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Association between Pityriasis Rosea and Atopy

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Abstract

Background: Pityriasis rosea (PR) is a common, self-limiting, inflammatory papulosquamous skin disease. Although the exact pathogenesis of PR remains unknown, many studies have established a role for systemic active human herpesvirus (HHV) 6 and HHV-7 infection in the pathogenesis of PR based on the detection of HHV-6 and HHV-7 DNA in plasma and by electron microscopy in skin lesions PR.

Aim of Study: To examine if pityriasis rosea is associated with atopy.

Patients and Methods: A case control study was done to examine association between pityriasis rosea and atopy. The study included 40 patients diagnosed clinically with pityriasis rosea. All patients were attending at dermatology outpatient clinic at El-Demerdash Hospital Ain Shams University. The work was done between 1 st of November 2021 and 15 th of July 2022.

Results: Our study showed no significant difference between cases and controls regarding personal or family history of atopy, atopic dermatitis or total IgE levels. Furthermore, there was also no significant difference between cases and controls regarding age or sex. Skin Prick Test however showed not only a significant difference between cases and controls regarding number of allergens, with 48.8% of controls having 3 or more allergens compared to 16.1% of cases but also regarding the type of allergen where candida was found to be the commonest allergen among controls (40%) compared to 17.7% of cases.

Conclusion: The association between pityriasis Rosea and atopy is yet to be identified and further investigated.

Key Words: *Pityriasis rosea – Atopy – Skin prick test.*

Introduction

PITYRIASIS rosea is an inflammatory papulosquamous skin disease that may have a negative impact on quality of life in patients **[1]**.

The exact pathogenesis of PR remains unclear, many studies have established a causal role for systemic active human herpesvirus (HHV) 6 and HHV-7 infection in the pathogenesis of PR based on the detection of HHV-6 and HHV-7 DNA in plasma and expression of mRNA and specific antigens in skin lesions of patients with PR.

In addition, herpesviruses were detected by electron microscopy in skin lesions and in the peripheral blood mononuclear cells from patients with PR **[2,3]**.

Numerous hypotheses have been postulated about the exact cause of PR, incriminating both infective agents such as viruses, bacteria, spirochetes, and non-infective etiologies such as atopy and autoimmunity **[4]**.

Atopy describes the tendency of a given individual to mount immunoglobulin E (IgE) antibody responses against otherwise harmless antigens (allergens). The clinical consequence of this is the propensity to develop hypersensitivity reactions to allergens. Allergic bronchial asthma and allergic rhinitis are the most common manifestations of atopy followed by atopic dermatitis and food allergy **[5]**.

Aim of the work:

The purpose of this study was to examine the association between pityriasis rosea and atopy by comparing a group of clinically diagnosed pityriasis rosea patients and a control group of healthy individuals regarding atopic personal & family history and atopic manifestations. Furthermore, measuring IgE levels, applying Hanifin and Rajka criteria of atopic dermatitis and conducting skin prick tests to detect reactivity to various environmental and food allergens.

Patients and Methods

A case control study was done to examine association between pityriasis rosea and atopy. The

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study included 40 patients diagnosed clinically with pityriasis rosea. All patients were attending at dermatology outpatient clinic at El-Demerdash Hospital Ain Shams University. A group of 50 healthy subjects from the general population (friends and relatives of patients attending outpatient clinics at Eldemerdash Hospital Ain Shams University) were included as a control group in the study. The work was done between 1st of November 2021 and 15th of July 2022.

Patients diagnosed clinically with classic type of pityriasis rosea by a medical practitioner by detailed history and typical clinical findings were enrolled in the study while patients with other dermatological disease such as fungal infection, secondary syphilis, eczema or psoriasis were excluded from the study.

All patients were subjected to history taking, clinical examination with special emphasis on careful general examination and search for clinical manifestations suggestive of systemic disease, local examination: Complete dermatological examination to assess involvement and the extent of the disease, and applying Hanifin and Rajka criteria for diagnosis of atopic dermatitis.

Skin prick test was done to all patient and control group using different allergens with positive control (histamine) and negative control (saline).

Blood samples were obtained from the patients and controls, where total IgE was measured using ELISA test system.

According to the manufactural kit used, total IgE level above 150 IU/ml is considered susceptible to have allergy or atopy.

Statistical analysis:

All data were collected, tabulated and statistically analyzed using SPSS 22.0 for windows (SPSS Inc., Chicago, IL, USA) & Med Calc 13 for windows (Med Calc Software bvba, Ostend, Belgium). Data were tested for normal distribution using the Shapiro Walk test. Qualitative data were represented as frequencies and relative percentages. Quantitative data were expressed as mean ± SD (Standard deviation). Then the appropriate statistical analyses were applied.

Results

There was no significant difference between cases and controls regarding age > 18 years and <18 years (Table 1).

Table (1): Comparison between cases and controls regarding age.

	Group				*p*	Sig.
	Case		Control			
	Mean	±SD	Mean	±SD		
Age (Y)	21.60	10.86	23.30	9.50	0.431‡	NS
Age group:						
Adult > 18	24	60.0%	38	76.0%	0.161*	NS
Children <18	16	40.0%	22	24.0%		

‡Student *t*-test.
*Chi-Square Tests.

There was no significant difference between cases and controls as regard family history or clinical symptoms (Table 2).

Table (2): Comparison between cases and controls as regard family history/clinical symptoms.

	Case		Control		*p*	Sig.
	n	%	n	%		
Family history of atopy	12	30	15	30	1.0*	NS
Pruritis	7	18	5	10	0.29*	NS
Flexural/face dermatitis in adult & extensors in infant	1	3	5	10	0.22**	NS
Chronic relapsing dermatitis	12	30	9	18	0.18*	NS

*Chi-Square Tests.
**Fisher's Exact Test.

There was no significant difference between cases and controls regarding xerosis (Table 3).

Table (3): Comparison between cases and controls regarding xerosis.

	Group				*p*	Sig.
	Case		Control			
	n	%	n	%		
Xerosis:						
Yes	29	72.5	37	74.0	0.939*	NS
No	11	27.5	23	26.0		

*Chi-Square Tests.

There was no significant difference between cases and controls regarding total IgE levels or atopic dermatitis (Table 4).

Table (4): Comparison between cases and controls as regard clinical characteristics.

	Group						*p*	Sig.
	Case			Control				
	Mean	±SD	Median (IQR)	Mean	±SD	Median (IQR)		
Total IgE	84.75	113.74	35. (25-97)	77.50	102.17	40 (25-80)	0.870‡	NS
Total IgE category:								
<150	33	82.5%		42	84.0%		0.850*	NS
=>150	7	17.5%		8	16.0%			
Major criteria of atopic dermatitis:								
0	18	45.0%		24	48.0%		0.777*	NS
1	17	42.5%		22	44.0%			
3	5	12.5%		4	8.0%			
Minor criteria of atopic dermatitis:								
0	4	10.0%		2	4.0%		0.494**	NS
1	14	35.0%		15	30.0%			
2	13	32.5%		23	46.0%			
3	9	22.5%		10	20.0%			
Atopic dermatitis:								
Negative	36	90.0%		47	94.0%		0.695**	NS
Positive	4	10.0%		3	6.0%			

‡Mann-Whitney test. *Chi-Square Tests. **Fisher's Exact Test.

There was no significant difference between cases and controls regarding Skin Prick Test reactivity, however a significant difference was found between cases and controls regarding number of allergens, with 48.8% of controls having 3 or more allergens compared to 16.1% of cases (Table 5).

Table (5): Comparison between cases and controls regarding skin prick test and number of allergens.

	Group				*p*	Sig.
	Case		Control			
	N	%	N	%		
Skin prick test:						
Negative	9	22.5	9	18.0	0.596*	NS
Positive	31	77.5	41	82.0		
Number of allergens:						
1.00	11	35.5	4	9.8	0.01**	HS
2.00	15	48.4	17	41.5		
3.00	4	12.9	15	36.6		
4.00	1	3.2	5	12.2		
Number of allergens:						
< 3	26	83.9	21	51.2	0.004*	HS
=>3	5	16.1	20	48.8		

*Chi-Square Tests. **Fisher's Exact Test.

There was no significant difference between cases and controls regarding allergen reactivity except for candida) which was the leading allergen among controls (40%) compared to 17.7% of cases (Table 6).

Table (6): Comparison between cases and controls regarding allergen reactivity.

	Case		Control		*p*	Sig.
	N	%	N	%		
Candida	7	17.5	20	40.0	0.021*	S
Mixed pollen	6	15.0	9	18.0	0.704*	NS
Moulds	8	20.0	9	18.0	0.810*	NS
House dust mites	9	22.5	14	28.0	0.552*	NS
Pigeon feather	4	10.0	2	4.0	0.4**	NS
Hay dust	1	2.5	1	2.0	1.0**	NS
Wool	4	10.0	8	16.0	0.405*	NS
Straw dust	3	7.5	2	4.0	0.652**	NS
Eggs	5	12.5	6	12.0	1.0**	NS
Fish	3	7.5	3	6.0	1.0**	NS
Mango	0	0.0	2	4.0	0.126**	NS
Strawberry	1	2.5	1	2.0	1.0**	NS
Milk	0	0.0	4	8.0	0.126**	NS
Wheat	0	0.0	4	8.0	0.126**	NS
Cat hair	3	7.5	4	8.0	1.0**	NS
Dog hair	2	5.0	1	2.0	0.583**	NS
Nuts	1	2.5	5	10.0	0.221**	NS

*Chi-Square Tests. **Fisher's Exact Test.

Discussion

Pityriasis rosea (PR) is a common, self-limiting, inflammatory papulosquamous skin disease that may have a negative impact on quality of life in patients **[1]**.

Although the exact pathogenesis of PR remains unknown, many recent studies have established a role for systemic active human herpesvirus (HHV)

6 and HHV-7 infection in the pathogenesis of PR based on the detection of HHV-6 and HHV-7 DNA in plasma and by electron microscopy in skin lesions PR [2,3].

Numerous hypotheses have been postulated about the exact cause of PR, incriminating both infective agents such as viruses, bacteria, spirochetes, and noninfective etiologies such as atopy and autoimmunity [4].

Due to the sparcity of studies investigating the non-infectious pathogenesis of PR and the possible association with atopy in the last decades and the total absence of similar studies in our geographical region and ethnicity, we conducted this study to examine the association between pityriasis rosea and atopy by comparing a group of clinically diagnosed pityriasis rosea patients and a control group of healthy individuals regarding atopic personal & family history and atopic manifestations. Furthermore, measuring IgE levels, applying Hannifin and Rajka criteria of atopic dermatitis and conducting skin prick tests to detect reactivity to various environmental and food allergens.

A previous case-control study reported relatives of patients with PR to have a higher incidence of asthma and eczema [6].

A population-based study conducted on 939 patients with PR reported that 16% had a personal history of asthma, Rhinitis or atopic dermatitis [7]. Subsequently every third patient from 747 of these 939 patients, for whom clinical records were available, was randomly selected with the resulting identification of 249 cases. Comparing them with 249 paired controls, they found that 14% of patients with PR and 12% of controls had atopy of any type, and that 7% of patients with PR and 4% of controls had asthma (p=0.29) with no resulting statistical significance [8].

This is consistent with our study which also showed no significant difference between cases and controls regarding personal or family history of atopy, atopic dermatitis or total IgE levels.

Skin Prick Test however showed not only a significant difference between cases and controls regarding number of allergens, with 48.8% of controls having 3 or more allergens compared to 16.1% of cases but also regarding the type of allergen where candida was found to be the commonest allergen among controls (40%) compared to 17.7% of cases.

Conclusion:

The association between pityriasis rosea and atopy is yet to be identified and further investigated. Further studies are needed and recommended with larger sample sizes, older age groups, atopic provocation tests and long-term follow-up for better understanding of the association between pityriasis rosea and atopy.

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الإرتباط بين النخالة الوردية والداء التأتبى
دراسة الحالات والشواهد

الخلفية : النخالة الوردية (PR) هى طفح جلدى حاد مسبباته المرضية غير معروفة، على الرغم من هذه الحقيقة تعتبر العوامل المعدية هى المسئولة عن الإصابة بها ومن أكثر هذه العوامل هى فيرس الهربس (HHV-6, HHV-7)، ولكن هناك أيضاً دراسات تشير إلى أنه عامل نشط ومنظم ومعدى. تم اقتراح العديد من الفرضيات كعوامل معدية مثل الفيروسات والبكتيريا واللولبيات والمسببات المرضية غير المعدية مثل التأتب والمناعة الذاتية.

الهدف من البحث : الغرض من هذه الدراسة هو فحص العلا قة بين النخالة الوردية والتأتب من خلال مقارنة مجموعة من مرضى النخالة الوردية الذين تم تشخيصهم سريرياً ومجموعة مراقبة من الأفراد الأصحاء فيما يتعلق بالتاريخ التأتبى الشخصى والعائلى والمظاهر التأتبية.

المرضى وطرق البحث : تم إجراء دراسة الحالة لفحص الارتباط بين النخالية الوردية والتأتب. شملت الدراسة ٤٠ مريضاً تم تشخيصهم إكلينيكياً بالنخالية الوردية. كان جميع المرضى يحضرون إلى العيادة الخارجية للأمراض الجلدية بمستشفى الد مرداش بجامعة عين شمس.

النتائج : أظهرت دراستنا عدم وجود فرق كبير بين الحالات والضوابط فيما يتعلق بالتاريخ الشخصى أو العائلى للتأتب والتهاب الجلد التأتبى أو إجمالى مستويات IgE، علاوة على ذلك لم يكن هناك فرق كبير بين الحالات والشواهد فيما يتعلق بالعمر أو الجنس. أيضاً أظهر اختبار وخز الجلد ليس فقط اختلافاً كبيراً بين الحالات والشواهد فيما يتعلق بعدد المواد المسببة للحساسية، حيث إن ٤٨.٨٪ من المجموعة الضابطة بها ٣ أو أكثر من مسببات الحساسية مقارنة بـ ١٦.١٪ من الحالات، ولكن أيضاً فيما يتعلق بنوع مسببات الحساسية حيث وُجد أن الكانديدا هى الأكثر شيوعاً فى مسببات الحساسية بين مجموعة الشواهد (٤٠٪) مقابل ١٧.٧٪ من الحالات.

الخلاصة : لم يتم تحديد العلاقة بين النخالية الوردية والتأتب بعد. والعلاقة بينهما تحتاج إلى دراسات أخرى.