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ORIGINAL ARTICLE

Skin disorders in childhood: pattern of dermatoses in a pediatric dermatology task force effort

Renata Rolim Sakiyama[1], Kerstin Taniguchi Abagge[1]

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Skin Diseases,
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Abstract

Objectives: The present study aims to trace a pattern of patients referred to the specialized centers of pediatric dermatology, which were attended in a workforce on 2016. **Methods:** It is a retrospective, cross-sectioned, observational and analytical study. Data were collected from the medical records. Children and adolescents from zero to sixteen years of age were included. Provided data were: age, sex, time of disease progression, previous treatments, comorbidities, diagnostic hypotheses, performed conducts, and outcomes. **Results:** Of the 261 patients, 59% female, 13.8% infants, 31.4% preschoolers, 31.8% school, and 22.9% teenagers. The majority (62.5%) had no comorbidities, and among the 98 who presented some, a predominance of atopic diseases was observed: rhinitis in 22.6% and asthma in 15%. The majority, 63.2%, had already received some type of treatment. Eczematous disorders were the most prevalent (37.2%), followed by infectious ones (21%), benign hyperplasias and neoplasms (15.7%). Atopic dermatitis occurred in 19.9% of patients. Among the infections, viral infections occurred in a greater number (11.8%), mainly in the preschool and school groups. Among the glandular disorders, acne was the most frequent (11.5%), and its highest prevalence was in adolescents. More than a half, 52.5% of the patients were discharged, 32.6% were referred to pediatric dermatology and 9.6% were directed to maintain the follow-up in primary care. **Conclusion:** Eczematous disorders were the most frequent skin diseases, followed by infectious ones and by the group of benign hyperplasias and neoplasms. Among eczemas, atopic dermatitis was the most prevalent.

[1] UFPR, Department of Pediatrics - Curitiba - PR - Brazil.

Correspondence to:
Renata Rolim Sakiyama.
Universidade Federal do Paraná. Rua XV de Novembro, nº 1299, Centro. Curitiba - PR. Brazil. CEP: 80060-000. E-mail: re_sakiyama@hotmail.com

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INTRODUCTION

Skin disorders are very common in children, accounting for about 30% of complaints in pediatric visits. Among consultations with dermatologists, 30% involve children[1,2].

The prevalence of skin disorders in children is influenced by several factors such as age, sex, climate, geographic and socioeconomic aspects[2,3]. Many skin diseases appear only during childhood, some start in the first years of life and others present with very different clinical characteristics in children when compared to adults. In addition, there are skin signs present in syndromes (neurocutaneous alterations) and others that indicate systemic diseases, and that are not always similar to those found in adults.

Most skin conditions in children are acute; however, diseases such as psoriasis, vitiligo or atopic dermatitis can be chronic and affect patients for life, which can influence their appearance and cause problems in interpersonal relationships and in their quality of life[4].

Studies on the impact of dermatoses in the United States of America show that due to their high prevalence, the cost and public expenditures for these diseases are high, including those inherent to healthcare services and products and the loss of productivity, due to absenteeism from work and school[5].

Therefore, evaluating the impact of dermatoses in the pediatric population is fundamental for the practice of primary care, pediatrics and specialists in the area.[6] Epidemiological studies are important for understanding the spectrum of skin diseases in a given region and form the basis for care planning, health education and research activities[4,7].

The demand of patients seeking primary care with skin complaints varies from 10 to 36.5% depending on the region, and 4 to 10% of patients need to be referred to a specialist[8].

There is a wide variety of skin diseases that take patients to healthcare facilities, and primary care physicians are expected to have the ability to recognize, treat and monitor the most common lesions, and recognize those that need to be referred to secondary and tertiary services[8].

This study aims to trace a clinical-epidemiological profile of the patients and the main dermatoses treated in a Pediatric Dermatology task force carried out by the state's referral hospital in partnership with the Municipal Health Department.

MATERIAL AND METHOD

This is a retrospective, cross-sectional, observational and analytical study. The data were collected from the care forms prepared by the Pediatric Dermatology service of the state's referral hospital and completed by the doctors who worked during the collective effort on November 5, 2016, which took place on the premises of one of the Basic Health Units of the state.

According to a survey by the Municipal Healthcare Department, there were approximately 2,000 children and adolescents on the waiting list for pediatric dermatology care in 2016. All Healthcare Units were instructed to contact the families of the patients and check if there was still a need for specialized care, and to schedule those who confirmed interest and availability.

All children and adolescents from zero to sixteen years of age seen by the task force were included. The Research Project was approved by the Institution's Research Ethics Committee (nº 64806817.0.0000.0096).

The data evaluated were age, sex, time of disease evolution, previous treatments, presence of comorbidities, diagnostic hypotheses, conduct performed and outcome of care: if the patient was discharged, he was referred to a Basic Healthcare Unit or a tertiary care center.

The distribution of patients by age group was as follows: infant (0 to 2 incomplete years old), preschool (2 to 6 incomplete years old), school-aged (6 to 12 incomplete years old) and adolescents (12 to 16 years and 11 months old) . The dermatoses found were divided into the following groups, according to the Hurwitz classification[9]: eczematous, papulosquamous, infectious, benign hyperplasia and neoplasms, sebaceous and sweat gland disorders, hair and nail disorders, pigmentary disorders, vascular disorders, hypersensitivity reactions and others. All the diagnoses received by the patients during the task force were counted to determine the frequency of dermatoses by category and individually. If the patient had more than one skin lesion, each one was counted separately, unless there was diagnostic doubt or if they were the same disease. The patients without diagnostic certainty were excluded.

The data were plotted in an electronic spreadsheet (Microsoft Excel®) and analyzed using the JMP® software.

RESULTS

The number of patients seen in the task force was 261, of which 154 (59%) were female. The age ranged from 2 months to 198 months (16.5 years), with a median of 92 months (7.6 years). The distribution by age group was as follows: 13.8% were infants, 31.4% preschoolers, 31.8% schoolchildren and 22.9% adolescents. As for comorbidities, the majority (62.5%) did not have associated diseases, and among the 98 people (37.5%) who did, there was a predominance of atopic diseases, with rhinitis present in 22.6% of the cases, asthma in 15% and atopic dermatitis in 2.7%. The time of evolution of skin diseases ranged from 2 months to 12 years, with a median of 12 months. The majority, 63.2%, had already received some type of treatment (Table 1).

A little over half of the patients (53.3%) received only 1 diagnosis, 29.5% received two diagnoses, 11.1% three diagnoses, 1.2% had four diagnoses and 1 patient had 5 diagnoses. In 10 patients there was no diagnostic certainty, and one patient had no skin lesion at the time of consultation.

Table 2 depicts the number of patients per group of disease and their prevalence in percentage. The group of

eczematous disorders was the most prevalent, occurring in 97 patients (37.2%), followed by infectious (21%), hyperplasia and benign neoplasms (15 .7%); and glandular disorders (13.4%).

Atopic dermatitis was the most frequent dermatosis, diagnosed in 19.9% of the patients. Still within the group of eczematous disorders, pityriasis alba was found in 9.5% and contact dermatitis in 6.1%.

The second most prevalent group was infections disorders, seen in 21% of the patients. Viral infections occurred in 11.8%, bacterial in 6.1%, fungal in 3.5% and parasitic in 1.1%. Among the viral infections, warts were found in 6.1% of the sample and molluscum contagiosum in 5.3%; of bacterial infections, 6 cases (2.3%) were secondary infections, 4 cases (1.5%) were folliculitis, 4 cases (1.5%) were impetigo and 2 cases, boil. Of the fungal infections, tinea was the most prevalent, with 5 cases. And of the infections by parasites and insects, the 3 diagnosed cases were of pediculosis (1.1%).

The third group, classified as benign neoplasms and hyperplasia, occurred in 15.7% of the patients, with the main representative being nevi (10.7%), among them melanocytic nevi and hypochromic nevi had a higher prevalence, occurring in 4.2% and 3.8% respectively. Glandular disorders occurred in 13.4% of the patients seen. In this group, acne was the most frequent, diagnosed in 11.5%, with its highest prevalence in the group of adolescents. Pigment disorders had a prevalence of 8.8%, with vitiligo occurring in 3.5% of patients. Hair and nail disorders had a prevalence of 3.5%, with alopecia areata affecting half of the cases in this group. Papulosquamous disorders and vascular malformations were the groups with the lowest prevalence. Hemangioma occurred in four cases, and all patients with this disorder were females.

Hypersensitivity reactions were diagnosed in 8.8% of patients. Scrofulous prurigo occurred in greater numbers (7.3%).

Among the disorders not classified in any group, xerosis was the most frequent (13.8%) followed by keratosis pilaris (6.9%). Table 3 presents the main disorders found in the study by order of frequency.

Table 4 shows the most frequent dermatoses by age group. We can see that atopic dermatitis had a homogeneous distribution among the age groups from 2 months to 12 years. There was a greater prevalence of acne among the

Table 1. Clinical-epidemiological profile of patients seen in the 2016 pediatric dermatology task force.

VARIABLE		n	%
Sex	Females	154	59
	Males	107	41
Age	2m to 2 years	36	13.8
	2 to 7 years	82	31.4
	7 to 12 years	83	31.8
	12 to 16 years	60	23
Comorbidities	Yes	98	37.5
	No	163	62.5
Previous treatments	Yes	165	63.2
	No	96	36.8
Total		261	100
	Minimum	Maximum	Median
Time of progression	2 months	12 years	12 months
Age	2 months	198 months	92 months

Table 2. Prevalence of dermatoses found in the 2016 pediatric dermatology taskforce.

	n	%
Eczematous disorders	97	37.2
Infectious disorders	55	21
Hyperplasia and benign neoplasms	41	15.7
Disorders of sebaceous and sweat glands	35	13.4
Pigmentary disorders	23	8.8
Hypersensitivity reactions	23	8.8
Hair/nail disorders	9	3.5
Vascular disorders	6	2.3
Papulosquamous disorders	6	2.3
Others	65	24.9

Table 3. Main dermatoses found in the pediatric dermatology taskforce work in descending order.

	n	%
Atopic dermatitis	52	19,9
Xerosis	36	13,8
Acne	30	11,5
Pityriasis alba	25	9,5
Scrofulous Prurigo	19	7,3
Pilar keratosis	18	6,9
Contact dermatitis	16	6,1
Warts	16	6,1
Molluscum contagiosum	14	5,3
Melanocytic nevi	11	4,2

Table 4. Main dermatoses by age group found in the 2016 pediatric dermatology taskforce.

Age	0-2 years inc. (n=36)	%	2-7 years inc. (n=82)	%	7-12 years inc. (n=83)	12-17 years inc. (n=60)	%
Dermatoses	Atopic Derm. Xerosis Nevi Scrofulous prurigo Hemangioma		Atopic Derm. Nevi Molluscum contagiosum Xerosis Scrofulous prurigo Contact dermatitis		Atopic derm. Pityriasis alba Xerosis Wart Nevi Scrofulous prurigo	Acne Pilar keratosis Nevi Vitiligo Folliculitis	

Legend: inc.: incomplete; Derm.: dermatitis.

adolescents, and hemangioma occurred predominantly in the group of infants. A higher frequency of viral infections was also seen among the preschool and school aged groups.

Regarding management, 218 patients (83.5%) received treatment, 21 of whom underwent some procedure on the day of the task force work (curettage, cryotherapy, biopsy or chemical cautery). For 14 patients (5.3%) further testing was requested, such as direct mycology and culture, blood count, blood glucose, thyroid function, serology and urinalysis.

Regarding the outcomes, more than half of the patients (52.5%) were discharged, 85 patients (32.6%) were referred to pediatric dermatology and 25 (9.6%) were instructed to maintain the dermatosis follow-up in a Healthcare center. Fourteen patients (5.3%) were referred to other specialties, 8 of them to pediatric pulmonology/allergology.

Table 5 presents the dermatoses referred to pediatric dermatology by the team of dermatologists in the collective effort by the taskforce. There are 18 cases of atopic dermatitis, which represents 36.4% of the total atopic dermatitis cases. Of the papulosquamous cases, all psoriasis patients were referred, including those that had psoriasis as a diagnostic hypothesis and were not counted due to diagnostic uncertainty. Among the cases of vitiligo, 77.7% were referred, as well as all patients with neurofibromatosis, chronic urticaria, achromic spot and tumor. Ten patients with nevus were referred, as well as one with mastocytosis.

Of the 23 patients referred with infectious disease, 9 had warts, 4 molluscum contagiosum, 4 tinea, 1 folliculitis, and 5 secondary dermatitis infection. Of the glandular disorders, 7 patients with acne required follow-up, as well as 1 case of hypohidrotic ectodermal dysplasia. Almost all patients with alopecia areata (80%) were referred, as well as 1 case of loose anagen syndrome.

DISCUSSION

Childhood dermatoses are prevalent and need to be understood so that preventive measures and public healthcare policies can be implemented according to local epidemiology. In addition, knowledge of the main skin diseases is essential for the academic training of general practitioners and pediatricians.

In the present study, atopic dermatitis was the most frequent skin disease, a result very similar to that of several studies, which demonstrate that the incidence of this dermatosis has been increasing worldwide.[10,11] One of the hypotheses found in the literature would be the improvement of socioeconomic conditions, hygiene and poverty of the population, reducing the prevalence of infectious diseases and giving rise to chronic and inflammatory diseases. Atopic dermatitis is important for public health and healthcare professionals, because in addition to having high costs to the family, it brings with it a high emotional and social burden for both the patients and their families. Therefore, the diagnosis and management of this condition is relevant for healthcare professionals, given its high prevalence and influence on the quality of life of patients and families. An example of what can help in the treatment of these patients are educational programs and support groups,

Table 5. List of dermatoses referred from the taskforce to pediatric dermatology HC-PR.

Dermatoses	n(total)
Atopic dermatitis	18(52)
Contact dermatitis	5(16)
Frictional lichenoid dermatitis	1(3)
Dyshidrotic eczema	1(1)
Nummular eczema	1(1)
Warts	9(16)
Molluscum contagiosum	4(14)
Tinea	4(5)
Secondary infection	5(6)
Folliculitis	1(4)
Melanocytic nevus	7(11)
Hypochromic nevus	2(10)
Hypertrophic scar	1(2)
Mastocytosis	1(2)
Blue nevus	1(2)
Nevus spilus	2(2)
Tumor	1(1)
Acne	11(30)
Hypohidrotic ectodermic dysplasia	1(1)
Vitiligo	7(9)
Café au lait spot	1(2)
Chromic spot	1(1)
Urticaria	1(3)
Alopecia areata	4(5)
Poliosis	1(1)
Loose anagen syndrome	1(1)
Ichthyosis vulgaris	1(2)
Lichen spinulosus	1(2)
Psoriasis	2(2)
Hemangioma	2(4)
Type I neurofibromatosis	2(2)
Recurrent aphthous stomatitis	1(1)
Suspected lesions	10
Total	85

Source: the author (2017).

such as Clube da Dermatite, a support group organized by Hospital de Clínicas in partnership with Sociedade Paranaense de Pediatria, which serves, on average, 20 to 30 children (and their families) per month.

Atopic diseases, such as rhinitis and asthma, were the most frequently associated health conditions, as well as minor signs of atopy (xerosis, pityriasis alba and keratosis pilaris). This demonstrates the high prevalence of atopy and/or its stigmas among the cases, a fact that may be related to the characteristics of the population and the local climate[14].

Acne was present in 11.5% of the cases and, as expected, due to the characteristic of puberty, mostly belonging to the group of adolescents[15,16]. Some studies show that acne is one of the most common complaints in dermatology clinics[15,16], and should not be neglected by physicians and pediatricians.

The results of the task force work were similar to some studies on the epidemiology of skin diseases in the pediatric population. In Brazil, a study carried out at a University Hospital in Taubaté also found a higher prevalence of allergic diseases (28%), especially atopic dermatitis, followed by pigmentation disorders (15.9%), infectious (14.4%) and benign tumors (9.5%)[17].

A referral center for dermatology in Switzerland found a higher prevalence of allergic and inflammatory diseases (45.73%) when compared to other dermatoses[18]. Another referral center for pediatric dermatology in South India showed a higher prevalence of infectious diseases (54.5%), with diseases classified as eczema/dermatitis occurring in 8%[19]. A study carried out in Mexico, in a specialized center, the most frequent dermatoses reported were: atopic dermatitis (14.6%), warts (6.6%). %) and acne (5.5%). This same study compared the prevalence of diseases in different periods and concluded that there was a change in the frequency of dermatoses over the decades[20], showing the influence of the environment on skin conditions.

The comparison between epidemiological studies is not simple, as they were carried out in other places, with different environmental and socioeconomic contexts, and also with different methodologies and classifications of skin diseases. However, it is noted that in developed countries there is a higher prevalence of allergic diseases, such as atopic dermatitis, and in developing countries, there is even a higher frequency of infectious diseases[1,3,7,18,21].

In the task force work, infectious diseases (when grouped together) were the second most common skin condition, and viral infections (warts and molluscum contagiosum) were the most prevalent, especially among preschool and school aged groups. Warts and molluscum contagiosum are often found as the main infectious dermatoses in schoolchildren, which can be attributed to the fact that they are contagious diseases, especially in agglomerations, such as in day care centers and schools[4,10,20].

In the present study, there was a predominance of females (59%) and a higher prevalence of preschoolers and schoolchildren, representing 63.2% of the patients referred by Healthcare centers. The prevalence of dermatoses in schoolchildren is quite variable in the literature. In a study carried out in Turkish schools, 79.9% of the students had some kind of skin lesion[4]. In the North of India, 38.8% had some skin disorder[3] and, in Switzerland, 30.9% of the patients treated were schoolchildren, corresponding to the largest group[18]. In this same study, there was a greater predominance of females, as in the publication by Ferreira, Nascimento and Cirvidiu (2011)[17] and Mohammedamin et al (2006)[11].

Bacterial and fungal infections were not as prevalent, this can be understood by the lower prevalence of these diseases among the patients seen or by the non-referral of professionals from the Healthcare Units, who are managing these conditions in primary care. Studies show that there is a difference in the prevalence of skin disorders when comparing the population seen in primary care or in schools and the population of children seen in specialized care[3,22].

In addition to chronic diseases, such as atopic dermatitis, vitiligo and psoriasis, which require follow-up by a specialist, many conditions that require a procedure and/or investigation are referred to tertiary centers. In the task force, we noticed that the group of hyperplasia and benign tumors is also prevalent, demonstrating the concern of family members and primary care physicians regarding this problem, which often require further investigation. Vitiligo was present in 3.5% of the cases in the task force work, a high prevalence when compared to other studies, which found an incidence between 0.8% and 2.16%. Psoriasis was present in a few cases (0.7%), being more prevalent in other studies, between 2 and 3%[3,10,18].

Papulosquamous disorders and vascular lesions appeared in a few cases. It is noted that hemangioma occurred only in girls and infants, confirming the behavior of the disease found in the literature[9].

In the task force, more than half of the patients treated (52.5%) were discharged and 25 (9.6%) were instructed to keep the follow-up at the Healthcare Unit, demonstrating that most dermatoses can be treated in primary care. Eighty-five patients (32.6%) were referred for follow-up in pediatric dermatology and 14 patients (5.3%) to other specialties.

The reasons why the patients in the task force were referred by the pediatric dermatology team were the need for investigation, examinations and biopsies, treatments or procedures, and the need for follow-up due to chronic, recurrent and difficult-to-control disease.

It is important to understand the main reasons for referral to the pediatric dermatology specialty. The publication by Lowell et al (2001)[23] showed that more than 40% of referrals to dermatology occur due to the need for biopsy, lesion excision and evaluation of a suspicious lesion. Other reasons are the need to confirm a suspected diagnosis, failure to respond to treatment and follow-up due to chronic illness.

According to the survey carried out by the Municipal Healthcare Department, there were approximately 2,000 children and adolescents on the waiting list for pediatric dermatology care in 2016, a very high demand, not compatible with the availability of pediatric dermatologist teams in the public healthcare network. Several actions have been carried out to reduce the waiting list, among them, the task forces and communication between primary care professionals and the specialist.

However, the results of the task force and the literature indicate that skin lesions are very common in the pediatric population and that, at some point, the primary care physician, general pediatrician or other specialty doctor will come across a dermatosis. Often the skin lesion is the main complaint, but in other situations, they are physical examination findings; therefore, primary care physicians are responsible for recognizing, managing and treating the most common lesions, as well as identifying situations that require early referral to a specialist.

CONCLUSION

In the pediatric dermatology task force held in November 2016, eczematous diseases were the most prevalent, followed by infectious diseases, benign hyperplasia and neoplasms. Atopic dermatitis was the most common skin disorder in the population served. Among the infectious cases, the viral ones occurred in greater numbers, mainly in the preschool and school aged groups. Among adolescents, acne was the most frequent skin disorder. In the group of benign hyperplasia and neoplasms, nevi were the most often found.

We conclude that the demand for the care of children with skin complaints is high. This emphasizes the need to train professionals in this field and the opening of a greater number of vacancies in centers that provide this type of service. However, more than half of the cases evaluated could be treated by a primary care physician, provided he is knowledgeable about the most prevalent dermatoses, which highlights the importance of teaching pediatric dermatology in medicine, family medicine and pediatrics programs.

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