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Original Research Article

Psoriasis Patient in Bihar with Elevated Serum Lipid and Lipoprotein Levels

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Abstract

Introduction: Psoriasis is a chronic, inflammatory, and proliferative skin condition characterized by improper lipid metabolism. Genetic, environmental, viral, infectious, immunological, biochemical, hormonal, and psychological variables, as well as alcohol and drug misuse, all influence its prevalence in the community. The frequency of cardiovascular problems in these patients is significantly greater than in the general population, which appears to be related to hyperlipidemia. The purpose of this study was to examine the blood lipid and lipoprotein profile levels in psoriatic patients to determine their relationship with disease severity.

Methodology: The study was conducted on 200 people with psoriasis who were over the age of 18. Total cholesterol, Triglyceride, HDL, and LDL lipid levels were measured. The Psoriasis Area Severity Index was used to determine the severity of the psoriasis (PASI). The relationship between Psoriasis severity and lipid levels was investigated. SPSS 21.0 was used to examine the data. To compare the results, ANOVA and Pearson correlation coefficients were employed.

Result: The average age of the patients was 39.4 ±16.6 years. The majority of patients (66.7%) were men. The mean total cholesterol, triglyceride, LDL, and HDL values were correspondingly 151.52 ±39.39, 152.53 ±85.43, 77.46 ±34.34, and 43.98 ±16.43 mg/dl. According to PASI, 9 (15%) people had mild psoriasis, 35 (58.3%) had moderate psoriasis, and 16 (26.7%) had severe psoriasis. Mean total cholesterol, triglyceride, and LDL levels increased with increasing PASI severity grade; however, the correlation was statistically significant only for total cholesterol and triglyceride levels.

Conclusion: The current study's results indicated that psoriasis affects lipid levels and that severity is associated with higher lipid levels, meaning that those with higher grades of psoriasis have a higher chance of developing cardiovascular disease.

Keywords: Psoriasis, Serum Lipid, Lipoprotein Levels, Triglyceride, Cardiovascular Risk.

Introduction

Psoriasis is a chronic inflammatory skin condition characterised by erythematous scaly plaques on the body's extensor surfaces and the scalp [1]. It is an

autoimmune disorder with no recognised aetiology.It affects 2-3% of the global population [2]. Psoriasis pathogenesis involves an increase in antigen presentation by dendritic cells, antigen presentation to T cells, T-cell activation, and production of type 1 (TH1) cytokines by these cells [3,4]. Enhanced dendritic cell antigen presentation and presentation to T-lymphocytes results in the following changes: T-cell activation and production of type 1 (TH1) cytokines such as interferon, interleukin-2, and tumour necrosis factor alpha (TNF-a). These cytokines cause epidermal inflammation, resulting in thick scaly plaques. Psoriasis is a systemic inflammatory disease that causes a variety of problems and co-morbidities that have a substantial influence on patients' health and quality of life [5].

Early cardiovascular mortality in psoriatic individuals have been recorded as compared to the general population. This might be due to the fact that risk factors for cardiovascular disease and metabolic syndrome appear to be more frequent in psoriasis patients than in the general population, leading to accelerated atherosclerosis and coronary heart disease. Obesity, smoking, diabetes, hypertension, and dyslipidemia are all risk factors [5,6]. In addition, there is increased oxidative stress, which is associated with a high prevalence of cardiovascular disease [7-9]. The high prevalence of cardiovascular events is connected to the severity of the illness, which happens more frequently in people with psoriasis lesions on broad parts of the body. While hyperlipidemia is one of the risk factors for cardiovascular disease, the results are mixed [10]. Many investigations have found that psoriatic individuals have a proatherogenic lipid profile, with elevated levels of blood TGL, TC, including LDL and VLDL cholesterol, and decreased levels of cardioprotective HDL cholesterol [11,12]. The main aim of this research was to measure the serum lipid profile of psoriatic patients and compare the mean to the lipid profile of healthy controls after controlling for other hyperlipidaemia risk factors such as increased smoking, hypertension, diabetes, alcoholics, hepatic or renal diseases, and drugs that cause hyperlipidaemia.

Methodology

The below study was performed at Department of Biochemistry, Darbhanga Medical College and Hospital, Darbhanga in Bihar as a retrospective chart review of all adult psoriasis patients aged >18 years who visited the institution for psoriasis therapy in the previous year. Demographic information (age and gender), weight and height (for BMI calculation), lipid profile, and psoriasis severity (as measured by PASI) were all collected. Only instances with comprehensive records on the required details were registered. There were a total of 200 such records found.

The severity of psoriasis was determined using the Psoriasis Area Severity Index (PASI) [13]. PASI has a range of 0-72 and is computed as follows:

	Thickness 0–4	**Scaling 0–4**	**Erythma 0–4**	**× Area 0–6 total**	**Total**
Head	a	b	c	d(a+b+c) ×0.1	A
Upper limbs (Axillae)	e	f	g	h(e+f+g) × 0.2	B
Trunk (Neck/buttocks)	i	j	k	l(i+j+k) × 0.3	C
Lower limbs (Genito-femoral)	m	n	o	p(m+n+o)×0.4	D

Where, 0-4 scaling for severity of thickness, scaling and erythema is as follows:

0 = none; 1 = mild; 2 = moderate; 3 = severe; 4 = Very severe.

And, 0-6 grading of area is as follows:

0 = no involvement 1 = <100%; 2 = <30%; 3= <50%; 4= <70%; 5= <90%; 6 = <100%.

Results

The participants in the research varied in age from 18 to 80 years. The average age of the patients was 39.4±16.6 years. The majority of patients (66.7%) were men. The study population had a male-to-female ratio of 2:1. Patients' body mass index (BMI) varied from 20.1 to 34.4 kg/m. Patients' mean BMI was 26.883.38 kg/m. The range of total cholesterol (TC) readings was 89 to 258 mg/dl. The levels of triglycerides (TG) varied from 61 to 453 mg/dl. Low density lipoprotein (LDL) values varied from 24 to 187.9 mg/dl, whereas HDL levels ranged from 20 to 107 mg/dl. The PASI varied from 2.5 to 27.2. The mean total cholesterol, triglyceride, LDL, and HDL values were correspondingly 151.52±39.39, 152.53±85.43, 77.46±34.34, and 43.98± 16.43 mg/dl [Table 1].

Table 1: General Characterists and Lipid Profile of Patients with Psoriasis

S. No.	Characteristics	Statistic
1.	Mean Age±SD (Range) years	39.4±16.6 (18-80)
2.	Male:Female	40 (66.7%):20 (34.3%)
3.	Mean BMI±SD (Range) kg/m	26.88±3.38 (20.2-34.4)
4.	Mean total cholesterol±SD (Range) mg/dl	151.52±39.39 (90-258)
5.	Mean triglyceride±SD (Range) mg/dl	152.53±85.43 (62-453)
6.	Mean Low Density Lipoprotein±SD (Range) mg/dl	77.46±34.34 (25-187.9)
7.	Mean High Density Lipoprotein±SD (Range) mg/dl	43.98±16.43 (21-107)
8.	Mean PASI±SD (Range)	8.62±4.19 (2.7-27.2)

According to Psoriasis Area Severity Index, 46 people (16.0%) had mild psoriasis, 95 (59.4%), moderate psoriasis, and 50 (27.8%) had severe psoriasis [Table 2].

Table 2: Cases Based on Psoriasis Severity

S. No.	Severity	PASI Score range	No. of cases	Percentage
1.	Mild	<5	46	16.0
2.	Moderate	5-10	95	59.4
3.	Severe	>10	50	27.8

The mean total cholesterol levels for mild, moderate, and severe psoriasis were reported to be 129.88 ± 29.97, 147.73 ± 36.99, and 175.73±42.96 mg/dl, respectively. Triglyceride levels were reported to be 92.32±30.88, 141.30±70.32, and 215.10 ±116.26 mg/dl for mild, moderate, and severe psoriasis, respectively. For mild, moderate, and severe psoriasis, mean LDL values were 69.66±38.63, 78.48±32.62, and 92.05±53.18 mg/dl, respectively. The mean HDL values for mild, moderate, and severe psoriasis were 43.10±13.10, 42.27±14.97, and 50.7 ±22.76, respectively. With increasing psoriasis severity, there was a steady incremental trend in total cholesterol, triglyceride, and low density lipoprotein values. Those with severe psoriasis had greater levels of high density lipoprotein than those with mild or moderate psoriasis. However, only total cholesterol and triglyceride levels showed a statistically meaningful relationship with psoriasis severity.

When a bivariate correlation of serum lipid levels with psoriasis severity and psoriasis area severity index was examined, there was a significant positive connection between PASI and total cholesterol (r=0.369; p=0.048) and between PASI and Triglyceride (r=0.468; p=0.005) [Table 3].

Table 3: Relationship between PASI and Lipid Levels

S. No.	Parameter	'r'	'p'
1.	Total cholesterol	0.369	0.048
2.	Triglyceride	0.468	0.005
3.	LDL	0.053	0847
4.	HDL	0.271	0.293

Discussion

Lipid alterations have been reported to be relatively prevalent in psoriasis patients [14,15]. One of the related diseases in psoriasis patients is dyslipidemia [16]. Furthermore, alterations in lipid metabolism are thought to have a vital function in the etiopathogenesis of psoriasis. Psoriasis as a skin disorder is frequently thought to be analogous to xanthomatosis, which is thought to be caused by lipid abnormalities [17,18,19]. A study of phospholipid composition alterations in psoriatic plaque demonstrated a relationship between in ammation, congestion, and parakeratosis as a result of lipid deposition in the reticular endothelial system [20]. The study of variations in phospholipid composition in psoriatic plaque indicated a relationship between inflammation, congestion, and parakeratosis and lipid deposition in the reticular endothelium system. A number of research papers have found that psoriasis patients had significantly higher lipid levels than controls [21,22]. Expanding this association to disease severity, we investigated the relationship of psoriasis severity with lipid levels in the current study and discovered that, with the exception of HDL, all lipids exhibited an incremental trend with increasing psoriasis severity. In terms of HDL levels, they have been observed to be lower in psoriasis sufferers when compared to controls. Expanding this association to disease severity, we investigated the relationship of psoriasis severity with lipid levels in the proposed investigation and discovered that, with the exception of HDL, all lipids exhibited an incremental trend with increasing psoriasis severity. In terms of HDL levels, they have been observed to be lower in psoriasis patients when compared to controls [23,24]. In the present research, we discovered a random link between HDL levels and the severity of psoriasis, with the mean levels of severe psoriasis being the highest, followed by mild and moderate grades, respectively; although, these random trends did not turn out to be statistically significant. Gender is also known to influence HDL levels. As we analysed our data, we discovered that the majority of the patients with severe psoriasis were men, which might explain the higher mean HDL values in our research. In the event of a research population with a variable relative representation of gender in different degrees of psoriasis, the putative correlation of HDL with gender may be distorted.

Secondly, in the current investigation, we discovered that total cholesterol and triglyceride levels were significantly related to the severity of psoriasis. Similar to the current study, Ku et al. [25] discovered that mean total cholesterol, triglyceride, and LDL levels in moderate and severe psoriasis patients were higher than in mild psoriasis patients, but only for triglyceride levels. In another study, Gupta et al. [26] used a control group as the reference group and found statistically significant changes in total cholesterol and HDL levels between controls and moderate psoriasis patients, but not in triglyceride and LDL levels. However, when they compared cases of moderate to severe psoriasis to controls, they found significant variations in all lipid parameters between patients and controls.

In the current study, we also discovered that total cholesterol and triglyceride levels exhibit a significant incremental trend with increasing severity, indicating that lipid levels are not only implicated in the etiopathogenesis of psoriasis, but also in its progression. Srinivas et al. [27] discovered a much stronger relationship between psoriasis severity and lipid levels, observing significant incremental trends for all lipids (TC, TG, and LDL) with increasing psoriasis severity except for HDL, which showed a significant decreasing trend with increasing psoriasis severity. Nevertheless, in the current study, we could only observe such trends for total cholesterol and triglyceride levels.

Conclusion

The current study's results indicated that psoriasis affects lipid levels and that severity is associated with higher lipid levels, meaning that those with higher grades of psoriasis have a higher chance of developing cardiovascular disease. We also discovered a slight positive and significant connection between total cholesterol levels and PASI scores in this investigation. There was also a mildly favourable and significant connection between triglyceride and PASI scores. As a result, we could not find a substantial association between lipid levels and PASI scores, indicating that psoriasis is a complex condition that cannot be adequately explained just by changes in lipid levels. However, lipid levels appear to have a significant connection with clinical manifestations of psoriasis, as previously hypothesised in several research. Further research on the multifactorial link between psoriasis and lapioprotein severity is needed, with a bigger sample size and the inclusion of a control group of people and other metabolic parameters that contribute to psoriasis aetiology.

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