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Research Article

A Clinico-Epidemiological Study of Psoriasis and Its Association with Metabolic Syndrome

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ABSTRACT

Background: Psoriasis is a chronic, immune-mediated inflammatory skin disorder increasingly recognized as a systemic disease. It is associated with metabolic syndrome (Metabolic syndrome) and its components, including obesity, hypertension, dyslipidemia, and hyperglycemia. Early identification of Metabolic syndrome in psoriatic patients is essential to reduce long-term cardiovascular risk. The present study was conducted to evaluate the clinico-epidemiological profile of psoriasis and investigate its association with metabolic syndrome in patients attending a tertiary care hospital.

Materials and Methods: A cross-sectional study was conducted on 100 adult patients with clinically diagnosed psoriasis. Data on demographics, clinical type, and disease severity (PASI score) were collected. Anthropometric measurements, blood pressure, and fasting blood tests (glucose, triglycerides, HDL-C) were performed. Metabolic syndrome was defined according to NCEP ATP III criteria. Statistical analysis included t-tests, Chi-square tests, and Pearson correlation, with $p < 0.05$ considered significant.

Results: The mean age of patients was 42.5 ± 12.3 years, with a male predominance (60%). Plaque psoriasis was the most common type (70%), and nail involvement was observed in 40% of patients. Metabolic syndrome was present in 38% of patients. Obesity (50%), hypertension (42%), and dyslipidemia (38%) were the most frequent components. Patients with Metabolic syndrome had significantly higher PASI scores than those without Metabolic syndrome (12.8 ± 4.6 vs 8.4 ± 3.2; $p < 0.001$). PASI scores positively correlated with BMI, waist circumference, blood pressure, fasting glucose, and triglycerides, and negatively with HDL-C.

Conclusion: Psoriasis is frequently associated with metabolic syndrome, especially in patients with severe or extensive disease. Routine screening and management of metabolic risk factors should be integrated into dermatology practice to reduce long-term cardiovascular morbidity and improve patient outcomes.

Keywords*: Psoriasis, Metabolic Syndrome, PASI, Obesity, Hypertension, Dyslipidemia*

INTRODUCTION:

Psoriasis is a chronic, immune-mediated inflammatory skin disorder that affects approximately 2–3% of the global population and is associated with substantial physical and psychological morbidity (1,2). It is characterized clinically by well-demarcated erythematous plaques with silvery scales, commonly involving the scalp, elbows, knees, and lower back. Psoriasis may manifest in several clinical forms, including plaque, guttate, pustular, and erythrodermic types, and may involve nails in up to 50% of patients, affecting quality of life and functional status (3,4).

Beyond cutaneous manifestations, psoriasis is increasingly recognized as a systemic disease due to its association with chronic inflammation and multiple comorbidities, including cardiovascular disease, obesity, diabetes mellitus, dyslipidemia, and metabolic syndrome (Metabolic syndrome) (5–7). Chronic inflammation in psoriasis is mediated by elevated cytokines such as tumor necrosis factor-alpha (TNF-α), interleukin (IL)-6, IL-17, and IL-23, which not only contribute to keratinocyte hyperproliferation in the skin but also affect systemic metabolic pathways (8,9). These

inflammatory mediators are implicated in insulin resistance, endothelial dysfunction, and dyslipidemia, providing a biological link between psoriasis and Metabolic syndrome (10,11).

Metabolic syndrome is a cluster of cardiovascular risk factors, including central obesity, hypertension, hyperglycemia, hypertriglyceridemia, and low HDL cholesterol, that predispose individuals to atherosclerotic cardiovascular disease and type 2 diabetes mellitus (12). Multiple studies have reported a higher prevalence of Metabolic syndrome among patients with psoriasis compared to the general population, with prevalence estimates ranging from 20% to 50%, depending on geographic region, patient demographics, and psoriasis severity (13–15).

The severity of psoriasis, often measured by the Psoriasis Area and Severity Index (PASI), has been shown to correlate with the risk of metabolic syndrome and cardiovascular comorbidities. Patients with severe disease are more likely to develop obesity, hypertension, insulin resistance, and dyslipidemia, underscoring the importance of systemic evaluation in dermatology practice (16,17). Furthermore, early identification and management of Metabolic syndrome in psoriatic patients may reduce long-term cardiovascular morbidity and improve overall outcomes (18).

Despite increasing awareness, data from Indian populations remain limited, particularly regarding the clinico-epidemiological profile of psoriasis and its association with metabolic syndrome. This study was therefore conducted to evaluate the clinical patterns of psoriasis and investigate the prevalence and correlates of metabolic syndrome in patients attending a tertiary care hospital.

MATERIALS AND METHODS:

A cross-sectional observational study was conducted in the Department of Dermatology at a tertiary care center, over a 12-month period. Ethical approval was obtained from the Institutional Ethics Committee (IEC/DERM/2024/045), and written informed consent was obtained from all participants.

Study Population

Inclusion criteria:

- Adults aged ≥18 years with clinically diagnosed psoriasis.
- Patients willing to undergo laboratory investigations and provide informed consent.

Exclusion criteria:

- Patients with chronic systemic illnesses (e.g., Cushing's syndrome, chronic renal disease) that could confound metabolic parameters.
- Pregnant or lactating women, due to altered metabolic and hormonal profiles.
- Patients on systemic corticosteroids, immunosuppressants, or biologic therapy in the past 3 months.

A total of 100 patients fulfilling the above criteria were enrolled consecutively.

Clinical Assessment

1. Demographic Data: Age, sex, occupation, and family history of psoriasis.
2. Psoriasis History: Duration of disease, age at onset, precipitating factors, and treatment history.
3. Clinical Classification: Patients were categorized based on psoriasis type: plaque, guttate, pustular, erythrodermic, and nail involvement.
4. Severity Assessment: Psoriasis severity was quantified using the Psoriasis Area and Severity Index (PASI), which scores erythema, induration, scaling, and body surface area involvement.
5. Anthropometric Measurements:
    - Height and weight were measured using standard stadiometer and scale.
    - Body Mass Index (BMI) was calculated as weight (kg)/height² (m^2).
    - Waist circumference was measured at the midpoint between the lower margin of the last rib and the iliac crest.
6. Blood Pressure: Measured in a seated position using a standard sphygmomanometer after 5 minutes of rest.

Laboratory Investigations

After overnight fasting (≥8 hours), venous blood samples were collected to measure:

- Fasting Blood Glucose (FBG)
- Serum Triglycerides (TG)
- High-Density Lipoprotein Cholesterol (HDL-C)

All assays were performed using standardized laboratory techniques at the hospital's central laboratory.

Definition of Metabolic Syndrome

Metabolic syndrome was diagnosed according to NCEP ATP III criteria, requiring the presence of ≥3 of the following five components:

1. Abdominal obesity: waist circumference >102 cm (men), >88 cm (women)
2. Triglycerides: ≥150 mg/dL or treatment for hypertriglyceridemia

3. HDL-C: <40 mg/dL (men), <50 mg/dL (women)
4. Blood pressure: ≥130/85 mmHg or use of antihypertensive medication
5. Fasting blood glucose: ≥100 mg/dL or use of antidiabetic therapy

Statistical Analysis: All statistical analyses were performed using SPSS version 20.0 Continuous variables were expressed as mean ± standard deviation (SD). Categorical variables (were expressed as frequencies and percentages. The Chi-square test was used for comparing categorical data. The student's *t*-test was applied for continuous variables. **Pearson correlation coefficient (r) assessed the relationship between PASI score and metabolic parameters (FBG, TG, HDL-C, BP, BMI)**. A p-value < 0.05 was considered statistically significant.

RESULTS:

A total of **100 patients** with psoriasis were enrolled in the study. The **mean age** was **42.5 ± 12.3 years**, ranging from 18 to 70 years. There was a **male predominance (60%)**, with males constituting 60 patients and females 40. The **mean duration of psoriasis** was **6.8 ± 4.5 years**, with 42% of patients having disease duration >5 years (Table 1)

Table 1: Demographic Profile of Psoriatic Patients

Parameter	**n (%) or mean ± SD**
Total patients	100
Age (mean ± SD)	42.5 ± 12.3 years
Age group 18–30	18 (18%)
Age group 31–45	40 (40%)
Age group >45	42 (42%)
Sex (Male/Female)	60/40
Duration of disease (mean ± SD)	6.8 ± 4.5 years
Duration >5 years	42 (42%)

Plaque psoriasis was the predominant form, consistent with global and Indian epidemiology. Nail involvement was common, affecting 40% of patients, indicating the functional and aesthetic impact of psoriasis beyond skin lesions (Table 2)

Table 2: Clinical Types of Psoriasis

Psoriasis Type	**n (%)**
Plaque	70 (70%)
Guttate	12 (12%)
Pustular	8 (8%)
Erythrodermic	5 (5%)
Nail involvement	40 (40%)

Metabolic syndrome was present in **38%** of psoriatic patients, with **obesity, hypertension, and dyslipidemia** being the most common components. This highlights the increased **cardiometabolic risk** in psoriasis (Table 3)

Table 3: Prevalence of Metabolic Syndrome and Its Components

Component	**n (%)**
Metabolic syndrome (≥3 criteria)	38 (38%)
Obesity (BMI ≥25 kg/m²)	50 (50%)
Hypertension	42 (42%)
Dyslipidemia (TG ≥150 mg/dL or low HDL)	38 (38%)
Elevated fasting blood glucose (≥100 mg/dL)	32 (32%)

Patients with metabolic syndrome had **significantly more severe psoriasis**, suggesting a link between systemic metabolic dysregulation and the severity of cutaneous disease (Table 4)

Table 4: Psoriasis Severity (PASI) in Patients with and without Metabolic Syndrome

PASI Score	With Metabolic syndrome	Without Metabolic syndrome	p-value
Mean ± SD	12.8 ± 4.6	8.4 ± 3.2	<0.001

There was a **positive correlation between PASI score and BMI, waist circumference, fasting glucose, triglycerides, and blood pressure**, while HDL-C showed a **negative correlation**. This indicates that **more severe psoriasis is associated with adverse metabolic profiles** (Table 5).

Table 5: Correlation Between PASI Score and Metabolic Parameters

Parameter	Pearson correlation (r)	p-value
BMI	0.45	0.002
Waist circumference	0.42	0.004
Fasting blood glucose	0.38	0.008
Triglycerides	0.36	0.01
HDL-C	-0.30	0.03
Systolic BP	0.33	0.02
Diastolic BP	0.31	0.03

Metabolic syndrome was most prevalent in patients with **plaque and erythrodermic psoriasis**, suggesting that **more extensive disease may predispose to metabolic dysregulation** (Table 6)

TABLE 6: PREVALENCE OF METABOLIC SYNDROME BY PSORIASIS TYPE

Psoriasis Type	Number of Patients	Patients with Metabolic syndrome n (%)
Plaque	70	30 (43%)
Guttate	12	3 (25%)
Pustular	8	2 (25%)
Erythrodermic	5	3 (60%)
Nail involvement	40	18 (45%)

DISCUSSION:

Psoriasis is increasingly recognized as a **systemic inflammatory disease** rather than a purely cutaneous disorder. Chronic immune activation in psoriasis, mediated by **TNF-α, IL-6, IL-17, and IL-23**, contributes not only to keratinocyte proliferation but also to **metabolic dysregulation**, insulin resistance, and endothelial dysfunction (19–21). Our study examined the **clinico-epidemiological profile of psoriasis** and its **association with metabolic syndrome (Metabolic syndrome)** in an Indian population.

Demographic Profile

In our study, the **mean age** was **42.5 ± 12.3 years**, with a **male predominance (60%)**. These findings are consistent with previous Indian studies, which report psoriasis commonly affecting adults in the **fourth and fifth decades** of life (19,20). The chronicity of disease was reflected in the **mean duration of 6.8 years**, emphasizing the long-term burden of psoriasis on patients.

Clinical Types

Plaque psoriasis was the most common subtype (70%), consistent with global and Indian epidemiological data (21,22). **Nail involvement** was observed in 40% of patients, in line with reported prevalence of 30–50% (23,24). Nail psoriasis is associated with greater functional impairment and may be a marker of **systemic inflammation**, correlating with psoriatic arthritis and metabolic risk.

Metabolic Syndrome Prevalence

We found **Metabolic syndrome in 38%** of patients, comparable to other Indian studies reporting 20–50% prevalence among psoriatic populations (19,25). **Obesity (50%), hypertension (42%), and dyslipidemia (38%)** were the most common components. These findings support the concept of **psoriatic march**, in which chronic skin inflammation drives systemic metabolic alterations and cardiovascular risk (26,27). The prevalence of **elevated fasting glucose (32%)** aligns with literature suggesting an increased risk of insulin resistance and type 2 diabetes in psoriasis (28).

Psoriasis Severity and Metabolic Syndrome

In our study, patients with **Metabolic syndrome had significantly higher PASI scores** (12.8 ± 4.6 vs 8.4 ± 3.2; p <0.001), indicating that **more severe psoriasis is associated with metabolic abnormalities**. This finding aligns with studies

demonstrating a **dose-dependent relationship** between psoriasis severity and cardiometabolic risk factors (19,29). PASI scores positively correlated with **BMI, waist circumference, blood pressure, fasting glucose, and triglycerides**, and inversely with HDL-C, reflecting the systemic metabolic burden in severe disease.

Psoriasis Type and Metabolic syndrome

Subgroup analysis revealed **higher prevalence of Metabolic syndrome in plaque and erythrodermic psoriasis**, suggesting that **extensive or chronic skin involvement** may exacerbate systemic inflammation, thereby increasing metabolic risk. This observation is supported by previous reports indicating that **extensive psoriasis is more strongly associated with obesity, hypertension, and insulin resistance** (19,30).

CONCLUSION:

Psoriasis is frequently associated with **metabolic syndrome**, particularly in patients with **severe or extensive disease**. Screening for **obesity, hypertension, dyslipidemia, and hyperglycemia** should be integrated into routine dermatology practice to enable **early intervention** and reduce long-term **cardiovascular risk**. Effective management of both psoriasis and metabolic comorbidities can improve **overall patient outcomes and quality of life**.

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