ORIGINAL ARTICLE

Prevalence of Metabolic Syndrome in Adult Patients with Psoriasis Vulgaris

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Abstract

Background: ***One of the most prevalent chronic inflammatory skin disorders, psoriasis is increasingly thought of as a systemic disease as well as a skin condition. Epidermal hyperproliferation, aberrant keratinocyte differentiation, angiogenesis accompanied by dilated blood vessels, and an overabundance of Th-1 cells are the hallmarks of this condition.***

Aim and objectives: ***The goals of this study are(1) to compare adult psoriasis vulgaris patients with healthy controls of the same age and sex and (2) to identify the frequency of metabolic syndrome in this population and, if present, to connect this condition with the severity of psoriasis.***

Subjects and methods: ***One hundred adults suffering from psoriasis vulgaris (the "psoriatic group") and seventy healthy controls (the "healthy group") were studied in a cross-sectional fashion between 2021 and 2024 in the Dermatology Department of El-Hussein University Hospital, Faculty of Medicine Al-Azhar University. The samples were taken at random.***

Results: ***The psoriatic group had a higher prevalence of metabolic syndrome (20% vs. 14.29%, p = 0.33) than the healthy group. In comparison to the control group, psoriasis patients had higher averages for height, weight, and body mass index (BMI). The psoriatic group exhibited higher mean serum triglyceride and cholesterol levels but significantly lower random blood sugar levels than the healthy group.***

Conclusion: ***Lastly, the study's findings lend credence to the notion that metabolic syndrome and psoriasis are connected, particularly in the most severe cases of the condition.***

Keywords: Psoriasis Vulgaris; Metabolic Syndrome; Adult Patients

1. Introduction

The inflammatory skin condition known as psoriasis is triggered by the immune system and can lead to a significant risk of cardiovascular complications. There is substantial evidence linking psoriasis to metabolic syndrome (MS).[1]

Possible shared inflammatory mechanisms and hereditary susceptibility are at the heart of the connection between psoriasis and multiple sclerosis.[2]

Among its many manifestations, the vast majority (about 90%) manifest as chronic plaque psoriasis, often called psoriasis vulgaris. Worldwide, psoriasis impacts 1-3% of the population. Psoriasis has multiple known risk factors, but research has revealed that a person's family medical history is the most significant one.[3]

Psoriasis patients are at high risk for serious complications that can lower their quality of life. These complications can include a decline in physical and mental functioning similar to what is observed in other serious medical conditions such as cancer, arthritis, high blood pressure, cardiovascular disease, diabetes, and depression.[4]

The risk of mortality from consequences such as metabolic syndrome is higher in cases of severe psoriasis compared to moderate cases.[5]

A collection of metabolic abnormalities known as metabolic syndrome sometimes presents as a combination of symptoms, such as insulin resistance, obesity, atherogenic dyslipidemia, dysglycemia, hypertension, and abdominal obesity. The complex and poorly understood biology of the metabolic syndrome raises the possibility that a wide range of underlying risk factors could cause it.[6]

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Although the exact mechanism by which metabolic problems and skin inflammation are related remains a mystery, mounting evidence points to a shared etiology that includes factors such as insulin resistance, a family history of the disease, a person's genetic makeup, and an unhealthy lifestyle.[7]

The objective of this research was to compare healthy adults with psoriasis vulgaris to those of similar ages and sexes, and to find out how often metabolic syndrome was present, and how it was correlated with the severity of psoriasis.

2. Patients and methods

One hundred adults suffering from psoriasis vulgaris (the "psoriatic group") and seventy healthy controls (the "healthy group") were studied in a cross-sectional fashion between 2021 and 2024 in the Dermatology Department of El-Hussein University Hospital, Faculty of Medicine Al-Azhar University. The samples were taken at random.

Inclusion criteria:

Chronic plaque psoriasis (psoriasis vulgaris), and age 18 years or older.

Exclusion criteria:

Participants were not allowed to participate if they were pregnant, taking any pharmacological agents with known lipid-modulating or glucose-altering effects, taking biologics, or were on systemic therapy for psoriasis (including acitretin, cyclosporine, methotrexate, phototherapy, or biologics) within the two months prior to enrollment.

The diagnosis of psoriasis was made clinically. All subjects (cases and controls) were subjected to the following:

To take a patient's medical history, we looked at their age, sex, the length of time they've had psoriasis, and any co-morbidities they may have had, such as high blood pressure, IHD, stroke, or diabetes mellitus type 2. Basic health measurements like weight, height, arterial blood pressure, and body mass index (BMI) are determined by dividing weight in kilograms (kg) by height in meters (m) squared. Psoriasis Area Severity Index (PASI) score evaluation for psoriasis severity.

Psoriasis area severity index (PASI):

A doctor can rate the severity of psoriasis in four areas: the head, the upper limbs, the trunk, and the lower limbs using the PASI Carlin et al.,[8] Each spot is assigned a score based on the area affected and the severity of the psoriasis.

Three characteristics—erythema (redness), induration (thickness), and desquamation (scaling)—that are graded on a scale from 0 (none) to 4 (very severe) are added to provide a severity score that ranges from 0 to 12. Surface area scores are given on a scale of 0 (zero) to 6 (90–100%). The severity aggregate score is multiplied by the surface area score to produce the four body location scores, which can range from 0 to 72. Each location score is multiplied by a certain adjustment score, which is as follows: head = 0.1, upper limbs = 0.2, trunk = 0.3, and lower limbs = 0.4. This results in a total score that ranges from 0 to 72. Based on their PASI score, each patient was assigned to one of three groups: mild (values under 10), moderate (numbers between 10 and 20), or severe (values over 20).[9]

Twelve hours following the last meal, the subjects underwent laboratory testing while fasting. This encompasses electrocardiogram (ECG) cardiography, random blood sugar levels, and measurements of lipid profiles (HDL, LDL, triglycerides, cholesterol, etc.).

The updated criteria from the Adult Panel-III of the National Cholesterol Education Program (NCEP) were used to diagnose metabolic syndrome. Energy molecules.[10]

Ethical considerations:

Registration Number: 0000073 was used to acquire ethical permission from the Research Ethics Committee at the Faculty of Medicine, Al-Azhar University.

Data analysis:

Version 22.0 of the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL) was used to enter and evaluate the data that was obtained. For categorical data, we used frequencies; for continuous data, we used means and standard deviation (SD). Researchers used t-tests for continuous variables and chi-square tests for categorical variables to compare psoriasis cases and controls by personal, clinical, and research-based metabolic syndrome characteristics and lipid profiles. Based on their Psoriasis Area and Severity Index (PASI) score categories (≦10 and>10), the metabolic-related and lipid profile variables were compared between the healthy group and the psoriatic group using independent t-tests. As part of the research, we used Pearson's correlation to look at the relationships between the PASI score and the metabolic-related and lipid profile variables. We plotted each of these relationships on a scatter plot. The threshold for statistical significance was set at p-values≤0.05.

3. Results

Table 1. Comparison of the (psoriatic group) and (healthy group) by their personal data, and associated co-morbidities.

PERSONAL DATA	PSORIATIC GROUP (N=100)	HEALTHY GROUP (CONTROL) (N=70)	P-VALUE
AGE IN YEARS, MEAN±SD RANGE (MINIMUM-MAXIMUM)	43.3±13.6 18-75	43.8±13.8 20-76	0.75
SEX N(%) MALE FEMALE	65(65.0) 35(35.0)	30(43.0) 40(57.0)	0.09
ASSOCIATED CO-MORBIDITIES N(%)	24(24.0)	17(24.3)	
NO DM	29(29.0)	20(28.6)	
HYPERTENSION	18(18.0)	13(18.6)	
ISCHEMIC HEART	5(5.0)	5(7.14)	
DISEASES (IHD) STROKE	3(3.0)	2(2.9)	
DM, HTN AND IHD	16(16.0)	10(14.3)	
HTN AND STROKE	5(5.0)	3(4.3)	0.34

*Data are presented by mean±SD or by n(%).

The mean age and sex distribution of the cases and controls did not differ significantly. Additionally, the linked history of co-morbidities does not significantly differ between the psoriatic and healthy groups, while ischemic heart disease, stroke, hypertension, and stroke were more common among patients, (table 1; figures 1&2).

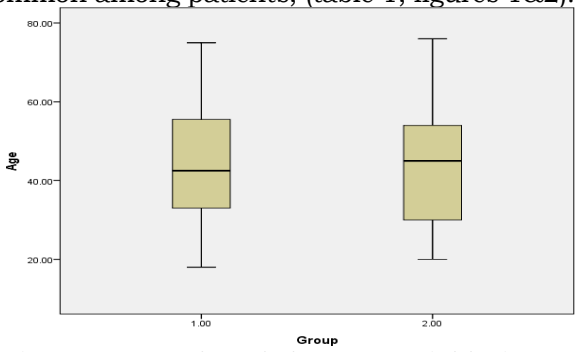

Figure 1. Boxplot of the age variable in years among the (psoriatic group) and (healthy group), 1=(psoriatic group), 2=(healthy group).

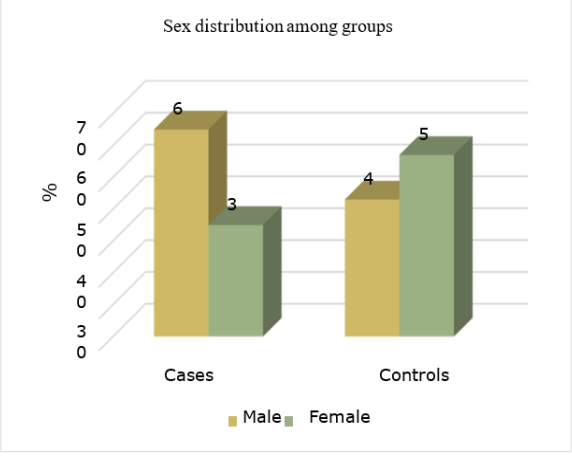

Figure 2. Sex distribution among the psoriatic group.

Table 2. Comparison of the psoriatic group and healthy group by their lipid profile variables.

LIPID PROFILE VARIABLES	PSORIATIC GROUP (N=100)	HEALTHY GROUP (CONTROL) (N=70)
RANDOM BLOOD SUGAR (MG/DL), MEAN ±SD RANGE (MINIMUM-MAXIMUM)	116.6±46.3 73-332	156.3±61.3 85-428
SERUM TRIGLYCERIDE MG/DL, MEAN±SD RANGE (MINIMUM-MAXIMUM)	134.5±52.2 30-321	128.9±67.9 26-387
SERUM CHOLESTEROL MG/DL, MEAN±SD RANGE (MINIMUM-MAXIMUM)	160.3±43.2 31-319	146.2±34.5 70-280
HDL MG/DL, MEAN±SD RANGE (MINIMUM-MAXIMUM)	49.5±19.1 25-170	50.8±15.0 30-137
LDL MG/DL, MEAN±SD RANGE (MINIMUM-MAXIMUM)	105.3 ± 86.4 4-795	55.5 ± 38.8 17-163

*Significant

The psoriatic and healthy groups' mean random blood sugar levels differed statistically significantly, with the healthy group having a higher mean random blood sugar. Serum cholesterol and LDL levels in the psoriatic and healthy groups differed statistically significantly. Among the cases under study, the mean values of LDL and cholesterol were significantly higher. There was no discernible difference between the psoriatic and healthy groups, despite the fact that the mean triglycerides were greater in the former. Although not statistically significant, the psoriatic group's HDL mean level was lower than that of the healthy group, (table 2; figure 3&4).

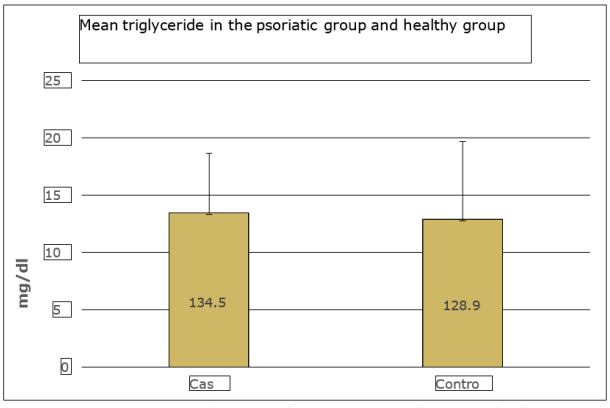

Figure 3. Comparison of mean triglyceride between the psoriatic group and healthy group.

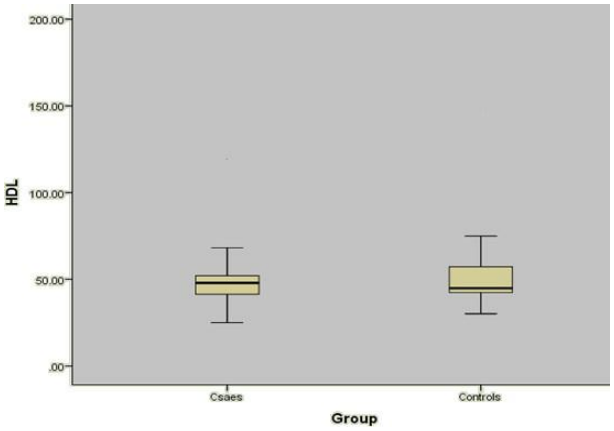

Figure 4. High-density lipoprotein (HDL) variable among the psoriatic group and healthy group.

Table 3. Comparison of metabolic syndrome variables among Psoriatic group and Healthy group (control).

METABOLIC SYNDROME VARIABLES	PSORIATIC GROUP N=100 N(%)	HEALTHY GROUP (CONTROL) N=70 N(%)	P VALUE
RANDOM BLOOD SUGAR>100 MG/DL	60(60%)	56(80%)	0.01*
SERUM TRIGLYCERIDE (STG)≥ 150 MG/DL	26(26%)	19(27.1%)	0.86
HDL MG/DL <40	18(18%)	5(7.1%)	0.04*
BMI >30 KG/M2	42(42%)	34(48.6%)	0.40

*Significant

The prevalence of random blood sugar levels > 100 mg/dl varies significantly between the psoriatic group (60%) and the healthy group (80%), according to the data (p=0.01). Furthermore, there is a notable disparity in the prevalence of low HDL cholesterol (<40 mg/dl), with 7.1% of the healthy group and 18% of the psoriatic group having low HDL cholesterol. The prevalence of triglyceride levels ≥150 mg/dl and BMI >30 kg/m2 does not, however, differ significantly between the psoriatic and healthy groups. These results imply that the psoriatic group had higher levels of metabolic syndrome variables, especially in terms of lipid and glucose profiles, though not necessarily in terms of BMI, (table 3).

Table 4. Comparison of metabolic syndrome criteria among psoriatic group and healthy group.

METABOLIC SYNDROME VARIABLES	PSORIATIC GROUP N=100 N(%)	HEALTHY GROUP (CONTROL) N=70 N(%)	P-VALUE
ONE METABOLIC SYNDROME VARIABLE	10(10%)	2(2.9)	
TWO METABOLIC SYNDROME VARIABLES	35(35%)	26(37.14)	0.28
THREE METABOLIC SYNDROME VARIABLES	10(10%)	7(10%)	
FOUR METABOLIC SYNDROME VARIABLES	9(9%)	3(4.3%)	
FIVE METABOLIC SYNDROME VARIABLES	1(1%)	0(0%)	

The frequency of one, two, three, and more metabolic syndrome characteristics was higher in the psoriatic group than in the healthy group, despite the fact that no statistically significant distinction was found, (table 4).

Table 5. Comparison of metabolic syndrome diagnosis between psoriatic group and healthy group.

WITH METABOLIC SYNDROME DIAGNOSIS	PSORIATIC GROUP N=100 N(%)	HEALTHY GROUP (CONTROL) N=70 N(%)	P-VALUE
WITH METABOLIC SYNDROME	20(80%)	10(14.3%)	0.33
WITHOUT METABOLIC SYNDROME	80(80%)	60(85.7%)	

Since the P-value is 0.33, there is no statistically significant difference in the prevalence of metabolic syndrome between the psoriatic group and healthy group, (table 5).

Table 6. Comparison of the psoriatic group according to PASI by metabolic- related variables

METABOLIC-RELATED VARIABLES	PSORIATIC GROUP PASI ≤ 10 (N=89)	PSORIATIC GROUP PASI >10 (N=11)	P-VALUE
WEIGHT IN KG, MEAN±SD	80.4±16.1	88.7±21.4	0.23
HEIGHT IN CM, MEAN±SD	166.6±9.1	165.1±8.6	0.62
BMI (KG/M^2), MEAN±SD	29.1±5.8	32.2±5.1	0.08
RANDOM BLOOD SUGAR (MG/DL), MEAN±SD	113.6±46.1	98.5±42.6	0.28
SERUM TRIGLYCERIDE MG/DL, MEAN±SD	133.8±61.9	130.1±35.6	0.77
SERUM CHOLESTEROL MG/DL, MEAN±SD	157.6±50.7	167.8±54.5	0.54
HDL MG/DL, MEAN±SD	50.2±20.3	49.6±18.1	0.92

Multiple metrics, such as weight, height, BMI, random blood sugar, serum triglycerides, serum cholesterol, and HDL levels, were compared between the two groups, PASI≤10 and PASI>10. Patients with a PASI>10 weighed, on average, more (88.7±21.4 kg) than those with a PASI≤10 (80.4±16.1 kg), but this difference was not statistically significant (p=0.23), according to the data.

The PASI >10 group had a slightly higher BMI (32.2±5.1 kg/m^2) than the PASI≤10 group (29.1±5.8 kg/m^2), but the difference was not statistically significant (p=0.08). Serum cholesterol levels also showed a significant difference (167.8±54.5 mg/dl in PASI >10 vs. 157.6±50.7 mg/dl in PASI≤10; p=0.54). The PASI>10 group had a slightly lower HDL level (49.6±18.1 mg/dl) than the PASI≤10 group (50.2±20.3 mg/dl), but

there were no discernible differences (HDL: p=0.92). Although not statistically significant (p=0.28), the random blood sugar levels in the PASI >10 group were lower (98.5±42.6 mg/dl) than in the PASI≤10 group (113.6±46.1 mg/dl).

In a similar vein, there was no discernible difference in height measurements between the PASI>10 group (165.1±8.6 cm) and the PASI≤10 group (166.6±9.1 cm; p=0.62). The PASI >10 group had lower serum triglyceride levels (130.1±35.6 mg/dl) than the PASI≤10 group (133.8±61.9 mg/dl, p=0.77), (table 6).

4. Discussion

An increased risk of cardiovascular events is linked to psoriasis, a chronic inflammatory dermatosis that is immune-mediated. There is a substantial correlation between psoriasis and metabolic syndrome (MS).[1]

Genetic predisposition and overlapping inflammatory pathways may be the underlying mechanism connecting MS and psoriasis.[2]

Similar to previous research, this study did not find a statistically significant distinction in the prevalence of metabolic syndrome between the psoriatic and healthy groups (20% vs. 14.29%), Gisondi et al.,[7] determined that, beyond the age of 40, the prevalence of metabolic syndrome was substantially higher in the psoriatic group than in the healthy group (30.1% vs. 20.6%, odds ratio 1.65, 95% CI 1.16-2.35; P=0.005).

There was a positive correlation between the PASI score and every metabolic syndrome indicator. All metabolic syndrome factors, however, did not show any statistically significant differences between mild (PASI<10) and severe (PASI≤10) psoriasis.

Also, Choudhary et al.,[11] concurred with the current investigation, which discovered that metabolic syndrome was observed in 30.29% of psoriasis patients compared to 21.70% of people in the control group. Suggesting a higher incidence of metabolic syndrome in individuals with psoriasis.

According to these findings, the psoriatic group and the healthy group differed statistically significantly in all examined BMI variables. Cases (psoriatic group) had higher mean weight, height, and BMI than controls (healthy group). Additionally, a substantially larger proportion of obese (≥30 kg/m2) and overweight (25–<30 kg/m2) patients were seen in the psoriatic group compared to the healthy group (p<0.0001).

Current findings concurred with the research conducted by Milčić et al.,[12] They discovered that psoriatic patients had a considerably higher prevalence of abdominal obesity than controls (34% vs. 18%, p=0.001). Nonetheless, there is disagreement over whether obesity is a cause of psoriasis or if it occurs before it does.[13]

Contrary to the present conclusions, a Delhi-based Indian investigation by Gopal et al.,[14] found no evidence of a strong independent link between psoriasis and obesity.

80% of the controls (healthy group) and 60% of the cases (psoriatic group) in the current study had blood glucose levels greater than 100 mg/dl.

In contrast to the findings by Patwekar and Poulkar[15] who noted that a statistically significant 22% of controls (healthy group) and 62% of cases (psoriatic group) had high fasting blood sugar levels ≥100 mg/dl, a criteria of metabolic syndrome.

The results of this study might have been affected by the smaller sample size, which could have produced different conclusions from those of studies with bigger sample sizes.

The mean triglyceride level was higher in the psoriatic group (cases) than in the healthy group (controls) in the current study. But no discernible difference was discovered. Cases (psoriatic group) had a non-significantly lower HDL mean level than controls (healthy group).

This matched the research conducted by Milčić et al.,[12] who discovered that the psoriatic group had significantly higher levels of all the components of Metabolic Syndrome, with the exception of low HDL-C: abdominal obesity (46.7% vs. 26.4%), elevated triglyceride levels (38.1% vs. 24.5%), high blood pressure (67.2% vs. 25.8%), and elevated glucose or type 2 DM (31.6% vs. 13.5%).

Numerous studies have proposed a link between atherogenic dyslipidemia and psoriasis, citing elevated levels of triglycerides, total cholesterol, low-density lipoprotein [LDL], extremely low LDL and lipoprotein A, low HDL, and apolipoprotein B.[16]

In the study by Patwekar Poulkar,[15] In comparison to 32% of controls (the healthy group), 44.66% of cases met the metabolic syndrome criterion of increased triglycerides ≥150 mg/dl, which was statistically significant. 64% of cases and 21.33% of controls matched the metabolic syndrome criterion of having lower HDL levels (HDL< 40 mg/dl in males and< 50 mg/dl in females), which was statistically significant.

The authors discovered that hypertriglyceridemia, abdominal obesity, decreased HDL cholesterol, elevated fasting blood sugar, elevated blood pressure, and alcohol misuse were all positively correlated with psoriasis. The most frequent correlations among them were lower HDL cholesterol and elevated fasting blood sugar. [15]

According to certain scientists, psoriatic patients' aberrant lipid metabolism may be inherited. [13]

Limitation: The study may not be representative of the broader population because it only included 70 healthy controls and 100 psoriasis sufferers. Because the study was only carried out at one location, selection bias may have been introduced, which would have limited how broadly the results could be applied. Potential confounding factors that could have an impact on the outcomes, such as medication use, smoking status, or degree of physical activity, were not taken into account in this study.

4. Conclusion

In summary, this study shows that psoriasis and metabolic syndrome are related, especially in severe psoriasis cases.

Disclosure

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Authorship

All authors have a substantial contribution to the article

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Conflicts of interest

There are no conflicts of interest.

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