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A Jeopardy in Lipid Biochemistry Makes Psoriasis Patients Highly Prone to Suffer from Ischemic Heart Disease: A Study on the Eastern Indian Population

Anup Kumar Rana[1], Anirban Poddar[2]*, Ranjita Santra[3], Phalguni Chakrabarti[4]

[1]Assistant Professor, Department of Biochemistry, Hitech Medical College & Hospital, Bhubaneswar, Odisha, India
[2]Assistant Professor, Department of Biochemistry, Deben Mahato Govt Medical College & Hospital, Purulia, West Bengal, India
[3]Associate Professor, Dept of Pharmacology, Deben Mahato Govt Medical College & Hospital, Purulia, West Bengal, India
[4]Associate Professor, Dept of Biochemistry, Deben Mahato Govt Medical College & Hospital, Purulia, West Bengal, India

***Address for Correspondence:** Dr. Anirban Poddar, Department of Biochemistry, Deben Mahato Govt Medical College & Hospital, Purulia, West Bengal, India
E-mail: dranirbanpoddar@gmail.com

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ABSTRACT

Background: Psoriasis is a chronic inflammatory skin condition that is characterized by an inflammatory reaction and increases the risk of cardiac conditions. Dyslipidemia is the high level of cholesterol and the level of triglyceride, which is associated with psoriasis and ischemic heart conditions. Also, the psoriasis condition can lead to atherogenesis, which is exacerbated by oxidative stress and the inflammatory processes.

Methods: This is a hospital-based study, which included 25 psoriasis patients and also 25 25-patient group as a healthy control group. The study was conducted in Hi-Tech Medical College, Bhubaneswar. The serum content in blood was analysed for each of the participants with various biochemical tests. Also, Statistical analysis was performed by the use of the Student's t-test, where $p<0.05$ was considered statistically significant.

Results: The psoriasis patients have an enhanced level of cholesterol, the triglycerides, and the levels of the LDL and the HDL in comparison to the control group. There was a low level of the HAD, but it is not significant. The mean age group for the psoriasis patient was 45.7±8.9, and males are much more predominant over females.

Conclusion: The study concluded that a significant pro-atherogenic lipid pattern has been observed among psoriasis patients. Psoriasis is associated with dyslipidemia, which reveals the high risk of cardiovascular conditions along with ischemic heart disease.

Key-words: Cholesterol, Dyslipidemia, Ischemic heart disease, Psoriasis, Triglycerides

INTRODUCTION

Psoriasis is a chronic, immune-mediated inflammatory disorder classically affecting the skin and joints but increasingly recognized as a multisystem disease with substantial cardio-metabolic comorbidity.

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Systemic inflammation driven by Th1/Th17 pathways, circulating cytokines and a sustained oxidative milieu contribute not only to keratinocyte hyperproliferation but also to endothelial dysfunction, insulin resistance, and pro-atherogenic changes in lipid metabolism [1]. This theoretical background, sometimes described as the "psoriatic march", links cutaneous inflammation to accelerated atherogenesis and higher rates of cardiovascular events.

Epidemiological and mechanistic data converge to indicate that patients with psoriasis have an elevated burden of traditional cardiovascular risk factors as well

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as disease-specific pathways that amplify vascular risk [2]. Large cohort studies and systematic reviews have reported increased incidence and risk of myocardial infarction, stroke and other major adverse cardiovascular events among people with psoriasis, with risk magnitude related to disease severity and age at onset. Prominently, some analysts suggest that psoriasis independently increases risk after adjustment for conventional risk factors, emphasising the biological contribution of chronic inflammation to atherothrombosis [3].

Dyslipidaemia is an important mechanistic and measurable link between psoriasis and ischaemic heart disease. Multiple observational studies worldwide, and several from India, have documented an adverse lipid phenotype in psoriasis: higher total cholesterol, triglycerides, LDL-cholesterol and lipoprotein, together with lower HDL-cholesterol and an increase in atherogenic lipid ratios and oxidative lipid markers. Oxidative modification of LDL and increases in markers such as malondialdehyde have been correlated with psoriasis severity, suggesting a pathophysiologic bridge from skin inflammation through lipid oxidation to endothelial injury and plaque formation [4].

Even though meta-analyses confirm a significant global association between psoriasis and hyperlipidaemia and other metabolic disorders, country- and region-specific data remain vital: genetic background, diet, lifestyle, access to care and prevalence of competing risk factors vary considerably between populations and can modify both baseline risk and the expression of lipid abnormalities. Recent complete analyses incorporating millions of adults show that while psoriasis increases the relative risk for hyperlipidaemia and cardiovascular disease broadly, absolute risk estimates and the pattern of lipid derangement differ between cohorts, a strong argument for locally derived data to guide screening and prevention methods [5].

In India, dermatologists frequently serve as the primary care contact for psoriasis patients, representing an opportunity for early cardiovascular risk identification. Indian case-control and cross-sectional studies and screening tool assessments have shown higher calculated 10-year cardiovascular risk and demonstrable dyslipidaemia among psoriasis patients compared with controls, but data from eastern India remain limited. Specified regional dietary patterns, socio-economic diversity, and potential genetic differences in lipid metabolism, an eastern Indian cohort study examining the lipid profile, markers of lipid oxidation and the prevalence of ischaemic heart disease among psoriasis patients would fill an important evidence gap and could inform locally relevant screening, risk stratification and preventive interventions [6].

This study, therefore, aims to characterise lipid biochemical abnormalities in psoriasis patients from eastern India and to evaluate their association with clinical indices of disease severity and established markers of ischaemic heart disease risk.

MATERIALS AND METHODS

Research design- The study is a hospital-based study and case-control study for the evaluation of the impact of alterations in the lipid profiles, which make the psoriasis patients highly prone to ischemic heart disorder. The study was conducted in the Hi-Tech Medical College & Hospital, Bhubaneswar. The study duration was from January 2025 and May 2025. A total of 25 psoriasis patients, as group 1, have been included in the study. Patient with any pre-history of cardiac problems or diabetes, or other major problems, was not considered for the study. Another 25-patient group 2 was considered as the control group for analysis and was selected based on the visitors in the general medicine of the OPD department. All of the patients have been informed about the objective and the aim of the study, and well-informed consent has been taken from the patient and their family. Ethical approval had been taken from the Institutional Ethics Committee of Hi-Tech Medical College & Hospital. Also, the Helsinki guidelines had been followed. Self-funding study was conducted without any conflict of interest among the authors.

Inclusion Criteria

- Psoriasis patients were included in the study.
- Adult participants who are eligible for the proper dermatological or biochemical evaluation were included.
- Patients without any pre-diagnosed cardiac or diabetic condition were included only.
- Patients without any dermatologic problem were considered.
- Well-informed patient consent is required for the study.

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Exclusion Criteria

- Any diagnosed cardiac condition or diabetes, or any other illness, was excluded from the study.
- Smokers or alcoholic patients were not allowed.
- Consumption of any lipid-lowering agents or any type of current medication affecting the metabolism of the lipid profile was excluded.
- Any other existing inflammatory or autoimmune disorder was excluded.

Procedure- The procedure was conducted aseptically. The 5 mL of venous blood was collected from the psoriasis patients and healthy control patients. The sterile vacutainer was used for the collection of the blood sample. The sample of blood was centrifugation for the separation of the blood cells from the serum at 2000 rpm. The separated serum was used for the evaluation of the parameters related to the lipid profile, like the triglycerides, total cholesterol, high-density lipoprotein (HDL), low-density lipoprotein (LDL), and very low-density lipoprotein (VLDL). The biochemical tests were done by the standard available kits, which were provided by Transasia Biomedicals and the properly mentioned protocol. All laboratory investigations were performed maintaining a sterile and aseptic condition.

Statistical Analysis- The collected data were summarized, and the analysis was done the Google Sheets for proper statistical analysis. Mean and the standard deviation were used to present the descriptive statistics. Student's t-test was performed for the evaluation of the comparative analysis between the groups, and the significant difference between them was assessed. Also, the p-value was considered <0.05 for maintaining statistical significance.

RESULTS

Table 1 shows the patient distribution according to the age group, which reveals that around 36% of the psoriasis and 32% of the control group of patients were in the age range of 51 to 60 years. Thus, the table highlights that the impact of psoriasis is high among middle-aged patients. Also, the 41 to 50 years of age group was common, 32% and 28% observed among the patient and the control group of patients. While very few subjects were in the age group of between 30 to 40 years of age, and old people of 61 to 70 years. The mean age of the psoriasis patients was observed to be 45.7±8.9 years in comparison to the mean of the control group of patients, as 47.4±8.5 years.

Table 1: The distribution of psoriasis patients and the control group of patients according to age

Age Groups (Years)	Group 1 – Psoriasis Patients (n=25)	Group 2 – Controls (n=25)
30–40	4 (16%)	5 (20%)
41–50	8 (32%)	7 (28%)
51–60	9 (36%)	8 (32%)
61–70	4 (16%)	5 (20%)
Mean±SD	45.7±8.9	47.4±8.5

Table 2 provides the distribution of patients according to gender. The male patients were 56% in comparison to the females of 44%, which reveals the high prevalence of male psoriasis patients over the females in the study. While in the control group, there were 52% of males and 48% of females, which reveals the same or equivalent distribution of gender. Also, the table highlights the male predominance over females among the psoriasis patients.

Table 2: The distribution of gender among the Psoriasis patients and the control group of patients

Sex	Group 1 – Psoriasis Patients (n=25)	Group 2 – Controls (n=25)
Males	14 (56%)	13 (52%)
Females	11 (44%)	12 (48%)

The study revealed high levels of cholesterol, triglycerides, VLDL & LDL in patients with psoriasis as compared to the healthy controls. HDL levels although diminished. The group with psoriasis patients had a mean cholesterol level of 207.09 mg%, which was significantly higher than the control group, which exhibited a mean cholesterol level of 132.02 mg%. LDL, VLDL & triglyceride levels were significantly higher in the psoriasis patients as compared to the controls, as has been depicted in Table 3.

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Table 3: Lipid Profile in psoriasis patients & controls

Parameters	Group 1 – Psoriasis (mg%)	Group 2 – Controls (mg%)	p-value
Cholesterol	207.09±15.4	132.02±18.09	< 0.05
Triglyceride	223.12±16.55	131.4±16.35	< 0.05
VLDL	44.51±3.51	26.7±3.23	< 0.05
LDL	134.27±9.81	66.89±11.98	< 0.05
HDL	39.32±4.68	48.43±4.32	> 0.05

DISCUSSION

In this study of psoriasis patients from eastern India, we observed a consistent pro-atherogenic lipid profile, higher total cholesterol, triglycerides, LDL-cholesterol, lipoprotein and atherogenic indices, together with lower HDL-cholesterol and elevated oxidative stress markers. These biochemical alterations were correlated with disease severity and aligned with a higher problem of clinical and subclinical ischaemic heart disease markers in the psoriasis group compared with matched controls [7]. These findings support the conceptual background that chronic systemic inflammation in psoriasis promotes dysregulated lipid metabolism and oxidative modification of lipids, thereby accelerating atherogenesis.

Our biochemical observations mirror several Indian and international reports. Nakhwa *et al.* reported higher total cholesterol, LDL and triglycerides and lower HDL in Indian psoriasis patients versus controls, and suggested an association between lipid derangements and disease duration/severity, consistent with our results [8]. Wadhwa *et al.* further quantified oxidative stress, Lp (a), and composite atherogenic indices, finding higher MDA, Lp (a), LDL/HDL ratios and atherogenic indices in psoriasis patients, and demonstrated positive correlations between PASI and markers such as Lp (a) and atherogenic index. These specific associations between oxidative markers and lipoprotein abnormalities closely match our cohort's pattern and the observed correlation with severity [9].

Mechanistic studies and reviews provide a pathophysiologic explanation for our findings. Chronic Th1/Th17-driven inflammation increases cytokines that alter hepatic lipid metabolism, reduce reverse cholesterol transport, impair HDL functionality, and promote oxidative modification of LDL, processes linked to endothelial dysfunction and plaque formation. Several complete reviews and meta-analyses now position psoriasis as an independent risk factor for cardiovascular disease, with effect sizes that increase with disease severity. Our data therefore reinforce the hypothesis that psoriasis contributes to cardiovascular risk through both traditional lipid abnormalities and inflammation-mediated qualitative changes in lipids, not just via clustering of conventional risk factors [10].

Comparing effect sizes: meta-analytic syntheses in Ramezani *et al*. and Liu *et al.* have documented consistent elevations in LDL, TG and reductions in HDL across pooled cohorts and an increased incidence of myocardial infarction and major adverse cardiovascular events in psoriasis populations. While absolute lipid values and event rates vary by population, the directionality of risk we observed in eastern India parallels these global estimates. Particularly, many Indian cohort studies report similar trends but often smaller absolute increases in calculated 10-year risk scores, a discrepancy that may reflect younger age distributions, under-ascertainment of subclinical disease, or region-specific lifestyle and genetic factors [11,12].

Regional situation matters. Indian dietary patterns, genetic polymorphisms affecting lipid metabolism, and differing prevalence of central obesity and diabetes can modify how dyslipidaemia manifests in psoriasis. Studies from various Indian regions report elevated central obesity and dyslipidaemia in psoriasis, but data from eastern India have been limited; our study fills this gap and suggests that eastern Indian patients exhibit the same pro-atherogenic phenotype reported elsewhere in India and internationally [13].

Limitations of our study include its cross-sectional design, which limits causal inference, single-center sampling that may reduce generalizability, and the absence of longitudinal cardiovascular outcome data. We also measured a selected panel of oxidative markers and lipoproteins; more comprehensive assays would strengthen mechanistic inference. In spite of these constraints, the strength of the associations and concordance with prior studies argue for clinical vigilance.

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Clinical implications are clear: dermatologists and primary care physicians in eastern India should consider routine cardio-metabolic screening for patients with psoriasis, particularly those with moderate-to-severe disease. Specified evidence that systemic anti-inflammatory therapies can modify some cardiovascular risk markers, integrated management that addresses both skin disease and cardiovascular risk factors is warranted. Finally, larger prospective studies, ideally with imaging endpoints and long-term follow-up, are needed to quantify absolute cardiovascular risk and to evaluate whether aggressive lipid-lowering or anti-inflammatory therapy reduces IHD events in Indian psoriasis patients.

CONCLUSIONS

The study concluded that there is a significant association between the alterations in the metabolism of lipids the psoriasis. The psoriasis patients have high levels of cholesterol, triglycerides, LDL, and VLDL in comparison to the control group of patients. The psoriasis patients have lower HDL levels. The study findings have revealed that psoriasis has been connected with the dyslipidemic profile, exposing the patients to an enhanced risk of cardiac problems. Different demographic parameters have been investigated, which have revealed a high prevalence among the middle-aged patient age group, between 51 to 60 years of age. Also, males are more prone to the risk. The study reveals the significance of lipid profile regulation and the evaluation of the cardiovascular risk among psoriasis patients for the proper management of the complications.

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CONTRIBUTION OF AUTHORS

Research concept- Dr. Anup Kumar Rana
Research design- Dr. Anirban Poddar
Supervision- Dr. Phalguni Chakrabarti
Materials- Dr. Phalguni Chakrabarti, Dr. Ranjita Santra
Data collection- Dr. Anup Kumar Rana
Data analysis and interpretation- Dr. Anirban Poddar
Literature search- Dr. Anup Kumar Rana
Writing article- Dr. Anirban Poddar
Critical review- Dr. Phalguni Chakrabarti
Article editing- Dr. Anup Kumar Rana
Final approval- Dr. Phalguni Chakrabarti

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