Prevalence of pediatric dermatoses in a university hospital in southeastern Brazil

Prevalência de dermatoses pediátricas em um hospital universitário na região sudeste do Brasil

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Abstract: BACKGROUND: Numerous dermatoses affects children, depending on age, region and socioeconomic status.
OBJECTIVE: To determine the prevalence of pediatric dermatoses at the Dermatology Department of a University Hospital, involving the diagnosis, age and sex.
METHODS: Epidemiologic cross-sectional study carried out in the period between July 2006 and December 2007. There were reviewed the handbooks of 264 patients from the Pediatric Dermatology Department of a University Hospital in this period. The dependent variable was the existence or not of dermatoses in children of age up to 19 years. Independent variables were: clinical diagnosis, sex and age.
RESULTS: Of the 264 handbooks reviewed, there was a higher prevalence of allergic dermatoses in 74 cases (28,0%), followed by inflammatory dermatoses in 49 cases (18,6%), pigmentary dermatoses in 42 cases (15,9%), infectious dermatoses with 38 cases (14,4%), benign tumors in 25 cases (9,5%), miscellaneous in 14 cases (5,3%), genodermatosis with 12 cases (4,5%) and skin annexes disorders with 10 cases (3,8%). The infants represented 11,3 % of the total, the pre-school 15,9 %, the schoolboys 48,8 %, and the adolescents 23,8 %. There was greater prevalence of allergic dermatoses in pre-school with 15 cases (35,7%), infants with 10 cases (33,3%) and schoolboys with 39 cases (30,2 %). Among adolescents are highlighted inflammatory dermatoses. The study showed no statistical differences between sex and age.
CONCLUSIONS: The study of the epidemiological profile makes easy the diagnosis of pediatric dermatoses encouraging good history and search for prevention.
Keywords: Adolescent health; Child health (Public health); Epidemiology; Skin diseases

Resumo: FUNDAMENTOS: Numerosas dermatoses afetam crianças, dependendo da idade, da região e da classe socioeconômica.
OBJETIVO: Determinar a prevalência de dermatoses pediátricas em um hospital universitário, considerando-se o diagnóstico, a idade e o sexo.
MÉTODOS: Estudo epidemiológico transversal realizado de julho de 2006 a dezembro de 2007. Análise dos prontuários de 264 pacientes do Ambulatório de Dermatologia Pediátrica de um hospital universitário nesse período. A variável dependente foi a existência ou não de dermatoses em crianças até os 19 anos de idade. Entre as variáveis independentes obtiveram-se: diagnóstico clínico, sexo e idade.
RESULTADOS: Dos 264 prontuários analisados, observou-se maior prevalência de dermatoses alérgicas em 74 casos (28,0%), seguidas por dermatoses inflamatórias em 49 casos (18,6%), dermatoses pigmentares em 42 casos (15,9%), dermatoses infecciosas em 38 casos (14,4%), tumores benignos em 25 casos (9,5%), miscelânea em 14 casos (5,3%), genodermatoses em 12 casos (4,5%) e afecções de anexos cutâneos em dez casos (3,8%). Os lactentes perfizeram 11,3% do total, os pré-escolares, 15,9%, os escolares, 48,8% e os adolescentes, 23,8%. Observou-se maior incidência de dermatoses alérgicas em pré-escolares em 15 casos (35,7%), em lactentes em dez casos (33,3%) e em escolares em 39 casos (30,2%). Entre os adolescentes destacaram-se as dermatoses inflamatórias. O estudo não mostrou diferenças estatísticas entre sexo e faixa etária.
CONCLUSÕES: O estudo do perfil epidemiológico facilita o diagnóstico das dermatoses pediátricas, incentivando a boa anamnese e a busca da prevenção.
Palavras-chave: Dermatopatias, Epidemiologia, Saúde da Criança, Saúde do Adolescente

Received on 14.02.2010.
Approved by the Advisory Board and accepted for publication on 08.08.10.
* Work conducted at the Dermatology Service, University Hospital of Taubate – University of Taubate (HUT - UNITAU) - Sao Paulo (SP), Brazil.
Conflict of interest: None / *Conflito de interesse: Nenhum*
Financial funding: None / *Suporte financeiro: Nenhum*

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INTRODUCTION

Numerous skin diseases affect children; however, they differ depending on age, region and socioeconomic status.

Although there is a considerable prevalence of pediatric skin diseases, the existence of few studies on this subject makes the planning of health actions difficult. [1,2]

Studies conducted in developed countries show that skin diseases account for 6-24% of the total visits to pediatric clinics and 9.8% of visits to university health care centers.[3,5]

The importance of this study lies in the need for an epidemiological survey of the prevalence of skin diseases in children in developing countries to help implement preventive measures to decrease their prevalence. [6]

Bechelli et al. found that 87% of the individuals in rural Brazil had treatable skin disorders. The diseases most frequently found are infections and infestations such as pediculosis, dermatophytosis and impetigo. [7]

A similar study in Northeast Brazil (Pernambuco) [2] on the prevalence of pediatric skin diseases was also found.

This study aimed to estimate the prevalence of pediatric skin diseases in the Pediatric Dermatology Outpatient Clinic of a university hospital in southeastern Brazil. Gender and age were associated with the diagnosis and the study also serves as a contribution to future surveys.

METHODS

We conducted a cross-sectional epidemiological study from July 2006 to December 2007 by collecting data from the medical records of 264 patients seen at the Pediatric Dermatology Outpatient Clinic of the University Hospital of Taubate in this period. This outpatient service caters to patients from underprivileged economic classes and is recognized as a specialized reference service in the region.

Taubate is a municipality of Sao Paulo, southeastern Brazil, with around 270,000 inhabitants, located in the Paraíba Valley, 120km away from the state capital, Sao Paulo. Situated midway between Serra do Mar and Serra da Mantiqueira, Taubate is at an altitude of 580m and above sea level, with an approximate area of 630km ^{2}. It is the second largest industrial and commercial area in the region (Paraiba Valley).

The dependent variable was the presence or absence of skin diseases in children up to 19 years of age. Clinical diagnosis, gender and age were among the independent variables.

Data were entered into an Excel spreadsheet and analyzed with the Statistical Package for Social Sciences 15.0 software. Student's t test was used to compare mean age. The Chi-square and Fisher's exact tests were also used, with alpha significance level of <5% ($p < 0.05$). For data without normal distribution the nonparametric Mann-Whitney test was used. Interquartile differences were obtained.

The study population was classified according to age group: infants (0-2 years), preschoolers (2 to 5 years), school-age children (between 5 and 12 years) and adolescents (from 12 to 19 years).

Review diagnoses were entered in the spreadsheet and later divided into eight nosological groups, as shown in Table 1.

This study was approved by the Ethics and Research Committee of the institution where data were collected under the number 0308/07.

RESULTS

Of the 264 medical charts reviewed, there was a higher prevalence of allergic skin diseases in 74 cases (28.0%). Inflammatory skin diseases were found in 49 cases (18.6%), pigmentary skin diseases in 42 (15.9%), infectious skin diseases in 38 (14.4%), benign tumors in 25 (9,5%), miscellaneous in 14 (5.3%), genodermatosis in 12 (4.5%) and diseases of skin appendages in 10 cases (3.8%).

Infants totaled 11.5% of the sample, preschoolers 15.9%, school-age children 48.8%, and adolescents 23.8%, showing that the highest frequency of dermatologic diseases occurs in school-age children.

According to analysis of diagnosis and age group (table 1), we observed a higher incidence of allergic skin diseases in preschool children in 15 cases (35.7%), infants in 10 cases (33.3%) and school-age children in 39 cases (30.2%). Among adolescents, there was a higher prevalence of inflammatory skin diseases in 23 cases (36.5%)

In the distribution of patients by sex there was a statistically significant difference ($p < 0.01$), with a predominance of girls in 151 cases (57.2%) (Table 2). This prevalence continued when distributed among age groups, infants (60%), preschoolers (50%), school-age children (58.1%) and adolescents (58.7%) (Table 3).

The mean age of the group was 9.0 years (SD = 4.4) and median = 9.0 years. For females the mean age was 9.1 years (SD = 4.4), median = 10.0 years (IQR 6.5, [6.0 - 12.5]) and for males it was 8.9 years (SD = 4.3) median = 9.0 years (IQR = 7.0, [5.0 -

Chart 1: List of the eight groups used to classify pediatric dermatoses (n = 264)

Infectious skin diseases	Viral wart / Pityriasis versicolor / Tinea corporis / Molluscum contagiosum / Tinea cruris / Scabies / Epidermodysplasia verruciformis / Onychomycosis/ Hand, foot and mouth disease / Impetigo
Inflammatory dermatosis	Acne vulgaris / Acquired plantar keratoderma/ Sebohrreic dermatitis / Folliculitis / Psoriasis/ Líchen planus / Líchen nitidus and lichen striatus / Líchen sclerosus ET atrophicus
Genodermatosis	Ichthyosis vulgaris / Lamellar ichthyosis / keratosis pilaris / Acrokeratoelastoidosis/ Distrophic epidermolysis bullosa / Neurofibromatosis
Pigmentary dermatosis	Pytiriasis alba / Vitiligo / Residual hyperchromia
Allergic skin diseases	Atopic dermatitis / Prurigo estrofulus / Neurodermatitis/ Eczematid / Urticaria / Contact dermatitis / Xerosis (Atopy)
Disorders of skin appendages	Miliaria / Hyperhidrosis / Alopecia areata
Benign tumors	Deep hemangioma / Melanocytic nevus / Epidermal nevus / Nevus spilus / halo nevus / Verrucous nevus/ Mastocytoma / juvenile Xanthogranuloma
Miscellaneous	Hypertrichosis / Synphalangism / Erythroderma / Purpura / Scarring / Sebaceous hyperplasia of the newborn / Víbices / Atrophodermia vermiculata / Neurodermatitis / Scleroderma / Granuloma annulare

12.0]). The medians showed no statistically significant difference (p = 0.62).

Allergic skin diseases were the most prevalent in males in 32 cases (28.3%) and in females in 42 cases (27.8%), followed by inflammatory disorders in 20 cases (17.7%) and 29 cases (19.2%), respectively (Table 2).

Among allergic skin diseases, which were the most prevalent, atopic dermatitis was the most common in 45 cases (60.8%).

In relation to infectious skin diseases, viral warts and molluscum contagiosum were the most prevalent in 15 cases (39.4%) and 8 cases (21.0%), respectively.

The group of inflammatory skin diseases included acne vulgaris in 16 cases (32.6%), followed by seborrheic dermatitis in 11 cases (22.4%) and psoriasis in 10 cases (20.4%).

Genodermatoses, congenital diseases, were represented by lamellar ichthyosis, ichthyosis vulgaris, epidermolysis bullosa, as well as neurofibromatosis, acrokeratoelastoidosis and keratosis pilaris.

Pigmentary disorders included pityriasis alba in 21 cases (50.0%) and vitiligo in 18 cases (42.8%).

Disorders of skin appendages included alopecia, hyperhidrosis and miliaria.

The miscellaneous group included other diagnoses that did not fit in the previous groups.

The above data are shown in table 4.

DISCUSSION

The results of this study were similar to the few works already published about this subject, thus filling a gap in the description of pediatric skin diseases in our region and country.

The prevalence of skin diseases in childhood is very high both in developing and developed countries. Studies such as those by Fung *et al.* [6] and Noronha *et al.* [8] reported this high prevalence (31.3% and 24.0%, respectively), although the most prevalent diseases are different in these two studies.

Fung *et al.* [6] conducted a study with school-age children and adolescents in a health center in Hong Kong in which he documented disease prevalence and dermatological pattern among middle and high school students in the age range of 8 -21 years.

A higher prevalence of acne was observed in adolescents (9.9%). Atopic eczema (6.8%) and melanocytic nevi (3.6%) were more incident in middle school children, in contrast to studies conducted in some developing countries in which the prevalence of infectious skin diseases was higher. [1,9]

Infectious diseases have a high prevalence in most studies, ranging from 21.9% - a percentage observed in the study by Wisuthsarewong - [10] to 81.2%, as reported by Figueroa et al.[9] However, in this study, they were not as prevalent.

In a study by Ogunbiyi et al., [1] dermatophytosis (15.2%), as well as pityriasis versicolor (4.7%) and

Table 1: Prevalence of diagnoses in the respective age groups. Taubaté, Brazil - 2006-2007

Diagnosis	Infants		Preschooles		School-age children		Adolescents		Total	
	N	%	N	%	N	%	N	%	N	%
Disorders of skin appendages	0	0.0	2	4.7	3	2.3	5	7.9	10	3.8
Allergic skin diseases	10	33.0	15	35.7	39	30.2	10	15.8	74	28.0
Pigmentary dermatosis	3	10.0	7	16.6	22	17.0	10	15.8	42	15.9
Infectious dermatosis	4	13.0	6	14.2	24	18.6	4	6.3	38	14.4
Inflammatory dermatosis	2	6.0	3	7.1	31	24,0	23	36.5	49	18.6
Genodermatosis	0	0.0	2	4.7	4	3.1	6	9.5	12	4.5
Benign tumors	7	23.0	6	14.2	9	6.9	3	4.7	25	9.5
Miscellaneous	4	13.0	1	2.3	7	5.4	2	3.1	14	5.3
Total	30	11.5	42	15.9	129	48.8	63	23.8	264	100.0

N and % - Absolute values and percentages relative to the total of each group

scabies (4.7%) were the most prevalent infections, followed by tribal and scarring marks in the body. These tribal marks were common decades ago in some parts of Africa and were used to recognize a member of the tribe at first sight. They believed the scars would protect them from "witchcraft". In this study, infectious skin diseases amounted to about 14% of the cases.

Most allergic skin diseases in childhood are usually atopic dermatitis followed by contact dermatitis. Atopic dermatitis is the major cause of morbidity in infants in the Western world. It is difficult to determine its precise incidence because oligosymptomatic cases often go unnoticed. [11]

There was no statistical difference between genders or a slight predominance of female patients was found in most studies reviewed, including the present one, even when each age group was individually analyzed. [1,2,6,8]

At the public university hospital where the study was conducted, where most patients are from a lower socioeconomic level, there was a higher prevalence of allergic skin diseases, contrasting with studies by Inanir et al., [12] which indicate the prevalence of infectious diseases in populations of lower socioeconomic status, and with studies by Figueroa *et al.,* [9] which showed a high prevalence of infectious skin diseases (81.2%) in poor schoolchildren in a rural community.

Considering the results obtained, the most common pediatric skin diseases at this hospital were allergic skin diseases, predominantly among preschool children, infants and school-age children. There was no statistical difference and, therefore, there was similar prevalence in both genders. However, inflammatory skin diseases prevailed among adolescents, which was justified by the high prevalence of acne vulgaris, a condition that develops during puberty in most young individuals and in both genders, in agreement with the findings by Fung *et al.*

Table 2: Distribution of diagnosis by gender.Taubaté, Brazil - 2006-2007

Diagnosis	Men		Women		Total	
	N	%	N	%	N	%
Disorders of skin appendages	4	3.6	6	3.9	10	3.8
Allergic skin diseases	32	28.3	42	27.8	74	28.0
Pigmentary dermatosis	19	16.8	23	15.2	42	15.9
Infectious dermatosis	14	12.4	24	15.9	38	14.4
Inflammatory dermatosis	20	17.7	29	19.2	49	18.6
Genodermatosis	7	6.2	5	3.4	12	4.5
Benign tumors	12	10.6	13	8.7	25	9.5
Miscellaneous	5	4.4	9	5.9	14	5.3
Total	113	42.8	151	57.2	264	100.0

N and % - Absolute values and percentages relative to the total of each group

Table 3: Distribution of cases by gender and age range. Taubaté, Brazil - 2006-2007

Gender	Infants		Preschoolers		School-age children		Adolescents		Total	
	N	%	N	%	N	%	N	%	N	%
Male	12	40.0	21	50.0	54	41.9	26	41.3	113	42.8
Female	18	60.0	21	50.0	75	58.1	37	58.7	151	57.2
Total	30	11.5	42	15.9	129	48.8	63	23.8	264	100.0

N and % - Absolute values and percentages relative to the total of each group

[6] Allergic skin diseases were equally distributed among genders, which is also in agreement with the literature. [13]

The study showed atopic dermatitis as the most common allergic skin disease.

Finally, since there is a higher prevalence of allergic skin diseases in these age groups, the diagnosis of these diseases can be facilitated/inferred through good clinical examination combined with anamnesis, and aided by knowledge of the epidemiological profile of the population presented in this study. With regard to the results obtained in this study, we highlight the importance of further studies to identify the main factors involved in the development of skin diseases in the children who come to this hospital, seeking the orientation of relatives and the establishment of future prophylactic measures.

A possible limitation of this study perhaps lies in the fact that it was conducted in a university hospital which serves a specific clientele (users of SUS, Brazil's publicly funded health care system) and may not represent the true prevalence of skin diseases in the municipality of Taubate and region among children and adolescents, given the care provided in private clinics and hospitals.

CONCLUSION

This study revealed the most prevalent skin diseases at the University Hospital of Taubate in the pediatric population. Allergic skin diseases predominated in infants, preschoolers and school-age children and inflammatory skin diseases prevailed among adolescents. ❑

Table 4: Most frequent skin diseases, their absolute values and percentages. Taubaté, Brazil - 2006-2007

Nosological groups	Most frequent skin diseases	N	%
Disorders of skin appendages (n=10)	Alopecia areata	5	50.0 %
	Miliaria	2	20.0 %
Allergic skin diseases (n=74)	Atopic dermatitis	45	60.8 %
	Contact dermatitis	5	6.7 %
Pigmentary skin diseases (n=42)	Pytiriasis alba	21	50.0 %
	Vitiligo	18	42.8 %
Infectious skin diseases (n=38)	Viral wart	15	39.4 %
	Molluscum contagiosum	8	21.0 %
Inflammatory skin diseases (n=49)	Acne vulgaris	16	32.6 %
	Dermatite seborréica	11	22.4 %
Genodermatosis (n=12)	Keratosis pilaris	4	33.3 %
	Ichthyosis vulgaris	4	33.3 %
Benign tumors (n=25)	Melanocytic nevus	10	40.0 %
	Hemangioma	5	25.0 %
Miscellanious (n=14)	Scarring	2	14.2%

N and % - Absolute values and percentages relative to the total of each group

KNOWLEDGMENTS

The authors thank the students Flavia Rezende Cury and Natali Minot do Couto Moraes for data collection.

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How to cite this article/*Como citar este artigo*: Ferreira FR, Nascimento LFC, Cirvidiu DC. Prevalence of pediatric dermatoses in a university hospital in Southeastern Brazil. An Bras Dermatol. 2011;86(3):477-82.