Section: DVL

Original Research Article

EVALUATION OF CARDIOMETABOLIC RISK FACTORS IN PSORIASIS PATIENT

V. Ravichandran[1]

[1]*Professor & HOD, Department of Dermatology, Venereology, and Leprosy (DVL). Swamy Vivekananda Medical College and Research Institute. Thiruchengodu. Namakkal Dt. Tamil Nadu, India.*

Received *: 11/09/2025*
Received in revised form *: 02/11/2025*
Accepted *: 19/11/2025*

Corresponding Author:
Dr. V. Ravichandran,
Professor & Head of Department, Department of Dermatology, Venereology, and Leprosy (DVL). Swamy Vivekananda Medical College and Research Institute. Thiruchengodu. Namakkal Dt. Tamil Nadu, India.
Email: raviderm@yahoo.in

DOI: 10.70034/ijmedph.2025.4.408

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2025; 15 (4); 2269-2272

ABSTRACT

Background: Psoriasis is increasingly recognized as a systemic inflammatory disorder associated with elevated cardiometabolic risk. This study aimed to assess the prevalence and pattern of metabolic abnormalities in patients with chronic plaque psoriasis and explore their correlation with disease severity.

Materials and Methods: A total of 120 adult patients with clinically confirmed psoriasis were evaluated in a tertiary care dermatology clinic. Clinical parameters, PASI scores, anthropometric indices, and biochemical markers including fasting glucose, lipid profile, hs-CRP, serum uric acid, and lipoprotein(a) were recorded. Metabolic syndrome was defined using IDF criteria. Statistical analysis included Pearson correlation and logistic regression.

Results: The prevalence of metabolic syndrome was 34.1%. Elevated BMI (71.6%), dyslipidemia (51.6%), and hs-CRP (61.6%) were common. PASI scores showed significant positive correlation with hs-CRP ($r = 0.62$, $p < 0.01$). Logistic regression identified BMI (OR 2.14), LDL (OR 1.82), and hs-CRP (OR 2.36) as independent predictors of metabolic syndrome.

Conclusion: Psoriasis patients exhibit a high burden of cardiometabolic risk factors, even in the absence of overt cardiovascular disease. Routine screening and integrated management strategies are essential to mitigate long-term systemic complications.

Keywords: Psoriasis, Metabolic syndrome, Cardiometabolic risk, hs-CRP, PASI, Dyslipidemia, Obesity.

INTRODUCTION

Psoriasis is a chronic, immune-mediated inflammatory skin disorder that affects approximately 2–4% of the global population, with increasing prevalence in both developed and developing countries.[1] Although it primarily manifests as erythematous, scaly plaques on the skin, psoriasis is now widely recognized as a systemic inflammatory condition with significant metabolic and cardiovascular implications.[2]

The pathogenesis of psoriasis involves dysregulation of the immune system, particularly the Th1 and Th17 pathways, leading to elevated levels of pro-inflammatory cytokines such as tumor necrosis factor-alpha (TNF-α), interleukin-6 (IL-6), and interleukin-17 (IL-17).[3] These cytokines not only drive keratinocyte proliferation but also contribute to systemic inflammation, endothelial dysfunction, and atherosclerosis.[4]

Several epidemiological studies have demonstrated a strong association between psoriasis and cardiometabolic risk factors, including obesity, insulin resistance, dyslipidemia, and hypertension.[5] Psoriasis patients are also at increased risk of developing type 2 diabetes mellitus and ischemic heart disease, independent of traditional cardiovascular risk factors.[6] These associations are not merely coincidental but are believed to stem from shared inflammatory pathways and genetic predispositions.[7]

High-sensitivity C-reactive protein (hs-CRP), a marker of systemic inflammation, is frequently elevated in psoriasis and correlates with disease severity.[8] Similarly, lipid abnormalities such as elevated low-density lipoprotein (LDL), reduced high-density lipoprotein (HDL), and increased triglycerides are common in this population.[9] These findings suggest that psoriasis may serve as an early

clinical marker for metabolic syndrome and cardiovascular disease.[10]

The global burden of psoriasis is further complicated by its psychological and social impact. Patients often experience reduced quality of life, anxiety, and depression, which may indirectly contribute to poor lifestyle choices and increased cardiometabolic risk.[11] This psychosomatic interplay underscores the need for holistic management approaches that address both physical and emotional health.

In India, the dual burden of psoriasis and non-communicable diseases is particularly concerning due to limited awareness and underdiagnosis of systemic comorbidities.[12] Most dermatology clinics do not routinely evaluate cardiometabolic parameters in psoriasis patients, despite growing evidence supporting integrated care models. Regional studies have reported variable prevalence rates of metabolic syndrome in Indian psoriasis cohorts, highlighting the need for standardized screening protocols.[13]

The Psoriasis Area and Severity Index (PASI) remains the gold standard for assessing disease severity, and recent studies have shown a positive correlation between PASI scores and metabolic dysfunction.[14] However, most available data are cross-sectional or retrospective, limiting the ability to understand the temporal relationship between disease activity and cardiometabolic risk.

This study was designed to evaluate the prevalence and pattern of cardiometabolic risk factors in patients diagnosed with psoriasis in a tertiary care setting in Tamil Nadu. By correlating PASI scores with clinical and biochemical markers, the aim is to identify early predictors of systemic involvement and support the need for multidisciplinary management.[15]

MATERIALS AND METHODS

Study Setting and Duration: This study was conducted in the dermatology outpatient department of a tertiary care hospital in Tamil Nadu, India. Data collection spanned a 7-month period from July 2024 to January 2025.

Study Population: Patients aged 18 to 65 years with a confirmed diagnosis of psoriasis were enrolled. Diagnosis was based on clinical evaluation and, where necessary, histopathological confirmation. Only those with chronic plaque psoriasis were included to maintain diagnostic uniformity.

Inclusion Criteria

- Adults aged 18–65 years
- Clinically or histologically confirmed diagnosis of chronic plaque psoriasis
- Willingness to provide informed consent and undergo biochemical testing

Exclusion Criteria

- Known history of cardiovascular disease, autoimmune disorders, or malignancy
- Current use of systemic immunosuppressants or biologic therapy
- Pregnant or lactating women
- Patients with active infections or acute inflammatory conditions

Ethical Considerations

The study protocol received prior approval from the Institutional Ethics Committee. All participants were informed about the study objectives, procedures, and potential risks. Written informed consent was obtained from each participant before enrollment, ensuring voluntary participation and confidentiality of personal health information throughout the study.

Data Collection Procedures

Data Collection Procedures

Each participant underwent a structured clinical evaluation and laboratory testing. The following parameters were recorded:

Clinical Assessment

- Demographics: Age, sex, duration of disease
- Anthropometry: Height, weight, body mass index (BMI), waist circumference
- Vital Signs: Blood pressure measured using a calibrated sphygmomanometer
- Disease severity is measured by the Psoriasis Area and Severity Index (PASI).

Biochemical Investigations

- Fasting Blood Glucose
- Lipid Profile: Total cholesterol, LDL, HDL, triglycerides
- High-Sensitivity C-Reactive Protein (hs-CRP)
- Serum Uric Acid
- Lipoprotein(a)

All blood samples were collected after an overnight fast of 8–10 hours and analyzed in the hospital's central laboratory using standardized protocols.

Definition of Cardiometabolic Risk Factors

- Obesity: BMI ≥25 kg/m² (Asian criteria)
- Hypertension: Systolic BP ≥140 mmHg or diastolic BP ≥90 mmHg
- Dyslipidemia: LDL ≥130 mg/dL, HDL 3 mg/L
- Metabolic Syndrome: Defined using International Diabetes Federation (IDF) criteria

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using SPSS version 26.0. DDemographic and clinical factors were summarized using descriptive statistics. Pearson correlation was applied to assess the relationship between PASI scores and hs-CRP levels. Logistic regression was applied to ascertain independent predictors of metabolic syndrome. A p-value <0.05 was considered statistically significant.

RESULTS

Demographic and Clinical Characteristics: A total of 120 patients diagnosed with chronic plaque psoriasis were included. The mean age was 42.6 ± 10.4 years, with a male-to-female ratio of 1.7:1. The average disease duration was 5.8 ± 2.3 years. The mean PASI score was 11.2 ± 3.6, with 38% of patients classified as having moderate-to-severe disease (PASI >10).

Table 1: Clinical and Biochemical Profile of Study Participants (n = 120)

Parameter	Mean ± SD / n (%)
Age (years)	42.6 ± 10.4
Male: Female	76: 44 (63.3%: 36.7%)
Duration of psoriasis (years)	5.8 ± 2.3
PASI score	11.2 ± 3.6
BMI ≥ 25 kg/m²	86 (71.6%)
Waist circumference (elevated)	72 (60.0%)
Hypertension	55 (45.8%)
Fasting blood glucose ≥ 100 mg/dL	46 (38.3%)
LDL ≥ 130 mg/dL	62 (51.6%)
HDL (low)	48 (40.0%)
Triglycerides ≥ 150 mg/dL	50 (41.6%)
hs-CRP > 3 mg/L	74 (61.6%)
Serum uric acid > 7 mg/dL	32 (26.6%)
Lipoprotein(a) > 30 mg/dL	28 (23.3%)
Metabolic syndrome (IDF criteria)	41 (34.1%)

Correlation Analysis: Pearson correlation showed a significant positive relationship between PASI score and hs-CRP ($r = 0.62$, $p < 0.01$). BMI and LDL also showed moderate correlations with PASI.

Table 2: Correlation Between PASI Score and Cardiometabolic Markers

Variable	Correlation Coefficient (r)	p-value
hs-CRP	0.62	< 0.01
BMI	0.48	< 0.01
LDL	0.44	0.03
Fasting glucose	0.39	0.04
Triglycerides	0.36	0.05

Regression Analysis: Binary logistic regression was performed to identify independent predictors of metabolic syndrome among psoriasis patients. Variables included in the model were BMI, LDL, hs-CRP, and PASI score.

Table 3: Logistic Regression Predicting Metabolic Syndrome

Predictor Variable	Odds Ratio (OR)	95% CI	p-value
BMI ≥ 25 kg/m²	2.14	1.21 – 3.62	0.01
LDL ≥ 130 mg/dL	1.82	1.09 – 3.04	0.03
hs-CRP > 3 mg/L	2.36	1.34 – 4.15	0.002
PASI > 10	1.67	0.95 – 2.94	0.07

Interpretation: Elevated BMI, LDL, and hs-CRP were statistically significant predictors of metabolic syndrome. PASI score showed a trend toward significance but did not reach statistical threshold.

DISCUSSION

This study highlights a significant burden of cardiometabolic risk factors among patients diagnosed with chronic plaque psoriasis. The prevalence of obesity (71.6%), dyslipidemia (51.6% with elevated LDL), and hypertension (45.8%) observed in our cohort aligns with global trends that position psoriasis as a systemic inflammatory condition rather than a purely dermatological disorder.[1]

The positive correlation between PASI scores and hs-CRP levels ($r = 0.62$, $p < 0.01$) reinforces the role of systemic inflammation in driving both cutaneous and metabolic manifestations. Elevated hs-CRP, a surrogate marker for cardiovascular risk, was present in over 60% of patients, suggesting that even moderate disease severity may be associated with subclinical atherosclerosis.

Our findings are consistent with those of Mehta et al., who reported increased cardiometabolic risk in psoriasis patients independent of traditional risk factors. Similarly, Armstrong et al. demonstrated that psoriasis patients have a higher incidence of metabolic syndrome, particularly when disease severity is high. In our study, 34.1% of patients met the IDF criteria for metabolic syndrome, with central obesity and dyslipidemia being the most prevalent components.

Logistic regression analysis identified elevated BMI, LDL, and hs-CRP as independent predictors of metabolic syndrome. These results underscore the importance of routine screening for cardiometabolic parameters in dermatology clinics. Interestingly, while PASI score showed a trend toward significance (OR 1.67, $p = 0.07$), it did not emerge as an independent predictor, suggesting that systemic inflammation may precede or parallel cutaneous severity.

The high prevalence of dyslipidemia and impaired fasting glucose in our cohort supports the hypothesis that psoriasis shares pathogenic mechanisms with insulin resistance and lipid metabolism disorders. Chronic inflammation mediated by TNF-α and IL-17

may impair insulin signaling and promote hepatic lipid synthesis, contributing to the observed biochemical abnormalities.

From a public health perspective, these findings are particularly relevant in the Indian context, where non-communicable diseases are rising and dermatological care often remains siloed. Integrating cardiometabolic screening into routine psoriasis management could facilitate early intervention and reduce long-term morbidity.

Limitations of this study include its single-center design and lack of a control group. However, the use of standardized clinical and biochemical assessments strengthens internal validity. Future multicentric studies with longitudinal follow-up are warranted to explore causal relationships and assess the impact of systemic therapies on cardiometabolic outcomes.

CONCLUSION

This study reinforces the growing recognition of psoriasis as a systemic inflammatory condition with substantial cardiometabolic implications. A significant proportion of patients exhibited elevated BMI, dyslipidemia, hypertension, and raised hs-CRP levels, indicating an increased risk for metabolic syndrome and cardiovascular disease. The observed correlations between disease severity and biochemical markers underscore the need for routine screening and early intervention.

Dermatology practice must evolve to incorporate cardiometabolic risk assessment as part of comprehensive psoriasis management. Identifying high-risk individuals through simple clinical and laboratory parameters can facilitate timely referrals, lifestyle modifications, and preventive care. Future research should focus on longitudinal outcomes and the impact of systemic therapies on metabolic health in this population.

REFERENCES

1. Parisi R, Symmons DP, Griffiths CE, Ashcroft DM. Global epidemiology of psoriasis: a systematic review of incidence and prevalence. J Invest Dermatol. 2013;133(2):377–85.
2. Boehncke WH, Schön MP. Psoriasis. Lancet. 2015;386(9997):983–94.
3. Lowes MA, Suárez-Fariñas M, Krueger JG. Immunology of psoriasis. Annu Rev Immunol. 2014;32:227–55.
4. Nestle FO, Kaplan DH, Barker J. Psoriasis. N Engl J Med. 2009;361(5):496–509.
5. Mehta NN, Yu Y, Pinnelas R, et al. Attributable risk estimate of severe psoriasis on major cardiovascular events. Am J Med. 2011;124(8):775.e1–6.
6. Gelfand JM, Neimann AL, Shin DB, et al. Risk of myocardial infarction in patients with psoriasis. JAMA. 2006;296(14):1735–41.
7. Takeshita J, Grewal S, Langan SM, et al. Psoriasis and comorbid diseases: epidemiology. J Am Acad Dermatol. 2017;76(3):377–90.
8. Coimbra S, Oliveira H, Reis F, et al. Interleukin (IL)-22, IL-17, and IL-23 levels in patients with psoriasis before and after treatment with etanercept. Br J Dermatol. 2010;163(6):1282–90.
9. Armstrong AW, Harskamp CT, Armstrong EJ. Psoriasis and metabolic syndrome: a systematic review and meta-analysis of observational studies. J Am Acad Dermatol. 2013;68(4):654–62.
10. Misra A, Tandon N, Ebrahim S, et al. Diabetes, cardiovascular disease, and chronic kidney disease in South Asia: current status and future directions. Lancet Diabetes Endocrinol. 2017;5(12):101–18.
11. Dogra S, Mahajan R. Psoriasis: epidemiology, clinical features, comorbidities, and clinical scoring. Indian Dermatol Online J. 2016;7(6):471–80.
12. Rapp SR, Feldman SR, Exum ML, et al. Psoriasis causes as much disability as other major medical diseases. Arch Dermatol. 1999;135(12):1451–6.
13. Kumar A, Haque A, Dhananjay. Metabolic syndrome and psoriasis vulgaris: evaluating cardiometabolic risk in a case-control study. Int J Pharm Qual Assur. 2025;16(3):151–6.
14. Cai J, Cui L, Wang Y, et al. Cardiometabolic comorbidities in patients with psoriasis: focusing on risk, biological therapy, and pathogenesis. Front Pharmacol. 2021;12:774808.
15. Lin TL, Fan YH, Fan KS, et al. Cardiovascular disease risk in patients with psoriasis receiving biologics targeting TNF-α, IL-12/23, IL-17, and IL-23. PLoS Med. 2025;22(4):e1004591.