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Association of metabolic syndrome with psoriasis and its relationship to clinical severity

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Abstract

Background: Psoriasis is a chronic inflammatory skin condition that has increasingly been associated with metabolic syndrome (MetS). This study aims to evaluate the relationship between MetS and the severity of psoriasis. **Methods:** This cross-sectional study was conducted on 100 psoriasis patients. Clinical severity was assessed using the Psoriasis Area and Severity Index (PASI), and metabolic parameters such as fasting glucose, blood pressure, lipid profile, and obesity were recorded. Correlation analysis was used to examine the connections between MetS components and PASI scores. **Results:** Of the 100 patients, 41% were men and 59% were women. The prevalence of MetS components was demonstrated by the following: 78% had central obesity, 89% had elevated triglycerides, 66% had low HDL, 81% had hypertension, and 45% had impaired fasting glucose. Alcohol use and smoking were reported in 18% and 35% of cases, respectively. Nine percent suffered from severe psoriasis, sixty-nine percent from moderate psoriasis, and twenty-two percent from mild psoriasis. More metabolic abnormalities were found in moderate to severe cases. Fasting glucose and PASI showed a strong positive correlation ($r = 0.43$, $p < 0.001$), whereas HDL and PASI showed a negative correlation ($r = -0.243$, $p = 0.015$). There was a correlation between waist circumference and fasting glucose, blood pressure, and triglycerides, but not with PASI.. **Conclusion:** This study shows a strong correlation between the severity of psoriasis and metabolic syndrome, with fasting glucose and HDL levels playing a major role. In order to prevent systemic complications and slow the progression of the disease, these findings highlight the importance of early metabolic screening and a multidisciplinary approach to psoriasis management.

Keywords: Metabolic syndrome, Psoriasis, Psoriasis Area and Severity Index (PASI).

Introduction: Psoriasis is a chronic inflammatory skin disease that is mediated by the immune system and affects 2–3% of people globally [1]. Systemic immune activation, epidermal inflammation, and keratinocyte hyperproliferation all contribute to the formation of erythematous, scaly plaques on the skin. There is mounting evidence that psoriasis is associated with several systemic co-morbidities, including metabolic syndrome (MetS), despite the fact that it primarily affects the skin [2, 3]. A collection of linked metabolic diseases known as the metabolic syndrome

increases the risk of type 2 diabetes mellitus and heart disease. Central obesity, insulin resistance, dyslipidemia, and hypertension are some of these anomalies [4].

According to recent research, chronic low-grade systemic inflammation is the primary pathophysiological mechanism that unites psoriasis and MetS. Insulin resistance, endothelial dysfunction, and abnormalities in lipid metabolism are all caused by pro-inflammatory cytokines like adipokines, interleukin-6 (IL-6), and tumor necrosis factor-alpha (TNF-α). These two disorders are further linked by immunological dysregulation and oxidative stress. In addition to raising the chance of cardiovascular problems, MetS in psoriasis patients may also affect the severity and course of the condition [5-7].

Numerous clinical studies have shown that psoriasis patients have a higher prevalence of MetS than the general population. Additionally, the severity of psoriasis, which is commonly measured using the Psoriasis Area and Severity Index (PASI), appears to be correlated with the number and presence of MetS components. Patients with severe psoriasis are more likely to be obese, have dyslipidemia, and have insulin resistance, suggesting a reciprocal relationship whereby metabolic dysfunction exacerbates psoriasis and vice versa [8-9].

Effective disease management requires an understanding of the relationship between psoriasis and metabolic syndrome. Identifying MetS in psoriasis patients can help guide treatment plans that address dermatological and systemic health issues and assist in risk assessment. This study aims to determine the prevalence of metabolic syndrome in psoriasis patients and analyze its relationship to clinical severity in order to support a more thorough approach to patient care.

Materials and Methods:

Study Design: This was a cross-sectional study. All participants provided written informed consent.

Study Population: The study included patients who had been diagnosed with psoriasis according to the American Academy of Dermatology's or the International Psoriasis Council's criteria. The following were the criteria for inclusion and exclusion: Patients who have a confirmed clinical and/or histopathological diagnosis of psoriasis and are at least 18 years old are eligible to participate. Patients who are willing to participate and give their informed consent, as well as cases that have been diagnosed recently and in the past. Patients with additional autoimmune skin conditions are excluded. Individuals who had received immunosuppressive or systemic corticosteroid treatment within the previous three months were not included. people with known endocrine or metabolic conditions that are not associated with metabolic syndrome. Women who were nursing or pregnant were also not included.

Sample Size: 100 participants were included in this study.

Clinical Assessment

I. Psoriasis Severity: The severity of psoriasis was assessed using the Psoriasis Area and Severity Index (PASI). Patients were categorized as having mild (PASI <10), moderate (PASI 10–20), or severe (PASI >20) psoriasis.

II. The National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III) criteria or the International Diabetes Federation (IDF) criteria were used to diagnose metabolic

syndrome. If a person possesses at least three of the following, they are considered to have metabolic syndrome: The parameters listed below were assessed:

- Waist circumference (≥102 cm in men, ≥88 cm in women)
- Fasting plasma glucose (≥100 mg/dl or diagnosed diabetes)
- Blood pressure (≥130/85 mmHg or on antihypertensive treatment)
- Triglycerides (≥150 mg/dl or on lipid-lowering therapy)
- HDL cholesterol (<40 mg/dl in men, <50 mg/dl in women)

Data Collection and Lab Analysis: Comprehensive demographic information, medical history, and lifestyle factors (diet, alcohol use, and smoking) were documented. Following an overnight fast, blood samples were taken for the HbA1c, lipid profile, and fasting glucose. Anthropometric (weight, height, and waist circumference) and blood pressure measurements were taken.

Statistical Analysis

SPSS version 21 was used to analyze the data.Categorical variables were represented as percentages and continuous variables as mean ± standard deviation (SD). The association between the severity of psoriasis and the elements of the metabolic syndrome was evaluated using Pearson's correlation. Statistical significance was defined as a p-value of less than 0.05.

Result

Among 100 individuals with psoriasis, 41% were men and 59% were women. Components of the metabolic syndrome were very common: 78% had central obesity, 89% had elevated triglycerides, 66% had low HDL, 81% had hypertension, and 45% had impaired fasting glucose. Of the patients, 35% reported smoking, and 18% reported drinking alcohol. 22% of people had mild psoriasis (PASI <10), 69% had moderate psoriasis (PASI 10–20), and 9% had severe psoriasis (PASI >20), according to the severity assessment. There were more metabolic abnormalities, especially obesity, dyslipidemia, and hypertension, in patients with moderate to severe psoriasis. Cardiovascular disease (1%), thyroid disease (4%), and no lung or kidney disease were reported as co-morbidities (Table No. 1). Correlation analysis revealed significant associations between metabolic parameters and psoriasis severity. Waist circumference was positively correlated with blood pressure, triglycerides, and fasting glucose ($r = 0.356$, $p = 0.001$) and negatively correlated with HDL ($r = -0.305$, $p = 0.002$), but not with PASI. There was a strong positive correlation between fasting glucose and PASI ($r = 0.438$, $p < 0.001$), suggesting that it influences the severity of psoriasis. HDL and PASI showed a negative correlation ($r = -0.243$, $p = 0.015$), indicating that lower HDL levels are linked to more severe disease (Table No. 2).

Table No. 1: Showing the clinical characteristics of psoriasis patients

Characteristics		Patients No. (%)
Gender	Male	41 (41%)
	Female	59 (59%)
Waist circumference (cm)	≥102 cm in men, ≥88 cm in women	78 (78%)
	≤102 cm in men, ≤88 cm in women	22 (22%)
Alcohol consumption		18 (18%)
Smoking habit		35 (35%)
Triglyceride (mg/dl)	≥150 mg/dl or on lipid-lowering therapy	89 (89%)
	≤150 mg/dl	21 (21%)

HDL (mg/dl)	<40 mg/dl in men, <50 mg/dl in women	66 (66%)
	>40 mg/dl in men, >50 mg/dl in women	34 (34%)
Blood pressure (mm Hg)	≥130/85 mmHg or on antihypertensive treatment	81(81%)
	≤130/85 mmHg	19 (19%)
Fasting glucose (mg/dl)	≥100 mg/dl or diagnosed diabetes	45 (45%)
	≤100 mg/dl	55 (55%)
PASI	Mild (PASI <10)	22 (22%)
	Moderate (PASI 10–20)	69 (69%)
	Severe (PASI >20)	9 (9%)
Co-morbidities		
Cardiovascular disease		1 (1%)
Lung disease		0 (0%)
Kidney disease		0 (0%)
Thyroid disease		4(4%)

Table No. 2: Showing the correlation between diagnosis of metabolic syndrome and clinical characteristics of psoriasis patients

Characteristics		Waist circumference	Fasting plasma glucose	Systolic Blood Pressure	Diastolic Blood Pressure	Triglycerides	HDL	PASI
Waist circumference	r-value	1	0.336**	0.606**	0.293**	0.341**	-0.305**	0.160
	p-value		0.001	0.000	0.003	0.001	0.002	0.112
Fasting plasma glucose	r-value		1	0.385**	0.247*	0.187	-.512**	0.438**
	p-value			0.000	0.013	0.062	0.000	0.000
Systolic Blood Pressure	r-value			1	0.447**	0.589**	-0.428**	0.174
	p-value				0.000	0.000	0.000	0.083
Diastolic Blood Pressure	r-value				1	0.528**	-0.300**	0.135
	p-value					0.000	0.002	0.180
Triglycerides	r-value					1	-0.100	0.021
	p-value						0.320	0.832
HDL	r-value						1	-0.243*
	p-value							0.015
PASI	r-value							1
	p-value							
**. Correlation is significant at the 0.01 level.								
*. Correlation is significant at the 0.05 level.								

Discussion

The findings of this study show a strong association between psoriasis and metabolic syndrome (MetS), confirming the growing body of evidence that psoriasis is more than just a skin ailment; it is a systemic inflammatory disease with significant metabolic implications. The high prevalence of MetS components among psoriasis patients in this study, including central obesity (78%), elevated triglycerides (89%), low HDL (66%), hypertension (81%), and impaired fasting glucose (45%), suggests a significant metabolic burden in this population [10, 11].

There may be a reciprocal relationship between the severity of psoriasis and metabolic dysfunction, as patients with moderate to severe psoriasis had higher levels of metabolic abnormalities, specifically obesity, dyslipidemia, and hypertension. One pathological mechanism that connects these conditions is chronic systemic inflammation, which is driven by pro-

inflammatory cytokines like TNF-α, IL-6, and adipokines. Obesity specifically exacerbates metabolic disorders by contributing to insulin resistance and the pathophysiology of psoriasis [12, 13].

The correlation analysis further strengthens this association. Blood pressure, triglycerides, HDL, and fasting glucose were all found to be significantly correlated with waist circumference, suggesting that central obesity plays a significant role in metabolic dysregulation. The severity of psoriasis was significantly positively correlated with fasting glucose (PASI, $r = 0.438$, $p < 0.001$), indicating that insulin resistance and hyperglycemia may contribute to more severe psoriasis symptoms. Furthermore, the negative correlation between HDL and PASI ($r = -0.243$, $p = 0.015$) suggests that lower HDL levels are associated with more severe psoriasis because HDL has anti-inflammatory and endothelial-protective qualities [14].

The presence of cardiovascular disease (1%) and thyroid disease (4%) as co-morbidities highlights the need for comprehensive systemic evaluation in psoriasis patients [15]. The absence of lung and kidney disease in this study may be due to the relatively small sample size or specific exclusion criteria.

Conclusion

This study highlights the importance of early detection and treatment of metabolic risk factors in psoriasis patients by showing a significant correlation between the severity of psoriasis and metabolic syndrome. Fasting glucose, HDL levels, and PASI are correlated, which implies that metabolic abnormalities could be a factor in the development of the disease. A multidisciplinary approach involving cardiologists, endocrinologists, and dermatologists is essential for improving patient outcomes because of the shared inflammatory pathways. To investigate the underlying mechanisms and possible treatment approaches that target both metabolic syndrome and psoriasis, more extensive research is required.

Conflict of Interest: None

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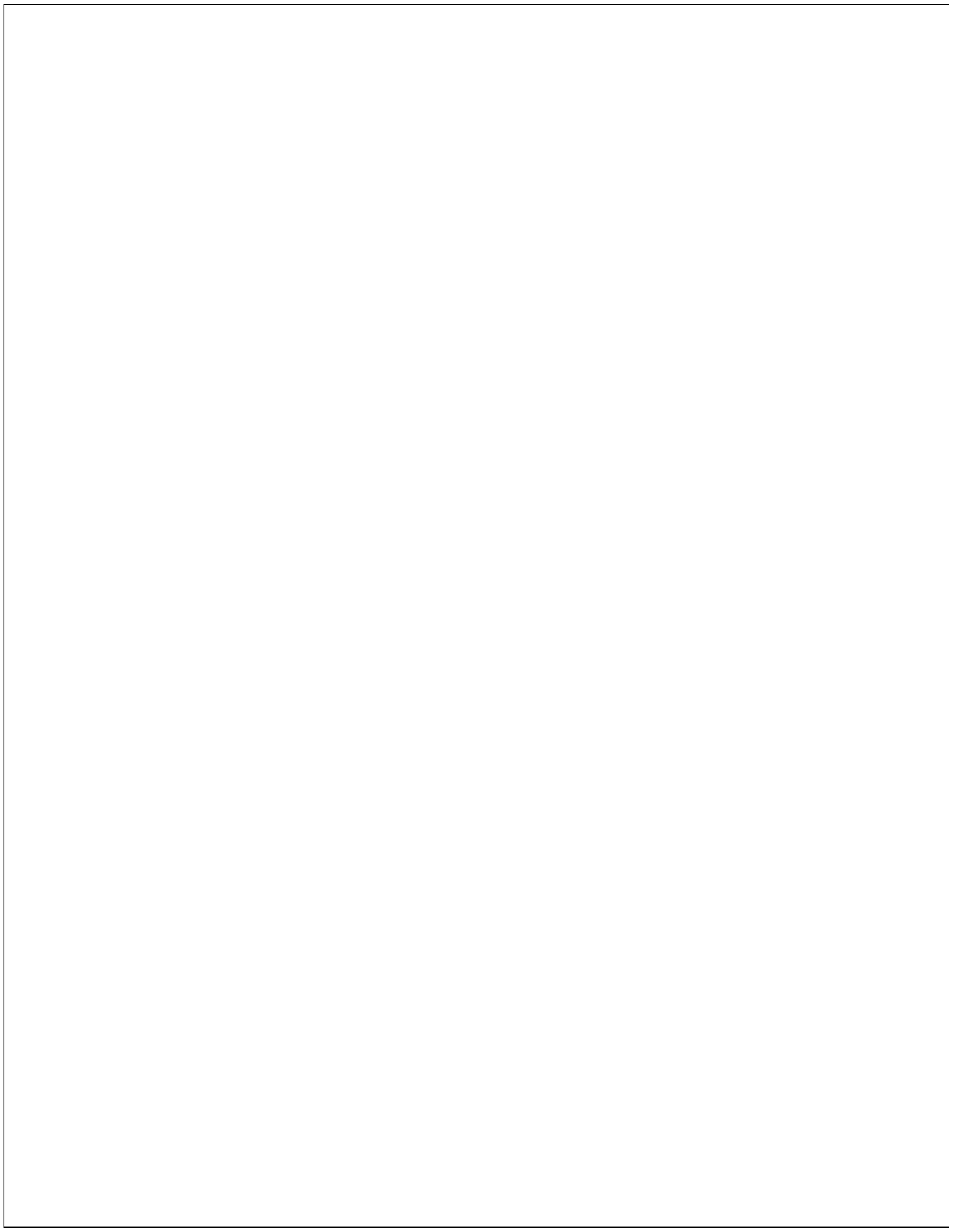

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