sectional study was carried out in April 2008 among students of eight randomly selected public primary schools in Diyarbakir. Students were examined and questionnaire was applied to determine socio-economic levels and socio-demographic features.

Results. A total of 1932 students were examined by dermatologists. Nine hundred and fifty three (49.32%) girls, mean age was 11.06±2.13 (range 6-17). The overall point prevalence of skin disorders was 59.1%. Among this sample 776 children (40.2%) had only one skin disease whereas 299 (15.5%) had two and 67 (3.5%) had at least three. The point prevalence of skin disorders was 33.1% among students in grade 1 and 78.9% among students in grade 8 (p<0.05). The most common skin disease was eczema (32.8%), followed by pigmentation disorders (17.2%), skin infections (13.4%), scalp disorders (10.1%) and acne vulgaris (9.6%). Infectious skin problems, pigmentation disorders, hair and scalp disorders and acne vulgaris were more common among girls compared to boys (p<0.05). In addition, infectious skin problems were more common among boarders (p<0.05) compared to day students.

Conclusion. Skin disorders affected 59.1% of the studied children. Skin disorders were more common among girls and boarders in this study, this group of children should be given specific attention in formulating preventive measures.

Keywords: prevalence, children, skin disorders.

<http://dx.doi.org/10.5546/aap.2014.eng.434>

INTRODUCTION

Epidemiologic research is necessary for determination of the prevalence of disorders, provision of protective health services and collection of data about age and sex differences between affected groups as well as their regional distribution. The prevalence of childhood dermatoses varies according to the ethnical background, generational differences, socio-economic status, environmental factors and study design. Such factors

as developmental status of a country, geographical characteristics of a region, socio-economic and socio-cultural status of people (family income, health insurance, housing, number of siblings, educational status of parents), number of subjects included in a study, patients presenting to various clinical departments for similar complaints (paediatrics, family medicine, dermatology, etc.) may impact on the prevalence and diversity of disorders found in a study population.

The exact determination of the prevalence of childhood dermatoses can only be achieved by extensive population-based studies. Several studies reported a high prevalence of skin disorders among school children in developing countries, the pattern of which varied considerably.¹⁻³ Although skin disorders are common among children in Turkey, there are only a limited number of studies investigating the prevalence of skin disorders among these children and studies are usually restricted to certain regions. In a retrospective study, reported that the most common skin disorders were allergic disorders (17.9%), followed by viral skin disorders (15.8%) among children under the age of 17 who presented to outpatient clinics of dermatology.⁴

In another study reported that skin complaints accounted for 3.9% of all hospital admissions and 3.7% of all admissions to community health centres.⁵ In studies of developed countries, it was reported that 6-24% of all patients presenting to outpatient clinics of paediatrics had skin-related complaints.⁶ Our aim was determine the prevalence of skin disorders among school children as well as the relation between skin disorders and

- a. Department of Dermatology.
- b. Dicle University, Department of Public Health, Faculty of Medicine, Diyarbakir, Turkey.

E-mail Address:
Bilal Sula M.D.:
bulentsula@hotmail.com

Conflict of Interest:
None.

Received: 1-15-2014
Accepted: 5-29-2014

demographic parameters for planning and provision of protective health services.

MATERIAL AND METHODS

This cross-sectional study was carried out in 2008 among students of eight randomly selected public primary schools in city centre of Diyarbakir. A list of all public and private primary schools was obtained from the national education directorate. In addition, students were administered a questionnaire for determination of their socioeconomic levels and socio-demographic features.

Local Ethics Committee's approval was obtained prior to the study. Furthermore, provincial directorate of national education, principals and teachers gave their consent to the study. Parents and guardians of children, who were provided information about the study, signed an informed consent form and children gave their oral consent to the study. An interviewer administered questionnaire was used to collect data on family size, type of housing and presence of pets at home. Then, children were interviewed individually in a private room. Examinations were performed by six dermatologists.

Diagnosis of dermatoses were performed mainly clinically by the consulting dermatologists. The diagnosis of atopic dermatitis was based on historical features, morphology and distribution of skin lesions, and associated clinical signs described by Hanifin-Rajka. The diagnosis of atopic dermatitis was established with three or more major features plus three or more minor features. The major features included pruritus, typical morphology and distribution of dermatitis, chronic or chronically relapsing dermatitis and personal or family history of atopy (asthma, allergic rhinoconjunctivitis, atopic dermatitis). Minor features included xerosis, cheilitis, infraorbital folds, facial pallor, keratosis pilaris, and pityriasis alba, etc.^{7,8} All children were asked questions about any skin problems they might have experienced and subsequently all were examined by dermatologists, regardless of their answers. Data on age, sex and dermatoses were collected.

Children were referred to a specialized centre wherever required, and parents and guardians of children were notified of any serious or infectious skin disorders their children had. For the other children, appropriate treatment was prescribed at the time of examination. Chi-squared and logistic regression analysis were

used to determine associations for categorical variables. P values below 0.05 were considered as statistical significant. Analysis was done using the Statistical Package for Social Sciences (SPSS) version 11.0, Epi Info 2000.

RESULTS

Diyarbakir is one of the largest cities in southeastern Turkey and its population is 1 607 437. Generally socioeconomic conditions of this geographical area is lower than other regions.⁹ The number of students studying at the center of Diyarbakir were 185 823 according to the provincial directorate for national education. Although 3000 students were planned to be recruited for the study, a total of 1932 students were finally included due to students absences.

Nine hundred and fifty three included students (49.32%) were girls. Age range was from 6 to 17 years, with a median age of 11.00. The overall point prevalence of skin disorders was 59.1%. Of those children, 776 (40.2%) had only one skin disease whereas 299 (15.5%) had two and 67 (3.5%) had at least three. The point prevalence of skin disorders was 33.1% among students in grade 1 (7 years old) and 78.9% among students in grade 8 (15 years old) ($p < 0.05$). Eczema was the most common skin disease in this study (32.8%), followed by pigmentation disorders (17.2%), skin infections (13.4%), scalp disorders (10.1%) and acne vulgaris (9.6%). In addition, pityriasis alba (18.3%) was the most common skin disease, followed by acne vulgaris (9.6%), pityriasis simplex (9.1%), ephelides (8.1%), xeroderma (6.8%) and warts (6.6%) (Table 1 and 2). Pityriasis was the most common form of eczema which occurred in 18.3% of all children, followed by xeroderma and atopic dermatitis. Among skin infections, viral skin disorders were the most

TABLE 1. Prevalence of skin infections in primary school children

Skin infections (n:258 – 13.4%)	n	(%)
Parasitic	59	3.05
Pediculosis capitis	39	2.0
Fungal	10	0.5
Bacterial	14	0.7
Viral	182	9.4
Warts	127	6.6
Herpes simplex	48	2.5

common ones (particularly warts), followed by parasitic skin infections (particularly pediculosis capitis). Skin infections, pigmentation disorders, pityriasis simplex and acne vulgaris were more common among girls compared to boys. On the other hand, eczemas were more common among boys compared to girls ($p < 0.05$) (Table 3). Risk estimates for infective skin disorders (ISD) and non infective skin disorders (NISD) categories in children, calculated by means of logistic regression analysis. ISD were almost three times higher among pensioners compared to day students ($p < 0.05$) (Adjusted OR 2.99, 95% CI: 1.81-4.93). There was no relation between infective skin disorders and grades, crowded index, educational and working status of mother and

pet ownership. In NISD, there was a significant relation between non-infective skin disorders, sex and grades. NISD were 1.44 times higher among girls compared to boys ($p < 0.05$) (Adjusted OR 1.44, 95% CI: 1.19-1.75).

Non-infective and parasitic skin disorders were 12.91 times higher among students in grade 8 compared to students in grade 1 (Adjusted OR 12.91, 95% CI: 6.82 – 24.44).

DISCUSSION

The prevalence and diversity of skin disorders among children may vary from one country to another. There are only a limited number of studies in the literature investigating the prevalence of these disorders among children. There are a few studies conducted in Turkey which mainly focus on a single skin disease rather than skin disorders as a whole.

Saçar et al. performed a study in Izmir and reported that eczema, which was detected in 26% of study population, was the most common skin disease among children under the age of 13. Other common disorders were infectious dermatoses (20.6%), erythematous squamous disorders (9.9%), xerosis (7.8%) and pigmentation disorders (6.7%) (10). Tamer et al. performed another study in Ankara and reported that acne vulgaris, which was detected in 12.4% of the study population, was the most common skin disease among children, followed by atopic dermatitis (11.8%), contact dermatitis (11.3%), warts (9.5%) and impetigo (4%).¹¹ Inanir et al. reported the following common skin disorders among children in Manisa: melanocytic nevi (14.4%), keratosis pilaris (12.5%), pityriasis alba (12%), xerosis (11.8%), pediculosis capitis (9.4%) and atopic dermatitis (6.8%).¹

In their study of a total of 4839 school children in Ghana, Gabon and Rwanda, Hogewoning et

TABLE 2. Prevalence of skin disorders in primary school children

Disorders (n:884 - 45.8%)	n	%
Eczama/dermatitis	634	32.8
Pityriasis alba	354	18.3
Xerosis	131	6.8
Atopic dermatitis	32	1.6
Pigmentary disorders	334	17.2
Freckles	157	8.1
Nevus	59	3.0
Leukonychia	39	1.4
Hair and scalp disorders	197	10.1
Pityriasis simplex	177	9.1
Miliaria	29	1.5
Acne vulgaris	186	9.6
Urticaria	4	0.2
Other disorders	102	5.3
Onychophagy	28	1.4
Vascular diseases	21	1.1
Psoriasis	7	0.4
Acrochordon	6	0.3

TABLE 3. Distribution of skin disorders according to sex

Skin disorders	Girl	Boy	Total	%	p	OR (95%CI)
Skin infections	141	117	258	13.4	0.066	1.28 (0.98-1.66)
Parasitic	45	14	59	3.1	0.000	3.41 (1.86-6.26)
Bacterial	6	8	14	0.7	0.063	0.77 (0.26-2.22)
Viral	93	89	182	9.4	0.615	1.08 (0.79-1.46)
Eczema	239	290	529	27.4	0.025	0.79 (0.65-0.97)
Pigmentary disorders	185	119	304	15.7	0.000	1.74 (1.35-2.23)
Hair and scalp disorders	148	48	196	10.1	0.000	3.56 (2.54-5.00)
Acne vulgaris	108	78	186	9.6	0.012	1.47 (1.08-2.00)
One or more identifiable skin conditions	618	524	1142	59.1	0.000	1.60 (1.33-1.92)

al. reported that the prevalence of skin disorders varied from 26.7% to 45.8% among school children. In addition, the most common skin disorders were skin infections. Tinea capitis was the most common skin infection, followed by pyoderma, nevi, miliaria, scars, xerosis cutis and inflammatory skin disorders such as acne and eczema were the other common skin disorders (12). Shrestha et al. studied 4795 school children under the age of 15 in Nepal and found that the prevalence of skin disorders was 22.64% among the study population. The most common skin disorders were dermatitis and eczema (26.46%), followed by bacterial infections (16.13%), urticaria (15.71%), viral infections (14.12%), fungal infections (7.3%), scabies (5.03%) and miliaria (2.75%) (13). Dugra and Kumar studied the North Indian population and reported the following common skin disorders among the study population: skin infections (11.4%), pityriasis alba (8.4%), dermatitis (5.2%), infestation (5.0%) and pigmentation disorders (2.6%).¹⁴

We compared the results of earlier studies in table 4. In our study, the overall point prevalence of skin disorders was 59.1% among children. The most common skin disease was eczema (32.8%), followed by pigmentation disorders (17.2%), infectious skin disorders (13.4%), acne vulgaris (9.6%) and pityriasis simplex (9.1%). Viral infections, particularly warts, were the most common form of infectious dermatitis (9.4%). In addition, the prevalence of pediculosis capitis, vitiligo and psoriasis were 2.0%, 0.2%, 0.4%, respectively. Unlike other studies acne vulgaris and pigmentation disorders found more common in our study. It might be due to the fact that the age range of students was bigger. The most frequent dermatological diseases found in studies conducted in Turkey were acne vulgaris, nevi and dermatitis, and it was dermatitis in this study. Studies of the other countries reported infectious diseases, acne and dermatitis as the most frequent dermatological diseases. These findings were in agreement with those of the Turkish studies. But still, the frequency rate of these dermatoses may vary based on the socioeconomic status and developmental level of a given region.

Our study is the first one that investigates commonly seen skin disorders in primary school children in Turkey. Moreover, no other similar study conducted in Diyarbakir was encountered. The limitation of our study is not to be reached to the number of students planned at the beginning.

In conclusion, studies show that the prevalence and diversity of skin disorders vary

slightly from one country to another. In our study, skin disorders were found to be quite common among children. The most common skin disorders found in this study were simple and could usually be cured easily. Preventive and curative health services should be provided especially for pensioners and girls as skin disorders are more prevalent in this group of children. Awareness of families and teachers of children should be raised in terms of being more sensible about dermatological diseases and directing them to relevant experts in case of any suspect. Finally, sufficient number of trained health care professionals, effective health policies and improvements in the socio-economic conditions could be required to achieve a considerable reduction in the prevalence of skin disorders among children. ■

TABLE 4. Comparison of the results between our study and earlier studies

	n	Age	Disorders
Şaçar et al.	1756	0-12	<ul style="list-style-type: none"> • Eczema/dermatitis 26% • Infectious dermatoses 20.6% • Erythematous scaly diseases 9.9% • Xerosis 7.8% • Pigmentation disorders 6.7%
Tamer et al.	6300	0-16	<ul style="list-style-type: none"> • Acne vulgaris 12.4% • Atopic dermatitis 11.8% • Contact dermatitis 11.3% • Warts 9.5% • Impetigo 4.3%
İnanır et al.	785	6-14	<ul style="list-style-type: none"> • Melanocytic nevi 14.4% • Keratosis pilaris 12.5% • Pityriasis alba 12% • Xerosis 11.8% • Pediculosis capitis 9.4% • Atopic dermatitis 6.8%
Dogra and Kumar	12586	6-14	<ul style="list-style-type: none"> • Infectious dermatoses 11.4% • Pityriasis alba 8.4% • Eczema/dermatitis 5.2% • Infestations 5.0% • Pigmentation disorders 2.6%
Yang et al.	4067	6-11	<ul style="list-style-type: none"> • Acne vulgaris 17.7% • Ephelides 8.4% • Warts 2.4% • Atopic dermatitis 1.7%
Shrestha et al.	4795	0-14	<ul style="list-style-type: none"> • Eczema/dermatitis 26.46% • Bacterial infections 16.13% • Urticaria 15.71% • Viral infections 14.12% • Fungal infections 7.3%
Our study	1932	6-17	<ul style="list-style-type: none"> • Eczema/dermatitis 32.8% • Pigmentation disorders 17.2% • Infectious dermatoses 13.4% • Acne vulgaris 9.6% • Pityriasis simplex 9.1%

REFERENCES

1. Inanir I, Sahin MT, Gündüz K, Dinc G, et al. Prevalence of skin conditions in primary school children in Turkey: differences based on socioeconomic factors. *Pediatr Dermatol* 2002;19(4):307-11.
2. Ogunbiyi AO, Owoaje E, Ndahi A. Prevalence of skin disorders in school children in Ibadan, Nigeria. *Pediatr Dermatol* 2005;22(1):6-10.
3. Çetinkaya Z, Altindis M, Kulaç M, Karaca S, et al. Prevalence of *pediculus capitis* in primary schools in Afyon and treatment with permethrin. *Turkiye Parazitol Derg* 2004;28(4):205-9.
4. Oruk S, Ilter N, Atahan ÇA, Gürer MA. Dermatological problems in children. *Turkiye Klinikleri J Dermatol* 2002;12(1):1-4.
5. Özcan A, Senol M, Bayram N, Aki T, et al. The evaluation of dermatological diseases in primary health care centers. *Turkiye Klinikleri J Dermatol* 2005;15(3):129-35.
6. Hayden GF. Skin diseases encountered in a pediatric clinic. A one-year prospective study. *Am J Dis Child* 1985;139(1):36-8.
7. Eichenfield LF, Tom WL, Chamlin SL, Feldman SR, et al. Guidelines of care for the management of atopic dermatitis: section 1. Diagnosis and assessment of atopic dermatitis. *J Am Acad Dermatol* 2014;70(2):338-51.
8. Hanifin JM. Atopic dermatitis in infants and children. *Pediatr Clin North Am* 1991;38(4):763-89.
9. Turkish Statistical Institute. Diyarbakir population 2013. Ankara, 2013. [Accessed on: May 29, 2014]. Available at: http://rapor.tuik.gov.tr/reports/rwservlet?adnksdb2&ENVID=adnksdb2Env&report=wa_turkiye_il_koy_sehir.RDF&p_il1=21&p_kod=2&p_yil=2013&p_dil=1&desformat=html
10. Saçar H, Saçar T. Prevalence of dermatosis during childhood. *Türkderm* 2010;44:132-7.
11. Tamer E, Ihan MN, Polat M, Lenk N, et al. Prevalence of skin diseases among pediatric patients in Turkey. *J Dermatol* 2008;35(7):413-8.
12. Hogewoning A, Amoah A, Bavinck JN, Boakye D, et al. Skin diseases among schoolchildren in Ghana, Gabon, and Rwanda. *Int J Dermatol* 2013;52(5):589-600.
13. Shrestha R, Shrestha D, Dhakal AK, Shakya A, et al. Spectrum of pediatric dermatoses in tertiary care center in Nepal. *Nepal Med Coll J* 2012;14(2):146-8.
14. Dogra S, Kumar B. Epidemiology of skin disease in school children: a study from northern India. *Pediatr Dermatol* 2003;20(6):470-3.