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Erectile dysfunction and associated factors in males with psoriasis: a case-control study

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Availability of data and materials: all data used to support the findings of this study are included within the article. Moreover, the Excel data used to support the findings of this study are available from the corresponding author upon request.

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Abstract

Psoriasis is a chronic inflammatory skin disease associated with multiple comorbidities, including erectile dysfunction (ED). Data on the sexual health of male psoriasis patients in Vietnam are limited. We investigated the ED prevalence and severity in male psoriasis patients *vs.* healthy individuals and explored potential associations between ED and clinical characteristics of psoriasis. This case-control study included 135 male psoriasis patients and 166 healthy individuals aged ≥18 years and limited to those sexually active within the last 6 months. The 5-item version of the International Index of Erectile Function (IIEF) was used to assess ED risk and severity. Psoriasis patients demonstrated a higher prevalence of ED than controls (80.7% *vs.* 67.5%, p=0.01), with increased risk of moderate-to-severe ED. Age, obesity, age of psoriasis onset, Dermatology Life Quality Index (DLQI), Psoriasis Area Severity Index (PASI), and genital lesions were associated with ED. Advanced age and elevated PASI scores were independent risk factors for ED ($p<0.05$). Hence, psoriasis is a risk factor for ED. Additionally, ED may serve as an early indicator of cardiovascular risk in male patients with psoriasis.

Introduction

Psoriasis is a chronic inflammatory skin disease affecting an estimated 1.5% to 2% of the population in industrialized countries.[1] It is associated with a higher prevalence of comorbidities, such as metabolic syndrome, atherosclerosis, diabetes, and psychological disorders, which affect the quality of life of psoriasis patients. Various psychological issues, including sexual dysfunction, anxiety, depression, and even suicidal ideation, are also linked to psoriasis.[2,3]

Erectile dysfunction (ED) is defined as the persistent inability to achieve and maintain an erection sufficient for satisfactory sexual intercourse.[4] The severity of ED is classified as mild to severe, according to the International Index of Erectile Function (IIEF).[5] Organic ED (*i.e.*, with an underlying physical etiology) and coronary artery disease (CAD) are closely linked, as both result from endothelial dysfunction, leading to restricted blood flow.[6,7]

In Vietnam, although multiple studies have examined the quality of life in psoriasis patients, there remains a significant lack of published research on their sexual health. To address this gap, our study aims to investigate the prevalence and risk of ED in Vietnamese men with psoriasis and to identify key factors contributing to the development of ED in these patients.

Materials and Methods

Setting and participants

From February 2024 to September 2024, we conducted a case-control study, collecting data from 135 male patients with psoriasis and 166 healthy men visiting the Ho Chi Minh City Hospital of Dermato-

Venereology. All participants were over 18 years old and had been sexually active within the last 6 months.

The exclusion criteria for both groups included the presence of coronary heart disease, cerebrovascular events, peripheral vascular disease, psychotic disorders, hypertension, diabetes, renal failure, chronic obstructive pulmonary disease, or the use of medications that could induce ED. Patients with conditions potentially associated with ED, such as hormonal imbalances, pudendal nerve dysfunction, testicular, prostate, or penile conditions, or a history of spinal fractures or surgeries, were also excluded.

Clinical assessment

For patients with psoriasis, data were collected on epidemiological characteristics, clinical features, the Dermatology Life Quality Index (DLQI), Psoriasis Area and Severity Index (PASI), and treatment history. In both groups, information was gathered on age, socioeconomic status, and the 5-item version of the IIEF. The IIEF-5, consisting of five questions, assesses the severity of ED by evaluating key domains of male sexual function, including erectile function, orgasmic function, sexual desire, intercourse satisfaction, and overall satisfaction.

Diagnostic criteria

Plaque psoriasis is typically diagnosed in a clinical setting. The skin lesions associated with psoriasis generally exhibit at least one of the following features: well-demarcated borders, predilection for extensor surfaces of the limbs, symmetrical distribution, positive Auspitz sign, or thick, silvery-white scales. The IIEF-5 provides information on the severity of ED, with scoring ranges as follows: 22-25 = no ED; 17-21 = mild ED; 12-16 = mild-moderate ED; 8-11 = moderate ED; and 5-7 = severe ED.

Statistical analysis

Qualitative data were summarized as frequencies and percentages, while quantitative data were expressed as means and standard deviations (SD) for normally distributed data or as medians and interquartile ranges (IQR) for non-normally distributed data. The Shapiro-Wilk test was applied to assess normality of quantitative data. Group comparisons were made using the Student's *t*-test for normally distributed data and the Mann-Whitney U test for non-normally distributed data. The chi-squared test was used for categorical variables. Multivariate logistic regression was conducted to identify independent risk factors for ED. Statistical significance was set at $p<0.05$. Data analysis was performed using SPSS version 20.

Results

A total of 135 patients with psoriasis and 166 controls participated in the study (Table 1). The two groups were comparable in terms of age and socioeconomic status. The average age at psoriasis onset was 32.28±11.98 years, and 52.6% of patients with psoriasis were classified as obese.

Association between psoriasis disease status and ED

Patients with psoriasis had a significantly higher prevalence of ED (IIEF-5 <22) than controls (80.7% *vs.* 67.5%, p=0.01), with a 2.021-fold increased risk of developing ED (Table 1). Additionally, these patients exhibited more severe ED, as shown by a significantly lower mean IIEF-5 score than controls (16.5±5.13 *vs.* 18.42±4.61, p=0.001). The risk of moderate and severe ED was also significantly higher in patients with psoriasis, with an 8.308-fold and 7.615-fold increased risk, respectively, than controls (Table 1).

Association of psoriasis characteristics with ED

In patients with psoriasis, factors such as age, obesity, age at psoriasis onset, DLQI scores, PASI scores, and the presence of genital lesions were significantly associated with ED occurrence ($p<0.05$). In contrast, no significant differences were observed between patients with and without ED concerning address, educational level, employment status, socioeconomic status, physical activity, tobacco or alcohol use, family history of psoriasis, disease duration, or psoriasis treatment (Table 2). Using multivariate logistic regression, advanced age and elevated PASI scores were identified as independent risk factors for ED in male patients with psoriasis ($p<0.05$) (Table 3).

Discussion

This study aimed to assess the prevalence and severity of ED in male patients with psoriasis compared with healthy controls and to identify clinical factors associated with ED in this population. Our findings indicate that psoriasis is significantly associated with a higher prevalence of ED. Specifically, 80.7% of patients with psoriasis experienced ED compared with 67.5% in the control group. These patients had a two-fold increase in the odds of having ED and more severe forms of ED compared with controls, regardless of age or socioeconomic factors. The prevalence of ED risk in male patients with psoriasis in our study was higher than that reported in Portugal (61.5%) and the UK (58%).[8,9] However, it was similar to the rate observed in Turkish men with psoriasis (81.08%).[10] Despite these variations, all studies consistently support a significant association between psoriasis and ED ($p<0.05$).

The inflammatory nature of psoriasis, along with its psychosocial impact, likely contributes to ED. Psoriasis is a chronic inflammatory condition, and ongoing release of interleukins can lead to blood vessel changes and the development of atherosclerotic plaques, which are major contributors to both cardiovascular disease and ED. Chronic inflammation also impairs endothelial function, with smaller blood vessels, such as those supplying the penis, often affected before larger vessels such as the coronary arteries, making ED an early indicator of cardiovascular complications. Typically, ED is not only a sexual health issue but also an early warning sign of cardiovascular disease. The time interval between the onset of ED symptoms and the occurrence of CAD symptoms and cardiovascular events is estimated at 2-3 years and 3-5 years, respectively.[11] Additionally, ED is more prevalent in patients with obesity ($p<0.05$). Improvements in cardiovascular risk factors, such as weight loss and increased physical activity, have been shown to enhance erectile function (Level 1, Grade A).[11] Finally, genital lesions in patients with psoriasis are significantly associated with an increased risk of ED, underscoring the dual impact of physical discomfort and psychological stress caused by psoriasis in sensitive areas.

Multivariate regression analysis identified advanced age and elevated PASI scores as independent risk factors for SD in men with psoriasis. Previous studies have also highlighted that age and PASI scores are significant risk factors for ED. Lower serum androgen levels in aging men have been extensively documented, with histological studies showing a significant reduction in the number and volume of Leydig cells in aging men. The Massachusetts Male Aging Study reported a 20% prevalence of hypogonadism in men older than 55 years, with the total testosterone levels being less than the normal rate for young, healthy subjects.[12] In their longitudinal study, Harman *et al.* reported on a relatively high number of older men with decreasing total testosterone levels with increasing age.[13] Kedra *et al.* found a significant correlation between PASI scores and ED severity ($r=0.2$, $p=0.04$), indicating that higher PASI scores are associated with an increased risk of ED in male patients with psoriasis.[14] Meeuwis noted that sexual activity is compromised in 25% of patients with psoriasis, with common reasons including the negative impact of psoriasis on physical appearance, decreased sexual desire, and embarrassment from scaling and topical treatments.[15] Thus, as the PASI score increases, the risk of reduced libido and chronic dysfunction also rises, due to factors such as chronic inflammation, pain, itching, and psychological impacts, which can negatively affect sexual function.

The impact on patients' quality of life is reflected in the DLQI. Psoriasis patients with ED had significantly lower DLQI scores than those without, underscoring the negative impact of ED on their overall well-being. DLQI questions revealed strong associations between ED and symptoms like itching, pain, soreness, and burning, with an odds ratio (OR) of 2.765 (95% confidence interval [CI]:

1.153-6.630), indicating that patients with ED are more likely to experience these symptoms. Similarly, difficulties in sexual activity were strongly linked to ED, with an OR of 3.449 (95% CI: 1.340-8.879). Social and interpersonal issues were also significantly associated with ED, with an OR of 2.456 (95% CI: 1.020-5.912).

A study by Nowowiejska *et al.* highlighted that symptoms like itching and burning can impair sexual function in women by reducing physical attractiveness and sexual desire, especially when lesions are in the genital area.[16] In patients with lichen simplex chronicus (a condition characterized by intense, persistent itching), the risk of ED was found to be 1.74 times higher than in those without the condition (95% CI: 1.44-2.10).[17] Compared with other studies in Vietnam and globally, research on the relationship between itching and ED in male patients with psoriasis remains limited. Our study, therefore, plays a pioneering role in providing foundational data for future research on the link between itching and sexual dysfunction.

The severity of ED can be assessed using quality of life tools such as the DLQI (question 9: "Over the past week, has your skin caused difficulties with sexual activity?"). However, these tools rely on self-assessment over the past 7 days, whereas ED is typically diagnosed when it persists for 3-6 months. Accurate evaluation requires specialized questionnaires focused on male sexual health. Our study found that 89.7% of those who answered "yes" to question 9 in the DLQI had ED, compared with 10.3% without ED. This difference was statistically significant ($p<0.05$), suggesting that question 9 may serve as an initial screening tool for ED in patients with psoriasis.

Despite the valuable insights gained from this study, there are several limitations that warrant discussion. First, the case-control nature of this study limits the ability to establish causality between psoriasis and ED. Longitudinal studies are needed to better understand the temporal relationship between these conditions. Additionally, while we adjusted for several potential confounders in our analysis, residual confounding factors, such as psychological stress or undiagnosed metabolic conditions, may still be present. Lastly, the use of self-reported data for sexual function may introduce reporting bias, although the IIEF-5 is a well-validated tool for assessing ED.

Conclusions

An important clinical takeaway from our findings is the need for healthcare providers to address sexual dysfunction in patients with psoriasis more proactively. While some clinicians may be hesitant to discuss ED in a clinical setting due to concerns about patient discomfort, our experience suggests that, when approached with sensitivity and openness, patients are generally receptive to these discussions. This is particularly true given that many patients, including older individuals, continue to engage in sexual activity or at least express interest in maintaining sexual health. These findings

highlight the importance of not making assumptions about a patient's needs, as such assumptions can lead to gaps in care and reduced quality of life for the patient.

Moreover, because ED often serves as an early indicator of CAD, its early detection not only has implications for improving sexual health but also offers significant benefits for cardiovascular risk prevention. The use of the IIEF-5, initiated when a patient responds "yes" to question 9 of the DLQI, can be an effective way to screen for ED early and guide further clinical intervention.

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Table 1. Comparison of age, socioeconomic characteristics, and ED between patients with psoriasis and the control group.

	Psoriasis (n=135)	**Controls (n=166)**	**p-value**	**OR (95% CI)**
Age (years), mean±SD	45.07±12.226	44.64±11.821	0.754*	
Socioeconomic status, %				
Wealthy	3.7	5.4	0.170**	
Sufficient	84.4	88.6		
Struggling	11.9	6.0		
ED assessment				
IIEF-5, mean±SD	16.5±5.132	18.42±4.61	0.001*	
With ED, %	80.7	67.5	0.01**	2.021 (1.181-3.458)
ED severity, %				
Severe	8.1	1.8	0.003**	7.615 (1.955-29.660)
Moderate	11.9	2.4	<0.001**	8.308 (2.524-27.345)
Mild-moderate	26.7	30.1	0.214**	
Mild	34.1	33.1	0.076**	
No ED	19.3	32.5		1

OR, odds ratio; CI, confidence interval; SD, standard deviation; ED, erectile dysfunction; IIEF-5, International Index of Erectile Function-5-item version; *p-value extracted from *t*-test; **p-value extracted from chi-square test.

Table 2. Comparison of characteristics among psoriasis patients with and without ED.

	Patients with ED (n=109; 80.7%)	**Patients without ED (n=26; 19.3%)**	**p-value**	**OR (95% CI)**
Age, years (mean±SD)	46.87±12.542	37.54±6.97	<0.001*	
Socioeconomic status, %				
Wealthy	40.0	60.0	0.083**	
Sufficient	81.6	18.4		
Struggling	87.5	12.5		
Address, %				
Urban	77.8	22.2	0.217**	
Rural	86.7	13.3		
Educational level, %				
Primary School	66.7	33.3	0.107**	
Secondary School	93.3	6.7		
High School	83.3	16.7		
College or University	71.2	28.8		
Postgraduate	85.7	14.3		
Employment status, %				
Unemployed	92.9	7.1	0.068**	
Employed	77.6	22.4		
Physical activity, %				
None or irregular	84.0	16.0	0.563**	
Regular, once per week	83.3	16.7		
Regular, >1 time/week	76.4	23.6		
Smoking status, %				
Never	78.8	21.2	0.414**	
Former	70.6	29.4		
Occasional	90.5	9.5		
Daily	88.2	11.8		

Alcohol consumption, %				
None	91.7	8.3	0.063**	
Once a month	68.6	31.4		
2-4 times/month	81.8	18.2		
2-3 times/week	71.4	28.6		
>3 times/week	80	20		
Family psoriasis history, %				
Yes	69.7	30.3	0.064**	
No	84.3	15.7		
Age of psoriasis onset, years (mean±SD)	34.12±12.139	24.58±7.522	<0.001*	
Disease duration, years (mean±SD)	12.75±9.024	12.96±7.876	0.914*	
Psoriasis treatment, %				
Topical therapy	71.4	28.6	0.057**	
Conventional systemic therapy	88.7	11.3		
Phototherapy	100	0		
Biologic therapy	70.8	29.2		
Genital lesions, %				
Yes	89.1	10.9	0.041**	2.722 (1.014-7.306)
No	75.0	25.0		
Obesity, %				
Yes	87.3	12.7	0.041**	2.492 (1.021-6.083)
No	73.4	26.6		
DLQI total score (mean±SD)	10.87±8.305	4.65±4.242	<0.001*	
10 items in DLQI, %				
Q1. Sore, itchy, painful				
Yes	86.9	13.1	0.02**	2.765 (1.153-6.630)
No	70.6	29.4		
Q2. Embarrassment/sad				
Yes	85.5	14.5	0.249**	
No	77.5	22.5		
Q3. Shopping/housework				
Yes	81.8	18.2	0.792**	
No	80.0	20.0		
Q4. Clothes/shoes				
Yes	87.5	12.5	0.059**	
No	74.6	25.4		
Q5. Social activities				
Yes	84.4	15.6	0.309**	
No	77.5	22.5		
Q6. Sports/entertainment				
Yes	88.7	11.3	0.06**	
No	75.6	24.4		
Q7. Work/study				
Yes	89.6	10.4	0.053**	
No	75.9	24.1		
Q8. Interpersonal problems				
Yes	86.8	13.2	0.041**	2.456 (1.020-5.912)
No	72.9	27.1		
Q9. Sexual difficulties				
Yes	89.7	10.3	0.008**	3.449 (1.340-8.879)
No	71.6	28.4		
Q10. Treatment difficulties				
Yes	86.0	14.0	0.285**	

No	78.3	21.7		
PASI, median (IQR)	11.10 (3.35-17.45)	2.5 (0.8-5.48)	<0.001***	

ED, erectile dysfunction; OR, odds ratio; CI, confidence interval; SD, standard deviation; IQR, interquartile range; *p-value extracted from t-test; **p-value extracted from chi-square test; ***p-value extracted from Mann-Whitney U test.

Table 3. Multivariate logistic regression analysis of potential factors associated with ED.

	p-value	**OR (95% CI)**
Age	0.045	1.082 (1.002-1.139)
Age of psoriasis onset	0.239	
Genital lesions	0.623	
Obesity	0.08	
DLQI	0.235	
Sore, itchy, painful	0.387	
Interpersonal problems	0.083	
Sexual difficulties	0.383	
PASI	0.004	1.276 (1.082-1.505)

OR, odds ratio; CI, confidence interval; DLQI, Dermatology Life Quality Index; PASI, Psoriasis Area Severity Index.