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Original Research Article

INCIDENCE OF HYPERLIPIDEMIA IN PSORIASIS PATIENTS: A STUDY FROM A TERTIARY CARE HOSPITAL

S. Sadiya Ameen[1], Bhargava Ram Veerapu[2], Pavani P[2]

[1]*Consultant Dermatologist, Department of Dermatology, Venereology and Leprosy, Fathima Institute of Medical Sciences, Kadapa, Andhra Pradesh, India.*
[2]*Assistant Professor, Department of Dermatology, Venereology and Leprosy, Fathima Institute of Medical Sciences, Kadapa, Andhra Pradesh, India.*

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Corresponding Author:
Dr. S. Sadiya Ameen,
Consultant Dermatologist, Department of Dermatology, Venereology and Leprosy, Fathima Institute of Medical Sciences, Kadapa, Andhra Pradesh.
Email: sadiyaameen97@gmail.com

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ABSTRACT

Background: Psoriasis is a chronic inflammatory skin disorder affecting 1–4% of the global population and is increasingly recognized as a systemic disease with multiorgan involvement. In recent years, its association with obesity, atherosclerosis, and increased cardiovascular risk has been well established. Dyslipidemia is one of the important metabolic abnormalities observed in psoriasis, and early detection of lipid disturbances may help reduce cardiovascular morbidity and mortality. With this in view, the present study was undertaken to evaluate lipid profile abnormalities in psoriasis patients and to assess their correlation with disease severity.

Materials and Methods: A hospital-based cross-sectional study was conducted among 100 psoriasis patients aged 18–60 years. Fasting venous blood samples were analyzed for total cholesterol (TC), triglycerides (TG), low-density lipoproteins (LDL-C), very low-density lipoproteins (VLDL-C), and high-density lipoproteins (HDL-C). Psoriasis severity was assessed using the Psoriasis Area and Severity Index (PASI) and categorized as mild, moderate, or severe. Statistical analysis included Chi-square test, ANOVA, and Pearson's correlation.

Results: The mean age of study subjects was 41.9 ± 12.4 years, with a male-to-female ratio of 2.1:1. Psoriasis vulgaris was the predominant type (81%), with a mean PASI score of 9.56 ± 7.37; 58% had mild, 34% had moderate, and 8% had severe psoriasis. Mean TG was 155.1 ± 42.9 mg/dl, mean TC 187.3 ± 39.7 mg/dl, and mean HDL-C 46.5 ± 13.5 mg/dl. About 39% of the subjects had optimal LDL-C levels. The mean VLDL- C was 31.02+8.57. Severity of psoriasis showed statistically significant positive correlation with TC, LDL-C whereas HDL showed negative correlation with PASI score.

Conclusion: Psoriasis patients exhibit significant lipid abnormalities, which correlate with disease severity. Early identification and treatment of dyslipidemia are essential to prevent atherosclerosis and reduce cardiovascular risk.

Keywords: Psoriasis, Dyslipidemia, Cardiovascular risk, PASI score.

INTRODUCTION

Psoriasis is indubitably one of the long-standing diseases known to humanity. It is a chronic inflammatory skin condition characterized by scaly thickened plaques due to hyperproliferation of keratinocytes and inflammatory infiltration. 10-15% can have psoriatic arthritis. The prevalence varies with geographical area. Worldwide prevalence varies between 1-4%.[1] About 0.8% to 5.6% of people in India are estimated to have psoriasis.[2]

The pathogenesis of psoriasis is not fully understood. It has been suggested that a confluence of genetic, immunological, and metabolic pathways plays a vital role in pathogenesis. However, recently, it has been observed that psoriasis is associated with obesity,

atherosclerosis, and metabolic syndrome which lead to cardiovascular disease.[3] This has been linked to variations in the plasma lipid and lipoprotein levels among individuals with psoriasis. There is evidence that suggests that the chronic inflammation seen in psoriasis plays a key role in the initiation and development of dyslipidemia and atherosclerosis. Patients with most severe disease were found to be at risk for MI, stroke, and overall cardiovascular mortality, according to numerous meta-analyses.[3] Psoriasis is currently recognized as an independent risk factor for cardiovascular morbidity and mortality. Understanding the relationship between psoriasis and aberrant lipid levels is therefore essential as early identification of these abnormalities may lead to prevention of adverse cardiovascular events among psoriatic patients.

MATERIALS AND METHODS

This hospital-based cross-sectional study was conducted in the Department of Dermatology, Venereology, and Leprosy, Fathima Institute of Medical Sciences, Kadapa, Andhra Pradesh, India, from June 2022 to December 2023. One hundred clinically diagnosed psoriasis patients aged 18–60 years were enrolled after informed consent. A detailed history regarding disease duration, family history, previous treatment, comorbidities, drug intake, smoking, and alcohol consumption was obtained. All patients underwent general, systemic, and complete mucocutaneous examinations, with documentation of nail, scalp, genital, and joint involvement.

Patients with pustular or erythrodermic psoriasis, secondary causes of hyperlipidemia (hypothyroidism, diabetes mellitus, renal or liver disease, connective tissue disorders), preexisting cardiac disease, or those receiving lipid-lowering or interfering drugs (beta-blockers, thiazides, corticosteroids, retinoids) were excluded. Individuals with a family history of dyslipidemia, smokers, and alcohol consumers were also excluded.

Disease severity was assessed using the Psoriasis Area and Severity Index (PASI)4, which evaluates erythema, induration, and desquamation (scored 0–4) across four body regions, weighted by body surface area. PASI <10 was considered mild, 10–20 moderate, and >20 severe. Modified Palmoplantar PASI was used for palmoplantar psoriasis cases.

Fasting venous blood samples were analyzed for serum total cholesterol (TC), triglycerides (TG), high-density lipoprotein cholesterol (HDL-C), calculated very low-density lipoprotein cholesterol (VLDL-C = TG/5), and low-density lipoprotein cholesterol (LDL-C = TC – [HDL-C + TG/5]) using standard enzymatic methods.

RESULTS

The study included 100 psoriasis patients aged between 18 and 60 years, with a mean age of 41.89 ± 12.35 years. Male-to-female ratio was 2.125:1.

Table 1: Patient Demographics and Clinical Characteristics (n=100)

Characteristic	Category	Frequency (%)
Age Group (years)	18-20	4 (4.0%)
	21-30	19 (19.0%)
	31-40	28 (28.0%)
	41-50	26 (26.0%)
	>50	23 (23.0%)
Gender	Male	68 (68.0%)
	Female	32 (32.0%)
Type of Psoriasis	Psoriasis Vulgaris	81 (81.0%)
	Palmoplantar Psoriasis	6 (6.0%)
	Scalp Psoriasis	6 (6.0%)
	Inverse Psoriasis	4 (4.0%)
	Psoriasis + Psoriatic Arthritis	3 (3.0%)
Duration of Psoriasis (months)	<6	14 (14.0%)
	6-12	34 (34.0%)
	13-24	32 (32.0%)
	25-60	12 (12.0%)
	>60	8 (8.0%)
Family History of Psoriasis	Yes	13 (13.0%)
	No	87 (87.0%)
Scalp Involvement	Yes	46 (46.0%)
	No	54 (54.0%)
Nail Involvement	Yes	52 (52.0%)
	No	48 (48.0%)

Table 2: Distribution of Psoriasis Severity based on PASI Score (n=100)

Severity	Frequency (n)	Percentage (%)
Mild [<10]	58	58.0
Moderate [10-20]	34	34.0
Severe [>20]	8	8.0

The mean Psoriasis Area Severity Index (PASI) score was 9.56 ± 7.37.

Table 3: Distribution of Lipid Profile in Psoriasis Patients (n=100)

Lipid Parameter	Category (Range, mg/dl)	Frequency (n)	Percentage (%)
Triglycerides	Normal (<150)	45	45.0
	Borderline High (150–199)	44	44.0
	High (200–499)	11	11.0
Total Cholesterol	Normal (<200)	70	70.0
	Borderline High (200–239)	18	18.0
	High (≥240)	12	12.0
HDL-Cholesterol	Low (<40)	34	34.0
	Normal (40-59)	44	44.0
	High (≥60)	22	22.0
LDL-Cholesterol	Optimal (<100)	39	39.0
	Near Optimal (100–129)	38	38.0
	Borderline High (130–159)	12	12.0
	High (160–189)	9	9.0
	Very High (≥190)	2	2.0

The study revealed a significant prevalence of lipid abnormalities among psoriasis patients. The mean Triglycerides level was 155.12 ± 42.87 mg/dl, with 11% of subjects showing high triglycerides levels and 44% having borderline high levels. The mean Total Cholesterol level was 187.32 ± 39.68 mg/dl, with 12% having high total cholesterol and 18% borderline high levels.

For HDL-C, the mean level was 46.51 ± 13.53 mg/dl, and notably, 34% of subjects had low HDL-C. The mean LDL-C level was 109.397 ± 36.42 mg/dl, with 39% of subjects having optimal levels and 38% had near optimal levels while 12% had borderline high, 9% had high, and 2% had very high LDL-C levels. The mean VLDL-C was 31.02 ± 8.57 mg/dl.

Table 4: Lipid Profile parameters in relation to disease severity

Parameter	Overall (mg/dl)	Mild Psoriasis	Moderate Psoriasis	Severe Psoriasis	P-value*	R-value#	P-value^
Triglycerides (TGL)	155.12 ± 42.87	150.36 ± 44.94	160.91 ± 39.18	165.00 ± 34.27	0.409	0.124	0.219
Total Cholesterol (TC)	187.32 ± 39.68	178.94 ± 38.76	196.64 ± 35.52	208.37 ± 43.67	0.030*	0.256	0.010*
HDL-Cholesterol (HDL-C)	46.51 ± 13.53	49.50 ± 13.67	42.47 ± 11.93	42.00 ± 12.25	0.029*	-0.185	0.669
LDL-Cholesterol (LDL-C)	109.397 ± 36.42	98.71 ± 33.54	121.98 ± 34.58	133.37 ± 33.18	0.001*	0.325	0.001*
VLDL-Cholesterol (VLDL-C)	31.02 ± 8.57	30.07 ± 8.99	32.18 ± 7.83	33.00 ± 6.85	0.409	0.124	0.220

* Association with Severity; # Correlation with PASI Score; ^ Correlation with PASI Score

When groups were compared, Severity of psoriasis showed a statistically significant positive association with Total Cholesterol (P=0.030), LDL-C (P=0.001), and a significant negative association with HDL-C (P=0.029). No significant association was found between psoriasis severity and triglycerides or VLDL-C levels in this analysis.

Further correlation analysis with the PASI score revealed a significant positive correlation with Total Cholesterol (R=0.256, P=0.010) and LDL-C (R=0.325, P=0.001). While triglycerides (R=0.124, P=0.219) and VLDL-C (R=0.124, P=0.220) showed positive correlations with PASI, these were not statistically significant. HDL-C exhibited a negative correlation with PASI score (R=-0.185, P=0.669), which was also not significant in this correlation analysis.

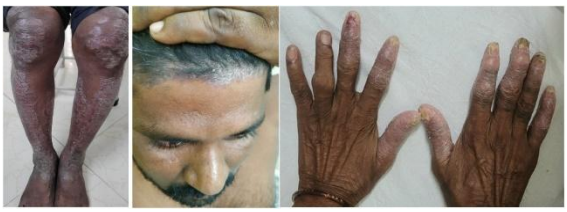

Figure 1: psoriatic plaques over legs [left], scalp [middle], psoriatic arthritis [right]

DISCUSSION

In the present study, the majority of subjects were between 31–40 years (28%), followed by 41–50 years (26%). The mean age was 41.89 ± 12.35 years, which is comparable to the study by Rosmelia et al. (43.6 ± 16.7 years).[5] Similarly, Manjula et al,[6] reported that 43.8% of patients were between 46–65 years, which aligns with our findings. Male predominance was observed (M:F = 2.01:1), consistent with Bedi et al,[7] (2.4:1) and Okhandiar et al,[8] (2.46:1). A positive family history was seen in 13% of patients, slightly lower than Akhyani et al,[9] (16%) and Bedi et al.7 (14%), but higher than Agrawal et al (10.5%).[10]

Psoriasis vulgaris was the most common subtype (81%), comparable to MK Singh et al,[11] (74.56%) and Akhyani et al (78%).[9] Other subtypes included palmoplantar (6%), scalp (6%), inverse (4%), and psoriatic arthritis (3%). The mean disease duration was 22.85 ± 26.7 months, which was shorter than Rosmelia et al,[5] (8.18 ± 9.5 years). Scalp involvement was noted in 46% of patients, similar to

Bedi et al,[7] (62%), while nail involvement was found in 52%, consistent with Bedi et al,[7] (54%) and higher than Ghosal et al (36%).[12]

The mean PASI score was 9.55 ± 7.37, compared to Agrawal et al,[10] (10.7) and Rosmelia et al,[5] (12.8 ± 10), but slightly higher than Gisondi et al,[13] (7.9). Most patients had mild psoriasis (58%), followed by moderate (34%) and severe (8%), which was similar to Gisondi et al,[13] (57.3% mild) and Rosmelia et al,[5] (57.6% mild).

Regarding lipid parameters, mean triglycerides levels were 155.12 ± 42.87 mg/dl, higher than Dreiher et al,[14] (137.6 mg/dl, p<0.001). In our cohort, triglyceride (TG) levels were borderline high in 44%, high in 11%, and normal in 45% of participants. Similarly, Rosmelia et al,[5] reported comparable patterns, with 21.2% showing borderline high TG and 3% classified as high TG. Mean total cholesterol was 187.32 ± 39.68 mg/dl, consistent with Akhyani et al,[9] (174.88 mg/dl) and Peitrzak et al,[15] (176.94 mg/dl). In our study, 18% had borderline high TC, 12% high, and 70% normal, while Rosmelia et al,[5] reported higher borderline values (57.6%).

The mean HDL-C was 46.51 ± 13.53 mg/dl, comparable to Dreiher et al,[14] (49.8 mg/dl) and Piskin et al,[16] (47.3 mg/dl). Low HDL-C was observed in 34% of patients, similar to Rosmelia et al,[5] (30.3%). Mean LDL-C was 109.39 ± 36.42 mg/dl, consistent with Akhyani et al,[9] (107.12 mg/dl) but lower than Thungathurthi et al,[17] (171.46 mg/dl). In our study, 39% had optimal LDL-C, 38% near optimal, and 12% borderline high, which was close to Rosmelia et al,[5] who reported 39.4% optimal and 51.5% near optimal. Mean VLDL-C was 31.02 ± 8.57, slightly higher than Piskin et al,[16] (26.32) but lower than Gupta et al (44.51).[18]

In this study, severity of psoriasis showed significant association with total cholesterol, HDL-C and LDL-C but no significant association was found with VLDL-C level and triglyceride levels. These findings agree with Piskin et al,[16] who found significantly higher TC and LDL-C in psoriatic patients, and with Akhyani et al,[9] who reported elevated TC and LDL-C but no association with TG. Our findings on reduced HDL were similar to Veetil et al,[19] (p=0.013), while their higher TG levels (p<0.001) contradicted our results.

Several meta-analyses and systematic reviews support psoriasis as an independent risk factor for dyslipidemia and cardiovascular disease. Ma et al,[20] demonstrated that greater psoriasis severity was associated with higher prevalence of dyslipidemia, consistent with our results. Conversely, Rosmelia et al,[5] reported no significant association between lipid parameters and psoriasis severity, and a Korean study found that the association between metabolic syndrome and psoriasis severity was not significant after adjusting for age and gender.[21]

In this study, triglyceride level and VLDL showed positive correlation and HDL showed negative correlation with PASI score which was not significant whereas significant positive correlation was found between total cholesterol level, LDL and PASI score (P<0.05). This partially aligns with Frashchian et al,[22] who reported no correlation between lipid profile and psoriasis severity. Overall, our findings reinforce evidence that psoriasis patients are at increased risk of dyslipidemia, particularly elevated TC and LDL-C with reduced HDL-C, and the disease severity may influence these metabolic changes.

CONCLUSION

Psoriasis was found to be common in 31-40 years individuals and in males. Psoriasis vulgaris was the predominant clinical type in our study. The findings confirm that psoriasis is frequently associated with significant lipid abnormalities, likely attributable to disturbances in lipoprotein metabolism. Such alterations increase the risk of atherosclerosis and cardiovascular disease among affected individuals. Early identification and prompt management of hyperlipidemia in psoriasis patients are therefore essential to reduce cardiovascular morbidity and mortality.

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