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Original Research Article

Psoriasis and Its Association with Metabolic Syndrome and Cardiovascular Outcomes

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Abstract:

Background: Psoriasis is a chronic immune-mediated inflammatory disease increasingly recognised to be associated with metabolic syndrome and cardiovascular morbidity. Systemic inflammation in psoriasis may contribute to metabolic abnormalities and accelerated atherosclerosis.

Objectives: To evaluate the prevalence of metabolic syndrome and assess subclinical cardiovascular risk markers among patients with psoriasis.

Methods: This retrospective observational study included 190 adult patients with clinically diagnosed psoriasis attending a tertiary care centre. Demographic data, clinical characteristics, metabolic parameters, and cardiovascular risk markers were extracted from medical records. Metabolic syndrome was defined using modified NCEP ATP III criteria. Subclinical cardiovascular disease was assessed using carotid intima-media thickness (CIMT), high-sensitivity C-reactive protein (hs-CRP), ankle-brachial index (ABI), and echocardiographic evaluation.

Results: The mean age of participants was 44.8 ± 11.3 years, with a mean disease duration of 8.6 ± 4.8 years and a mean PASI score of 13.4 ± 5.6. Metabolic syndrome was present in 103 patients (54%). Abdominal obesity was the most common component (78%), followed by elevated triglycerides (63%) and low HDL cholesterol (59%). Increased CIMT (>0.8 mm) was observed in 48% of patients, elevated hs-CRP (>3 mg/L) in 61%, reduced ABI (<0.9) in 12%, and echocardiographic diastolic dysfunction in 18%, indicating a high burden of subclinical cardiovascular disease.

Conclusion: Patients with psoriasis demonstrate a high prevalence of metabolic syndrome, systemic inflammation, and subclinical cardiovascular abnormalities, even at moderate disease severity. These findings support routine cardiometabolic screening and integrated multidisciplinary management to reduce long-term cardiovascular risk in psoriasis patients.

Keywords: Psoriasis; Metabolic Syndrome; Cardiovascular Risk; Systemic Inflammation; Subclinical Atherosclerosis.

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Introduction

Psoriasis is a chronic, immune-mediated inflammatory dermatosis affecting approximately 2-3% of the global population and is associated with significant physical, psychological, and socioeconomic burden [1, 2]. Traditionally regarded as a disease limited to the skin and joints, psoriasis is now increasingly recognised as a systemic inflammatory condition with multisystem involvement [3]. Advances in immunopathogenesis have demonstrated the central role of T-helper (Th1 and Th17) cells, pro-inflammatory cytokines such as tumour necrosis factor-α (TNF-α), interleukin-17 (IL-17), and interleukin-23 (IL-23), which not only drive cutaneous manifestations but also contribute to systemic inflammation [4, 5].

Accumulating evidence suggests a strong association between psoriasis and metabolic syndrome, a constellation of interrelated cardiovascular risk factors including central obesity, dyslipidemia, hypertension, and insulin resistance [6]. Chronic inflammation, endothelial dysfunction, and shared genetic and lifestyle risk factors are thought to underpin this association [7]. Several epidemiological studies have demonstrated a higher prevalence of metabolic syndrome and its individual components among patients with psoriasis compared to the general population, with risk increasing in relation to disease severity and duration [8, 9].

Beyond metabolic syndrome, psoriasis has been increasingly linked to adverse cardiovascular outcomes, including coronary artery disease, myocardial infarction, stroke, and increased cardiovascular mortality [10, 11]. Systemic inflammation in psoriasis promotes atherosclerosis through mechanisms such as oxidative stress, endothelial activation, and plaque instability, leading to accelerated cardiovascular disease [12]. Imaging studies have further shown increased vascular inflammation and subclinical atherosclerosis in patients with moderate to severe psoriasis, even in the absence of traditional cardiovascular risk factors [13].

The recognition of psoriasis as an independent cardiovascular risk factor has important clinical implications, particularly in resource-limited settings where early screening and preventive strategies may be underutilised [1, 4]. Despite growing international data, regional studies evaluating the coexistence of psoriasis, metabolic syndrome, and cardiovascular outcomes remain limited, especially in retrospective clinical settings. Variations in genetic background, lifestyle factors, healthcare access, and treatment patterns necessitate population-specific data to better inform clinical practice.

The present study aims to evaluate the association between psoriasis and metabolic syndrome and to assess cardiovascular outcomes among patients with psoriasis. By analysing clinical and metabolic parameters in affected individuals, this study seeks to contribute to the growing body of evidence supporting a multidisciplinary approach to the management of psoriasis, emphasising early identification and modification of cardiovascular risk factors.

Materials and Methods

Study Design and Setting: This observational study was conducted at a tertiary care hospital. Medical records of patients diagnosed with psoriasis were reviewed over a study period of one year.

Study Population: Adult patients (≥18 years) with a confirmed diagnosis of psoriasis based on clinical assessment with or without histopathological confirmation were included. Patients were excluded if medical records were incomplete or if they had coexisting systemic inflammatory or autoimmune disorders (other than psoriatic arthritis), active malignancy, chronic infectious diseases, or were receiving long-term systemic corticosteroids for indications unrelated to psoriasis.

Clinical and Demographic Data Collection: Data were extracted from inpatient and outpatient medical records using a standardised data collection proforma. The following variables were recorded:

- Demographic details: age and sex
- Psoriasis-related variables: age at disease onset, duration of psoriasis, clinical type of psoriasis, and presence of psoriatic arthritis
- Psoriasis severity: Data on standardised severity indices such as Psoriasis Area and Severity Index (PASI) or Body Surface Area (BSA) involvement were not consistently available due to the retrospective nature of the study and were therefore not included in the analysis
- Anthropometric measurements: body mass index (BMI) and waist circumference (where documented)
- Blood pressure: systolic and diastolic blood pressure measurements or documented diagnosis of hypertension
- Laboratory parameters: fasting plasma glucose and lipid profile, including total cholesterol, triglycerides, high-density lipoprotein (HDL) cholesterol, and low-density lipoprotein (LDL) cholesterol

Definition of Metabolic Syndrome: Metabolic syndrome was defined using the modified National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III) criteria, adapted for Asian/Indian population cut-offs. A diagnosis of metabolic syndrome was made when three or more of the following components were present:

1. Abdominal obesity
2. Hypertriglyceridemia
3. Low HDL cholesterol
4. Hypertension
5. Impaired fasting glucose

Cardiovascular Outcomes: Cardiovascular outcomes were identified from documented clinical diagnoses, hospital discharge summaries, and relevant investigation reports. These included coronary artery disease, myocardial infarction, and cerebrovascular accident (stroke). Cardiovascular mortality could not be reliably assessed due to incomplete documentation in retrospective records and was therefore not included in the analysis.

Statistical Analysis: Data were entered into a spreadsheet and analysed using SPSS statistical software. Continuous variables were tested for normality and expressed as mean ± standard deviation or median with interquartile range, as appropriate. Categorical variables were summarised as frequencies and percentages.

Patients were categorised into groups based on the presence or absence of metabolic syndrome. Comparisons between groups were performed using the Student's t-test or Mann–Whitney U test for continuous variables and the chi-square test or Fisher's exact test for categorical variables. Multivariate logistic regression analysis was conducted to evaluate the association of psoriasis

with metabolic syndrome and cardiovascular outcomes, adjusting for potential confounding factors such as age and sex. A p-value of <0.05 was considered statistically significant.

Results

A total of 190 patients with psoriasis were included in the study. The demographic and clinical characteristics of the cohort are summarised in Table 1. The population had a broad age range and varying disease durations, allowing for a representative assessment of psoriasis severity and associated factors. Key characteristics such as smoking status, body mass index (BMI), and Psoriasis Area and Severity Index (PASI) scores were evaluated to describe the overall profile of the study participants.

Table 1: Baseline characteristics of study participants (n=190)

Characteristic	Value
Age (mean ± SD)	44.8 ± 11.3
Duration of psoriasis (mean ± SD)	8.6 ± 4.8
Mean PASI score	13.4 ± 5.6
Smoking status (current smokers)	32%
BMI (mean ± SD), kg/m²	28.5 ± 3.9

The mean age of the cohort was 44.8 years, with a mean disease duration of 8.6 years (Table 1). The mean Psoriasis Area and Severity Index (PASI) score was 13.4 ± 5.6, indicating moderate disease severity. Approximately 32% of participants were current smokers. The mean body mass index (BMI) was 28.5 ± 3.9 kg/m², suggesting that the cohort was, on average, in the overweight range.

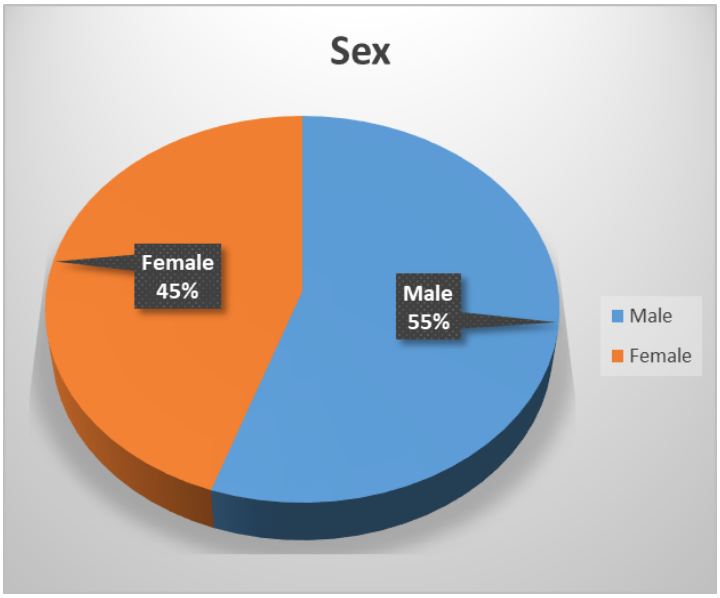

Figure 1: Sex Distribution

Of the 190 patients included in the study, 105 (55.3%) were male, and 85 (44.7%) were female, indicating a slightly higher representation of males in the cohort (Figure 1). Metabolic syndrome was present in 103 patients (54%). Among its individual components, abdominal obesity was the most prevalent, affecting 148 patients (78%), followed by elevated triglycerides in 120 patients (63%) and low HDL cholesterol in 112 patients (59%). Elevated blood pressure and elevated fasting glucose were observed in 87 (46%) and 76 (40%) patients, respectively, highlighting the substantial burden of cardiometabolic risk factors in this cohort (Table 2).

Table 2: Metabolic syndrome components in study participants (n=190)

Component	Patients, n (%)
Metabolic Syndrome (Overall)	103 (54%)
Abdominal Obesity	148 (78%)
Elevated Triglycerides	120 (63%)
Low HDL Cholesterol	112 (59%)
Elevated Blood Pressure	87 (46%)
Elevated Fasting Glucose	76 (40%)

Assessment of subclinical cardiovascular disease among the study participants revealed that 91 patients (48%) had a carotid intima-media thickness greater than 0.8 mm. Elevated high-sensitivity C-reactive protein (hs-CRP > 3 mg/L) was observed in 116 patients (61%), indicating a high prevalence of systemic inflammation. Ankle-brachial index (ABI) values below 0.9, suggestive of peripheral arterial disease, were present in 23 patients (12%). Echocardiographic evidence of diastolic dysfunction was detected in 34 patients (18%) (Figure 2).

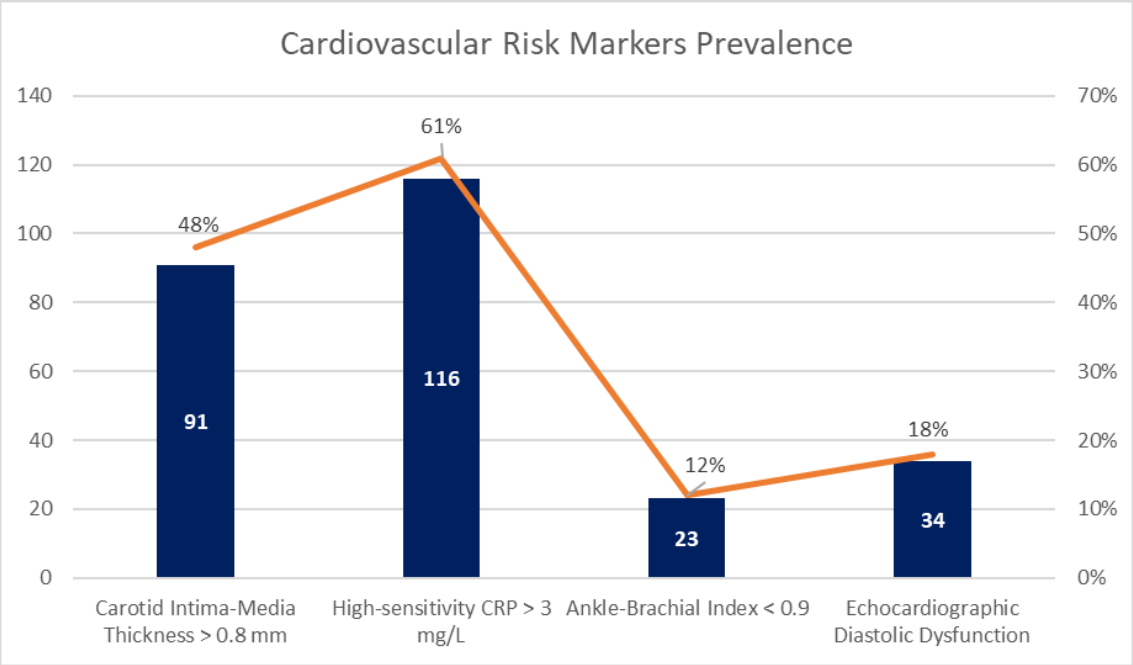

Figure 2: Prevalence of Cardiovascular Risk Markers

Discussion

In this study of 190 patients with psoriasis, we observed a high burden of metabolic syndrome, systemic inflammation, and markers of subclinical cardiovascular disease, reinforcing the concept of psoriasis as a systemic inflammatory disorder with significant cardiometabolic implications. The prevalence of metabolic syndrome in our cohort was 54%, which is substantially higher than estimates reported in the general population, supporting previous evidence that patients with psoriasis are at increased risk of cardiometabolic comorbidities [12].

The mean age (44.8 ± 11.3 years) and disease duration (8.6 ± 4.8 years) of our cohort are comparable to those reported in other hospital-based psoriasis studies, suggesting that our population is broadly representative of adults with chronic plaque psoriasis [3, 14]. The mean PASI score of 13.4 ± 5.6 indicates predominantly moderate disease severity, a range in which systemic inflammation is known to be clinically relevant and strongly associated with metabolic abnormalities [15].

Abdominal obesity was the most prevalent component of metabolic syndrome in our study (78%), followed by elevated triglycerides (63%) and low HDL cholesterol (59%). Similar patterns have been reported by Love et al. and Gisondi et al., who identified central obesity and dyslipidemia as the dominant metabolic disturbances in psoriasis [16, 17]. The high prevalence of abdominal obesity in our cohort is particularly important, as visceral adipose tissue is metabolically active and contributes to chronic low-grade inflammation through the release of pro-inflammatory cytokines such as TNF-α and IL-6, which are also central to psoriasis pathogenesis [18].

Hypertension and impaired fasting glucose were present in 46% and 40% of patients, respectively. These findings are consistent with meta-analyses demonstrating significantly increased odds of hypertension and diabetes mellitus among patients with psoriasis, especially those with longer disease duration and moderate-to-severe disease [19, 20]. While our study did not include a non-psoriatic control group, the prevalence of these abnormalities remains notably higher than expected for an age-matched general population, underscoring the clinical relevance of routine cardiometabolic screening in psoriasis patients.

Nearly half of the study participants (48%) demonstrated increased carotid intima-media thickness (CIMT > 0.8 mm), indicating a high prevalence of subclinical atherosclerosis. This aligns with previous studies showing increased CIMT in psoriasis patients independent of traditional

cardiovascular risk factors [11, 12]. The observed elevation in hs-CRP levels in 61% of patients further supports the presence of systemic inflammation, which has been strongly linked to endothelial dysfunction and accelerated atherosclerosis in psoriasis [13]. Together, these findings strengthen the hypothesis that chronic inflammatory burden contributes directly to early vascular changes in this population.

Peripheral arterial disease, as reflected by a reduced ankle-brachial index, was identified in 12% of patients. Although lower than the prevalence of other cardiovascular markers, this finding is clinically meaningful and comparable to reports by Ahlehoff et al., who demonstrated increased risk of peripheral vascular disease in patients with severe psoriasis [14, 21]. Additionally, echocardiographic evidence of diastolic dysfunction was present in 18% of participants, consistent with emerging literature suggesting subclinical myocardial involvement in psoriasis, even in the absence of overt cardiovascular disease [15].

The male predominance observed in our cohort (55.3%) mirrors patterns reported in several epidemiological studies, though sex-based differences in cardiometabolic risk among psoriasis patients remain inconsistent across studies [16]. Importantly, 32% of participants were current smokers, a known independent cardiovascular risk factor and a recognised trigger for psoriasis onset and severity, which may have contributed to the high inflammatory and metabolic burden observed in this cohort [17].

Taken together, our findings highlight a substantial overlap between psoriasis, metabolic syndrome, and early cardiovascular disease. The high prevalence of both metabolic abnormalities and subclinical cardiovascular markers in relatively young patients with moderate disease severity emphasises the need for an integrated, multidisciplinary approach to psoriasis management. Dermatologists should actively collaborate with primary care physicians and cardiologists to ensure early identification and management of cardiometabolic risk factors.

Clinical Implications

These findings highlight that psoriasis should be approached as a systemic inflammatory disease with significant cardiometabolic risk. The high prevalence of metabolic syndrome, systemic inflammation, and subclinical cardiovascular abnormalities- even in patients with moderate disease- supports routine cardiometabolic screening and early risk stratification as part of standard psoriasis care. Skin severity alone is an unreliable indicator of systemic risk, underscoring the need for integrated management strategies that include lifestyle modification and multidisciplinary care to reduce long-term cardiovascular morbidity.

Limitations

This study has certain limitations. Its cross-sectional design precludes causal inference, and the absence of a matched control group limits direct comparison with the general population. Additionally, treatment-related factors were not analysed, which may influence inflammatory and metabolic parameters. Despite these limitations, the relatively large sample size and comprehensive cardiovascular assessment strengthen the validity of our findings.

Conclusion

Our study adds to the growing body of evidence that psoriasis is strongly associated with metabolic syndrome and subclinical cardiovascular disease. Early cardiovascular risk assessment and aggressive management of modifiable risk factors should be considered an integral component of psoriasis care, particularly in patients with moderate disease severity and long disease duration.

References

1. Parisi R, Symmons DPM, Griffiths CEM, Ashcroft DM. Global epidemiology of psoriasis: a systematic review of incidence and prevalence. J Invest Dermatol. 2013;133(2):377–385.
2. World Health Organisation. Global report on psoriasis. WHO; 2016.
3. Boehncke WH, Schön MP. Psoriasis. Lancet. 2015;386(9997):983–994.
4. Lowes MA, Suárez-Fariñas M, Krueger JG. Immunology of psoriasis. Annu Rev Immunol. 2014; 32:227–255.
5. Nestle FO, Kaplan DH, Barker J. Psoriasis. N Engl J Med. 2009;361(5):496–509.
6. Alberti KGMM, Eckel RH, Grundy SM, et al. Harmonizing the metabolic syndrome. Circulation. 2009;120(16):1640–1645.
7. Davidovici BB, Sattar N, Prinz JC, et al. Psoriasis and systemic inflammatory diseases: potential mechanistic links. J Invest Dermatol. 2010;130(7):1785–1796.
8. Gisondi P, Tessari G, Conti A, et al. Prevalence of metabolic syndrome in patients with psoriasis. Br J Dermatol. 2007;157(1):68–73.
9. Love TJ, Qureshi AA, Karlson EW, Gelfand JM, Choi HK. Prevalence of the metabolic syndrome in psoriasis. Arch Dermatol. 2011;147(4):419–424.
10. Gelfand JM, Neimann AL, Shin DB, Wang X, Margolis DJ, Troxel AB. Risk of myocardial infarction in patients with psoriasis. JAMA. 2006;296(14):1735–1741.
11. 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.e1–775.e6.
12. Hansson GK. Inflammation, atherosclerosis, and coronary artery disease. N Engl J Med. 2005;352(16):1685–1695.
13. Mehta NN, Torigian DA, Gelfand JM, Saboury B, et al. Increased vascular inflammation in patients with psoriasis. Circulation. 2011; 124(13): 1509–1517.
14. Elmets CA, Leonardi CL, Davis DMR, et al. Joint AAD–NPF guidelines of care for the management of psoriasis with comorbidities. J Am Acad Dermatol. 2019;80(4):1073–1113.
15. Gonzalez-Juanatey C, et al. Subclinical atherosclerosis in psoriasis. Arthritis Rheum. 2007; 57(6):1074–1080.
16. Balci DD, et al. Increased carotid artery intima-media thickness in patients with psoriasis. Am J Med Sci. 2009;338(5):367–370.
17. Ridker PM. C-reactive protein and cardiovascular risk. Circulation. 2003; 107(3): 363–369.
18. Ahlehoff O, et al. Psoriasis and risk of peripheral vascular disease. J Intern Med. 2012; 272(5): 492–500.
19. Biyik I, et al. Subclinical cardiac dysfunction in psoriasis patients. Echocardiography. 2006; 23(8): 657–661.
20. Henseler T, Christophers E. Disease patterns of psoriasis. Acta Derm Venereol. 1995; 75(6): 425–429.
21. Naldi L, et al. Cigarette smoking, body mass index, and stress in psoriasis. BMJ. 2005; 331(7509): 199.