

Original Research

Effects of psoriasis and metabolic syndrome on male sexual functions

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Abstract

Background and Objective: Psoriasis is a chronic inflammatory systemic skin disease triggered by psychological, genetic and environmental factors. The effect of psoriasis on sexual health has not been fully elucidated. Coexistence of psychiatric disorders also affects negatively the life quality of psoriasis patients. This study investigates the relationship between the severity of the current illness, psychosocial health problems and coexisting metabolic syndrome on sexual health in male patients with psoriasis.

Materials and methods: 52 male patients diagnosed with psoriasis and 50 healthy men included for the study. Patient groups Psoriasis Area Severity Index (PASI) and The Dermatology Life Quality Index (DLQI) were tested, subsequently International Index of Erectile Function (IIEF), Hamilton Rating Scale for Depression (HAM-D) tests and Metabolic syndrome (MetS) were reported for both groups. Eventually, the patient groups treatments were recorded.

Results: IIEF, HAM-D scores and MetS were significantly different between the two groups ($P = 0.017$, $P = 0.005$, $P = 0.009$). IIEF score had a significant negative correlation with age, HAM-D and PASI scores ($r = -0.405$, -0.217 and -0.394 , $P = 0.028$, 0.043 and 0.014). It is seen that the frequency and severity of ED increased with methotrexate treatment.

Conclusion: It is showed that psoriasis has negative effects on male sexual health in this study. Our opinion of the reason is the natural course of the disease, its coexistence with diseases such as metabolic syndrome and depression, and the agents used in its treatment.

Keywords

Psoriasis; Erectile dysfunction; Metabolic syndrome

1. Introduction

Psoriasis is a chronic inflammatory systemic skin disease triggered by psychological, genetic and environmental factors. The prevalence of psoriasis reported worldwide varies between 0.09% and 11.43% [1]. Examples of environmental factors that can cause psoriasis are trauma and ultraviolet exposure. Patient related factors are infections, endocrinological diseases, stress, drugs, alcohol and cigarette addiction.

In addition to many comorbidities such as diabetes mellitus, atherosclerotic disease, metabolic syndrome and depression have also been associated with psoriasis [2].

Erectile dysfunction (ED) is the inability to achieve or maintain sufficient penile erection for sexual intercourse [3]. ED is a disease that impairs sexual functions and reproduction. One of the most commonly used forms in patients with sexual dysfunction is the IIEF. IIEF questions 5 issues related to sexual dysfunctions in male patients. It provides

sufficient information about the patient's ability to reach and maintain sufficient erection for sexual intercourse, the degree of satisfaction and the reliability of the treatment.

In a pioneering study conducted in 1997, erectile dysfunction was found in 40.8% of psoriasis patients [4]. Although other studies following this study reported that a quarter of psoriasis patients had a decrease in their sexual activity after developing the disease, the effect of psoriasis on sexual health has not been fully elucidated [5]. The impact of psoriasis on sexual health may be linked to a variety of factors, including its detrimental effect on a person's physical appearance, decreased libido, and discomfort caused by both skin shedding and topical treatment. The relationship between psoriasis and erectile dysfunction may be overlooked due to the presence of comorbidities such as sedentary lifestyle, dyslipidemia, hypertension, diabetes, obesity, metabolic syndrome and depression [6].

Many studies have been conducted on the association of psoriasis and metabolic syndrome. The frequency of metabolic syndrome was found to be higher in psoriasis patients compared to the normal population, additionally serum lipid values and obesity, which are among the diagnostic criteria for metabolic syndrome, have increased [7].

Depression and anxiety disorders are the most common psychiatric disorders in patients diagnosed with psoriasis. In patients with psoriasis, depression is seen with a rate of 44% and anxiety disorders with a rate of 55% [8]. Coexistence of psychiatric disorders also negatively affects the life quality of psoriasis patients. Therefore, identifying and treating psychiatric disorders in psoriasis patients can improve the life quality of patients [9].

In this study, it is investigated that the relationship between the severity of the current illness, psychosocial health problems and coexisting metabolic syndrome on sexual health in male patients with psoriasis.

2. Materials and methods

After obtaining ethics committee approval for the study, 52 male patients with psoriasis who applied to Cumhuriyet University Hospital Dermatology Outpatient Clinic were included in the study. For the control group, 50 healthy men without diagnosis of psoriasis were included in the study. All of those included in the study were over 18 years old and were married. Patients with a history of urological surgery that could cause erectile dysfunction, a history of serious chronic disease or malignancy, psychotic disorder, and pharmacotherapy that could cause erectile dysfunction such as antidepressants were not included in the study. Consent of all participants included in the study was obtained. The treatment processes of the patients were examined and categorized (phototherapy, cyclosporine, methotrexate, biological agent etc.). Blood samples were taken to determine triglyceride, HDL and fasting blood glucose parameters of the patients. PASI and DLQI of the patients in the psoriasis group were recorded. Body mass index (BMI) of the patients was determined by dividing the patient weight in kilograms by

the square of the height in meters (kg/m^2).

2.1 PASI

PASI is used to measure the clinical severity and percentage of area affected of psoriasis. Body is categorized as head, trunk, upper and lower extremities. Scoring is made according to the severity of the lesions. 0 point if there are no symptoms, 1 if mild, 2 if moderate, 3 if severe, 4 points if very severe.

2.2 DLQI

DLQI is designed to measure the impact on the quality of life of a person affected by dermatological disease. It is a 10-question survey in which each question is scored between 0 and 3.

0–1 = No effect, 2–5 = Small effect, 6–10 = Moderate effect, 11–20 = Very large effect, 21–30 = Extremely large effect on the patient's life.

2.3 IIEF

This questionnaire reflects the ability of male patients to attain and maintain an erection sufficient for sexual intercourse and the degree of sexual satisfaction. Erectile function questions consisting of 6-questions (questions 1, 2, 3, 4, 5 and 15) provide information about severity of ED.

26–30 = No ED, 22–25 = Mild ED, 17–21 = Mild-moderate ED, 11–16 = Moderate ED, 6–10 = Severe ED.

2.4 HAM-D

The psychiatric conditions of all participants were determined using the HAM-D. HAM-D is a 17-question test that examines the depression symptoms of patients in the last week. The highest score is 53.

0–7 = No depression, 8–15 = Mild depression, 16–28 = Moderate depression, 29–53 = Severe depression.

2.5 MetS

MetS diagnosis of the participants was made using the National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III). MetS is diagnosed by having at least three of these criterias: Abdominal obesity (waist circumference > 102 cm for men), Hypertension (TA $\geq 130/85$ mmHg), Hypertriglyceridemia (150 mg/dL), Low HDL (high density lipoprotein) (men < 40 mg/dL), Hyperglycemia (fasting blood glucose ≥ 110 mg/dL)

The data obtained from the study were evaluated with the SPSS 23.0 program. Analytical methods (Kolmogorov-Smirnov/Shapiro-Wilk's test) were used to determine the normal distribution of variables. Parametric tests were used for normally distributed data, and non-parametric tests were used for non-normally distributed data. Student's *t*-test was used to compare normally distributed data, and Kruskal-Wallis test was used for non-normally distributed data. Chi-square test was used to compare categorical values. Pearson/Spearman test was used for correlation. To compare independent and parametric groups more than two, Post

TABLE 1. Demographic datas and mean values of groups.

	Psoriasis group (Mean ± SD/n (%))	Control group (Mean ± SD/n (%))	P value
Age	44.3 ± 14.8	41.2 ± 14.5	0.201
BMI	27.42 ± 4.32	26.67 ± 4.21	0.194
PASI	6.67 ± 5.27		
DLQI	24.28 ± 6.99		
IIEF	18.70 ± 5.80	23.78 ± 5.20	0.017
HAM-D	9.59 ± 5.12	5.28 ± 3.71	0.005
MetS	17 (32.6%)	11 (22%)	0.009

TABLE 2. Distribution of patients according to IIEF values.

	Psoriasis group n (%)	Control group n (%)
No ED (26–30)	12 (23.1%)	19 (38%)
Mild ED (22–25)	18 (34.6%)	14 (28%)
Mild-moderate ED (17–21)	11 (21.2%)	10 (20%)
Moderate ED (11–16)	5 (9.6%)	4 (8%)
Severe ED (6–10)	6 (11.5%)	3 (6%)

Hoc multiple comparison test was used. A multiple linear regression model was used to identify independent predictors of IIEF scores. The level of error was 0.05.

3. Results

The mean age was 44.3 ± 14.8 in the psoriasis group and 41.2 ± 14.5 in the control group ($P = 0.208$). The BMI in the psoriasis and control groups was 27.42 ± 4.32 and 26.67 ± 4.21 respectively, and the difference was not statistically significant ($P = 0.194$). The mean psoriasis diagnosis time in the psoriasis group was 6.78 ± 3.12 years and the mean PASI score was 6.67 ± 5.27. Smoking was 40.4% in the patient group and 46.0% in the control group, and there was no significant difference ($P = 0.834$). MetS was seen in 17 patients (32.6%) with a higher rate in the psoriasis group and in 11 patients (22%) in the control group, with a significant difference between the groups ($P = 0.009$).

While HAM-D was 9.59 ± 5.12 in the psoriasis group, it was 5.28 ± 3.71 in the control group and the difference was significant ($P = 0.005$) (Table 1).

The IIEF values of the psoriasis group (18.70 ± 5.80) was significantly lower than the control group (23.78 ± 5.20) ($P = 0.017$). IIEF values of the patients and the control group are given in Table 2. There was a significant difference between the IIEF values of the patient and the control group without metabolic syndrome ($P = 0.04$).

6 patients (11.5%) did not receive any treatment, 11 (21.2%) phototherapy, 18 (34.6%) methotrexate, 1 (1.9%) cyclosporine, 5 (9.6%) acitretin and 11 (21.2%) were receiving biological agent treatment. Average IIEF values and average DLQI scores according to treatment groups are given in Table 3. The Post Hoc test results showed that, IIEF differences of the group that received methotrexate treatment according to the group that did not receive treatment, group that received phototherapy, acitretin, and biological agents were $P = 0.027$, $P = 0.039$, $P = 0.046$, $P = 0.042$, respectively (one patient receiving cyclosporine treatment is excluded). No significant difference was

detected in the Post Hoc test performed according to the DLQI parameter of the treatment groups.

When the psoriasis group was divided into groups according to the HAM-D scale, IIEF was 20.2 in the group with no depression ($n = 30$), 18.7 in the mild depression group ($n = 15$), 14.1 in the moderate depression group ($n = 5$), 10.2 in the severe depression group ($n = 2$) (Table 4).

IIEF value had a significant negative correlation with age, HAM-D and PASI scores (Table 5). When the patients were divided into 2 groups as with and without metabolic syndrome, a significant difference was observed in IIEF values between the two groups ($P = 0.042$).

Age, MetS, HAM-D and presence of psoriasis were found to be independent predictors of IIEF in all participants by multiple regression analysis (Table 6).

4. Discussion

In our study, we examined the effects of psoriasis on sexual dysfunction, metabolic syndrome and psychosocial health problems. We have shown the negative effect of psoriasis on male sexual functions. It was observed that the incidence of ED was higher in patients compared to the control group. We think that this situation is caused by both psoriasis itself and the metabolic syndrome and psychosocial health problems that increase in frequency with psoriasis. We found that psoriasis patients were more prone to depression compared to the control group and IIEF values were negatively correlated with the severity of the disease. In addition, the increase in ED frequency may be related to atherosclerosis and decreased penile blood flow by changing the blood lipid profile as a result of the higher rate of metabolic syndrome in the patient group.

We demonstrated that the IIEF values of the patients using methotrexate was lower than the groups that received other treatments. This situation may be the effect of the treatment used, as well as the severity of the disease. Treatment modalities had no effect on DLQI. We showed the effect of depression on ED. The lowest IIEF was seen in severely

TABLE 3. Mean IIEF value, ED severity and mean DLQI scores by treatment.

Treatment	n (%)	IIEF_avg	ED_severity	DLQI_avg
No treatment	6 (11.5%)	25.9	Mild	24.1
Phototherapy	11 (21.2%)	19.1	Mild-moderate	23.8
Methotrexate	18 (34.6%)	14.2	Moderate	25.1
Cyclosporine	1 (1.9%)	12.6	Moderate	32.0
Acitretin	5 (9.6%)	19.7	Mild	22.6
Biological agent	11 (21.2%)	20.1	Mild-moderate	23.4

TABLE 4. Distribution of psoriasis group according to Hamilton depression scale and mean IIEF values (IIEF_avg).

HAM-D	n (%)	IIEF_avg
No depression	30 (57.6%)	20.2
Mild depression	15 (28.8%)	18.7
Moderate depression	5 (9.6%)	14.1
Severe depression	2 (3.8%)	10.2
Total	52	18.7

TABLE 5. Correlation of the patient group with age, BMI, PASI, psoriasis diagnosis time, HAM-D values and IIEF.

	r value	P value
Age	-0.405	0.028
BMI	-0.202	0.082
PASI	-0.394	0.014
Psoriasis diagnosis time	-0.114	0.093
HAM-D	-0.217	0.043

TABLE 6. Multiple linear regression analysis of independent predictors of IIEF-6 scores.

	B (Standardized)	P value
Age	-0.312	<0.001
MetS	0.415	0.034
HAM-D	-0.402	0.042
Psoriasis	0.306	0.019

depressed patients. Although it was shown in our study that duration of illness and psychosocial status negatively affect male sexual health, it was seen that the main determinant factors were age and the severity of the disease.

According to the study of Cabete *et al.*, [10] psoriasis patients had a higher prevalence of ED than controls (43.8% vs 61.5%, $P = 0.001$) and had an increased risk of ED. DLQI, genital psoriasis and the duration of the disease were not associated with the presence of ED. In our study, the prevalence of ED was higher than the control group, and it was similar to this study.

Chen *et al.* [11] reported that psoriasis is not a risk factor only by itself for ED, but a result of accompanying psychological factors. Although our study shows that ED is closely related to many psychological and metabolic problems, it shows that there is an undeniable relationship between the severity of psoriasis and ED. Wylie *et al.* [12] showed in their study that methotrexate may be associated with decreased libido and ED. Methotrexate is thought to cause this condition by disrupting the estrogen-testosterone balance [13].

In our study, it is seen that the frequency and severity of ED increased in the group receiving methotrexate treatment. Along with the severity of the disease and accompanying metabolic diseases, it is observed that the agents used in the treatment have negative effects on male sexual health.

Some studies reported that testosterone levels in psoriasis patients were lower than the control group and estradiol levels were higher than the control group. They also found negative correlation between PASI and estradiol levels. In our study, we think that the severity of ED's correlation with PASI may related to this [14, 15].

Although Bardazzi *et al.* [16] associated ED especially with patients with mild psoriasis, it was observed in our study that the incidence and severity of ED increased as PASI increased (psoriasis progressed). Ji *et al.* reported that investigating erectile function can help assess cardiovascular status and determine the increased risk of cardiovascular events in patients with plaque psoriasis [17, 18]. In psoriasis patients, sexual health problems should be examined in detail both to diagnose cardiovascular diseases early and to increase their quality of life.

5. Conclusions

As a result, the study showed that psoriasis has negative effects on male sexual health. Our opinion of the possible reasons based on the research are the natural course of the disease, its coexistence with diseases such as metabolic syndrome and depression, and the agents used in its treatment.

Author contributions

All authors designed the data collection method, collected the data, analyzed the data and reviewed drafts of the paper. All authors analyzed the data, wrote the paper, prepared tables and reviewed draft of the paper. All authors read and approved the final manuscript.

Ethics approval and consent to participate

All subjects gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Ethics Committee of Cumhuriyet University ethics committee (2021-02/32).

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Conflict of interest

The authors declare no conflict of interest.

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