Etiopathogenic Factors and Clinical Findings of Pityriasis Alba

Pitriyazis Albada Etiyopatojenik Faktörler ve Klinik Bulgular

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ABSTRACT Objective: The etiology and pathogenesis of pityriasis alba (PA) are still poorly understood. The aims of this study were to compare the suspected triggering factors for PA in clinical cases with controls and to analyze clinical features of PA. **Material and Methods:** Thirty-seven consecutive children with PA and 36 sex- and age-matched controls were studied. All subjects were asked to use of soaps when bathing, duration of baths, bath water temperature, weekly frequency of bathing, time of sun exposure and use of sunscreen. All major and minor criteria for the diagnosis of atopic dermatitis were recorded in all subjects. Haematological tests, stool examination, IgE titres, nasal culture and fungal examinations from the lesions were carried out. Statistical significance was determined by the logistic regression analysis for the studied factors between two groups. **Results:** The presence of history of atopy (p= 0.01), over 1 hour sun exposure (p= 0.007), xerosis (p= 0.022), and Dennie-Morgan sign (p= 0.001) were found to be related to PA. There was no association between PA and the remaining factors such as anemia, parasitic infection, nasal culture for *Staphylococcus aureus*, the presence of family history of PA, types of soap for bathing, duration of bathing, weekly frequency of bathing, water temperature of bathing, moisturizer and sunscreen use or the presence of atopic dermatitis. All criteria for atopic dermatitis except xerosis, Dennie-Morgan sign and history of atopy did not demonstrate any association with PA (p> 0.05). **Conclusion:** History of atopy, xerosis, increased amount of sun exposure, and Dennie-Morgan sign may be related to the PA.

Key Words: Dermatitis, atopic; pityriasis

ÖZET Amaç: Pitriyazis alba (PA)'nın etiyolojisi ve patogenezi hala tam olarak anlaşılamamıştır. Bu çalışmanın amacı, PA için şüpheli tetikleyici faktörler açısından hasta ve sağlıklı bireyleri karşılaştırmak ve PA'nın klinik özelliklerini analiz etmektir. **Gereç ve Yöntemler:** Otuz yedi ardışık PA olgusu ile yaş ve cinsiyet açısından eşleştirilmiş 36 sağlıklı çocuk çalışmaya dahil edildi. Tüm olgular, banyoda kullandıkları sabun türü, banyo süresi, banyo suyu sıcaklığı, haftalık banyo sıklığı, güneşe maruziyet süresi ve güneş koruyucu kullanımı açısından sorgulandı. Tüm olgularda atopik dermatit majör ve minör tanı kriterleri kaydedildi. Tüm olgulardan hemogram, dışkıda parazit incelemesi, IgE düzeyi, nazal sürüntü kültürü ve PA lezyonlarından mikotik tetkik istendi. Gruplar arasında araştırılan faktörlerin istatistiksel anlamlılığı lojistik regresyon analizi ile belirlendi. **Bulgular:** Atopi öyküsü (p= 0.01), bir saatten fazla güneşlenme (p= 0.007), kserozis (p= 0.022) ve Dennie-Morgan işareti (p= 0.001) PA ile ilişkili bulundu. Geriye kalan diğer faktörlerden anemi, parazitik enfeksiyon, nazal *Stafilokokus aureus* taşıyıcılığı, ailede PA öyküsü, banyo sabunu türü, banyo süresi, haftalık banyo sıklığı, banyo suyu sıcaklığı, nemlendirici kullanımı, güneş koruyucu kullanımı ve atopik dermatit varlığı PA ile ilişkili bulunmadı (p> 0.05). Kserozis, Dennie-Morgan işareti ve atopi öyküsü dışındaki diğer atopik dermatit tanı kriterleri PA ile ilişki göstermedi (p> 0.05). **Sonuç:** Atopi öyküsü, kserozis, artmış güneş maruziyeti ve Dennie-Morgan işareti PA ile ilişkili olabilir.

Anahtar Kelimeler: Atopik dermatit; pitriyazis alba

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Pityriasis alba (PA) is a common benign skin disease, usually seen in children. It is characterized by asymptomatic, hypopigmented, finely scaling, well-defined oval macules, most commonly settled on the face. PA lesions are relatively common in individuals with darker skin colour.[1,2] The etiology and pathogenesis of PA are still poorly understood. Bacterial, fungal and parasitic infections have been suggested, but no associations have been found.[3,4] Nutritional deficiencies were found to be related with PA.[5] Some authors have proposed that xerosis, atopy, sun exposure, increased number of daily baths involve in the pathogenesis of PA.[6-8] However, there are a limited number of case-controlled studies investigating etiopathogenesis of PA in the literature.[8] The aims of this study were to compare the suspected triggering factors for PA in clinical cases with healthy controls and to analyze the clinical features of the disease.

MATERIAL AND METHODS

Thirty-seven consecutive children with PA, aged 1-16 years attending to our dermatology out patient clinic and 36 sex- and age-matched healthy control subjects within the period of December 2006 to December 2007 were included into the study. Informed consent was obtained from all the parents. The research protocol was approved by the university hospital ethical committee. Diagnosis of PA was made upon physical examination. Skin phototype was determined based on Fitzpatrick's classification[9] and major and minor features of atopic dermatitis were recorded according to Hanifin and Rajka's criteria.[10] The control subjects did not have a clinical history or PA lesions, immunosuppressive treatment or antibiotics. The duration, location, appearance, number and size of the lesions, seasonal exacerbation and family history of PA were recorded. Both the PA patients and controls were asked to use of soaps when bathing, duration of baths, bath water temperature, weekly frequency of bathing, time of sun exposure and use of sunscreen. Routine haematological tests, stool examination for the presence of ova or cyst, IgE titres and nasal culture examination were carried out in all cases. Scraping materials were obtained from PA lesions for the culture of fungus.

Statistical Analysis

Statistical significance was determined by the logistic regression analysis for the studied factors between two groups. p values of less than 0.05 were considered statistically significant. The statistical analysis was carried out using the Statistical Package for the Social Sciences (SPSS) version 16 (SPSS, Chicago, IL, USA).

RESULTS

The features of the PA lesions are shown in Table 1. Seventy-three children participated the study, 37 (16 girls and 21 boys) with PA and 36 controls (17 girls and 19 boys). The mean age in the PA group was 7.43 ± 3.52 years and 7.56 ± 3.41 years in the control group. In PA group, skin phototype 2, 3 and 4 were 6 (16.2%), 30 (81.1%) and 1 (2.7%), respectively. In control group, skin phototype 2 and 3 were 8 (22.2%) and 28 (77.8%) respectively. The difference between the groups in terms of skin pho-

TABLE 1: Main features of the PA lesions.

Feature	n	%
Localization		
Only face	29	78.3
Upper extremities and face	3	8.1
Lower extremities and face	2	5.4
Only lower extremities	3	8.1
Seasonal exacerbation		
Winter	17	45.9
Summer	10	27.0
Unrelated	10	27.0
Type		
Hypopigmented	14	37.8
Scaly hypopigmented	19	51.4
Erythematous scaly hypopigmented	4	10.8
Number		
1-5	31	83.8
6-10	6	16.2
Size		
Up to 5 cm	37	100
> 5 cm	0	0
Duration		
Up to 6 months	18	48.6
6-12 months	10	27.0
> 12 months	9	24.3

totype was not statistically significant (p= 0.511).

The presence of history of atopy (p= 0.01), over 1 hour sun exposure (p= 0.007), xerosis (p= 0.022), and Dennie-Morgan sign (p= 0.001) were found to be related with PA. There was no association between PA and the remaining factors such as anemia, parasitic infection, nasal culture for *Staphylococcus aureus*, the presence of family history of PA, types of soap for bathing, duration of bathing, weekly frequency of bathing, water temperature of bathing, moisturizer and sunscreen use or the presence of atopic dermatitis. All criteria for atopic dermatitis except xerosis, Dennie-Morgan sign and history of atopy did not demonstrate any association with PA (p> 0.05) (Table 2 and 3).

Direct microscopic examination and culture for fungus of the skin scrapings revealed no fungal elements or growth in all PA lesions. Atopic dermatitis was found in 7 (18.9%) of PA patients.

DISCUSSION

Although PA is a common skin condition seen in children, there is only one case-controlled study investigating for the etiopathogenesis of this entity in the literature.[8] The exact mechanism is not clear behind this disorder. The histological appearances of PA lesions are non-specific which involve irregular pigmentation, horny plug, follicular spongiosis and atrophic sebaceous glands.[6,11] Ultrastructural studies proposed that hypopigmentation in PA lesions primarily results from a reduced number of melanocytes and melanosomes.[6]

It has been shown to be a strong connection with xeroderma and PA.[7,8] The present study demonstrated that xerosis is a related factor with PA. The increased frequency of bathing and use of hot water in baths cause xeroderma.[8] However, the logistic regression analysis did not demonstrate any association between PA and personal bathing habits in this study. In the present study, increased (over 1 hour) sun exposure was found to be associated with PA. The mechanisms of the relationship between PA and sun exposure has not been explained with specific photobiological studies. However, the fact that direct ultraviolet radiation trigger of

TABLE 2: Distribution of the suspected factors in aetiology of PA.

	Patients (n= 37)		Controls (n= 36)		
Variable	**n**	**%**	**n**	**%**	***p**
Nasal culture					
S. aureus positive	7	18.9	10	27.8	> 0.05
Anemia	15	40.5	12	33.3	> 0.05
Parasitic infection	4	10.8	1	2.8	> 0.05
Family history for PA	13	35.1	0		> 0.05
Type of soaps					
Daphne soap	23	62.2	17	47.2	> 0.05
Olive oil soap	6	16.2	9	25.0	> 0.05
Shampoo-shower gel	8	21.6	10	27.8	> 0.05
Weekly frequency of bathing					
Over 3	17	45.9	7	19.4	> 0.05
Water temperature of bathing					
Hot	10	27	3	8.3	> 0.05
Duration of bathing					
Over 20 minutes	15	40.5	8	22.2	> 0.05
Amount of sun exposure					
Over 1 hour	29	78.4	11	30.6	**0.007**
Use of sunscreen	4	10.8	4	11.1	> 0.05
Use of moisturizer	9	24.3	1	2.8	> 0.05

PA: Pityriasis alba
* Logistic regression analysis.

TABLE 3: Distribution of study subjects according to criteria of AD.

	Patients		Controls		
Variable	**n**	**%**	**n**	**%**	***p**
Major criteria of AD					
Pruritus	14	37.8	0		> 0.05
Tendency to chronic dermatitis	9	24.3	0		> 0.05
Eczema	5	13.5	0		> 0.05
History of atopy	15	40.5	2	5.6	**0.01**
Minor criteria of AD					
Xerosis	20	54.1	3	8.3	**0.022**
Keratosis pilaris	21	56.8	3	8.3	> 0.05
Hand-foot dermatitis	7	18.9	0		> 0.05
Cheilitis	7	18.9	1	2.8	> 0.05
History of allergic conjunctivitis	5	13.5	0		> 0.05
Dennie-Morgan sign	30	81.1	5	13.9	**0.001**
Infraorbital darkening	7	18.9	1	2.8	> 0.05
Food intolerance	2	5.4	0		> 0.05
Wool intolerance	10	27.0	1	2.8	> 0.05
Pruritus due to perspiration	7	18.9	1	2.8	> 0.05
Elevated serum IgE	10	27.0	10	27.8	> 0.05
Tendency to cutaneous infection	7	18.9	0		> 0.05
White dermographism	11	29.7	1	2.8	> 0.05

* Logistic regression analysis.

PA may be explained by its' drying effect on skin.

There is no data on role of genetic factors in the etiopathogenesis of PA. We also could not find any association between the presence of family history of PA and PA.

Atopic diathesis has been reported as a predisposing factor for PA.[4,8,12] However, in the present study, regarding atopic dermatitis criteria, only two of minor criteria (xerosis and Dennie-Morgan sign) and one of major criteria (history of atopy) demonstrated significantly association with PA. Atopic dermatitis was found in 18.9% of PA patients in our study. Also, the presence of atopic dermatitis did not show an association with PA. It is well known a tendency to cutaneous infections in patients with atopic dermatitis. In our study, seven (18.9%) PA patients had demonstrated verruca plana or verruca vulgaris. However, the logistic regression analysis did not demonstrate any association between the presence of verruca infection and PA.

Inanir et al reported that PA, keratosis pilaris and xerosis are the most common eczematoid conditions in primary school children. They also indicated that PA may be related to poor socioeconomic status and intestinal parasitosis.[13] Bassaly et al suggested that nutritional deficiency, anemia and parasitic infestations are contributing factors for PA.[4] Vinod et al reported that low growth profile and signs of nutritional deficiencies were seen in only 2% of PA patients. They found that 16.5% of patients had anemia, 15.5% of patients had parasitic infection. However, they did not find any relationship between bacterial or fungal cultures and PA.[3] Galadari et al showed that PA patients have lower serum levels of copper.[5] Blessmann Weber et al found no relationship between nasal *S. aureus* carriage and PA.[8] We also failed to detect any association between anemia, parasitic infection or nasal culture for *S. aureus* and PA.

In the present study, the clinical findings such as localization (mostly face), type (mostly scaly hypopigmented), number (mostly up to 5) and size (all up to 5 cm) of the PA lesions were similar to the previous two studies.[3,8] In our study, exacerbation of the lesions during winter was observed in 45.9% of patients, whereas Vinod et al reported that 63.5% of the patients had no seasonal exacerbation.[3] Blessmann Weber et al. reported that 57.4% of the patients had summer exacerbation.[8] We observed that 48.6% of the patients had lesions of less than six months duration. However, Vinod et al. and Blessmann Weber et al reported that 84.5% and 35.2% of the patients had lesions of less than six months duration, respectively.[3,8]

CONCLUSION

In this case-controlled study, we found that xerosis, Dennie-Morgan sign, history of atopy and increased amount of sun exposure are related to the PA. The management of xerosis and prevention of sun exposure may be essential to decrease the development of PA.

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