Original article

Serum Lipoproteins in Psoriasis-A Pilot Study at a Tertiary care teaching Hospital

[1]Madhava Sai S, [2]Haritha S, [3]Vijayalakshmi U B

[1]3rd Year Student M.B.B.S. , [2]HOD and Professor of Dermatology , [3]Professor of Biochemistry

Name of the Institute/college: Dr.Pinnamaneni Siddhartha Institute of Medical Sciences and Research Foundation

Corresponding author: Madhava Sai S

ABSTRACT

Introduction: Psoriasis is an inflammatory dermatosis that is characterized with hyperproliferation of prevalence of atherosclerosis has been reported in psoriatic patients. High serum lipid level has been suggested in the pathogenesis of this phenomenon. In this study, our purpose was to compare the lipid profile in psoriatic patients with non-affected persons. Psoriasis is known to be associated with metabolic syndrome and studies have found discordant results of lipid profile in psoriasis. Hence this aims to study lipid profile in patients with psoriasis.

Methods: This study was designed and conducted as a cross-sectional case–control study with 30 cases each in the patient and control groups, respectively. The fasting lipid profile, including serum level of triglyceride, cholesterol(TC), low-density lipoprotein(LDL), high-density lipoprotein (HDL), and random blood glucose were assessed in both groups.

Observation and Results: The patients and controls groups consisted of 30 cases each showed a highly significant increase in total cholesterol (TC) and low-density lipoprotiens (LDL) in the cases compared to control groups $p<0.01$ but no significance in high-density lipoprotiens (HDL) $p=0.18$, triglycirides (TG) $p=0.34$. The PASI scores did not show any relation with the lipid profile values.

Conclusion: This study, like previous studies, shows that high serum lipid level is significantly more common in psoriasis. This fact may be responsible for higher prevalence of cardiovascular diseases in psoriatic patients. It may be useful to do early screening and treatment of hyperlipidaemia in psoriasis to prevent the atherosclerosis and its complications.

Key words: psoriasis, total cholesterol, low-density lipoprotien.

Introduction:

Psoriasis is a chronic, recurrent, inflammatory skin disorder associated with systemic effects. It is recently been considered an immuno metabolic disorder. It is associated with cardiac comorbidity, hypertension dyslipidemia, atherosclerosis, type 2 diabetes mellitus, obesity, chronic obstructive pulmonary disease, cerebral stroke, osteoporosis, cancer and depression [1]. It affects approximately 120-180 million people worldwide and 150,000 new cases are reported annually. The population prevalence of psoriasis has been found to range from 2-3% [2]. Most of the research in India regarding the prevalence of psoriasis is on a hospital based population and varies from 0.44 to 2.8% [3]. It is twice as common in males compared to females. Most of the patients are at the third or fourth decade of life at the time of presentation[4]. Several studies have demonstrated abnormally elevated lipid profile pattern in psoriasis but there are conflicting results with other studies reporting no such association[5-7]. Lipid metabolism studies on psoriasis were been done from the beginning of 20th century and abnormal lipid metabolism was considered to be an important factor in the etiology of psoriasis[8]. Hypertriglyceridemia, raised serum low density lipoprotein and low high density lipoprotein concentration has been associated with

psoriasis. These changes in lipoprotein levels in patients with psoriasis may be the cause for increased preponderance of atherosclerosis[9-11]. Therefore there is a need to study lipid profile abnormalities in patients with psoriasis so that the risk of these individuals developing atherosclerosis and cardiovascular co morbidity can be evaluated. The present study was designed to look for an association between the lipid profile and psoriasis in these patients.

Aim and objectives:

1. To study the lipid profile in patients with psoriasis.
2. To look for any lipid profile changes in these patients in relation to the psoriasis area and severity index (PASI).

Material and Methods:

This study was conducted in the department of dermatology at a tertiary care teaching hospital in rural Andhra Pradesh. It was designed as a case control, cross sectional study that included 30 subjects with psoriasis vulgaris and 30 age and sex matched controls without psoriasis. The subjects with diseases that can cause secondary hyperlipidaemia, such as hypothyroidism, diabetes mellitus, nephrotic syndrome, chronic renal insufficiency, obstructive liver disease, and connective tissue disease, as well as patients on medications, such as beta blockers, thiazides, corticosteroids, retinoids, cyclosporin, and lipid-lowering agents, in the recent 6 months were excluded. Pregnant and lactating women and subjects with body mass index (BMI) above 30 kg/m^2 were excluded. After a 12 hour fast 2 ml of blood was collected from these patients using a vacutainer with clot activator and after 30 minutes serum was separated. Then the serum was analysed for total cholesterol (TC), triglycerides (TG), high density lipoprotein(HDL) using standardised kits on a fully automated clinical chemistry analyser after running appropriate quality controls. Serum low density lipoprotein (LDL) was calculated by Freidewald's formula (TC- (TG/5 + HDL). All the values are in milligrams per decilitre (mg/dl).Standard height was measured using a commercial stadiometer. A digital scale with an accuracy of ±100 g was used to measure body weight in kilograms (kg). Body mass index was calculated (weight in kg/height in square metres). The consultant dermatologist diagnosed psoriasis and calculated the PASI score to know the severity of the disease. The score was graded as mild, moderate and severe for PASI values <3, 3-10 and >10 respectively. The socio demographic data, clinical history and examination and investigations were recorded on a proforma. Informed consent was taken from the subjects and institutional ethical committee gave the clearance for the study. The collected data was analysed using SPSS software.

Observation and Results:

Table 1.

Descriptive statistics of Age					
Group	**N**	**Min**	**Max**	**Mean**	**SD**
Case	30	25	72	44.32	13.72
Control	30	22	60	46.76	11.02
Total	60	22	72	45.54	12.38

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Table 2.

Group	Sex		Total
	Female	Male	
Case	12	18	30
	40%	60%	100%
Control	8	22	30
	27%	73%	100%
Total	20	40	60
	33%	67%	100%

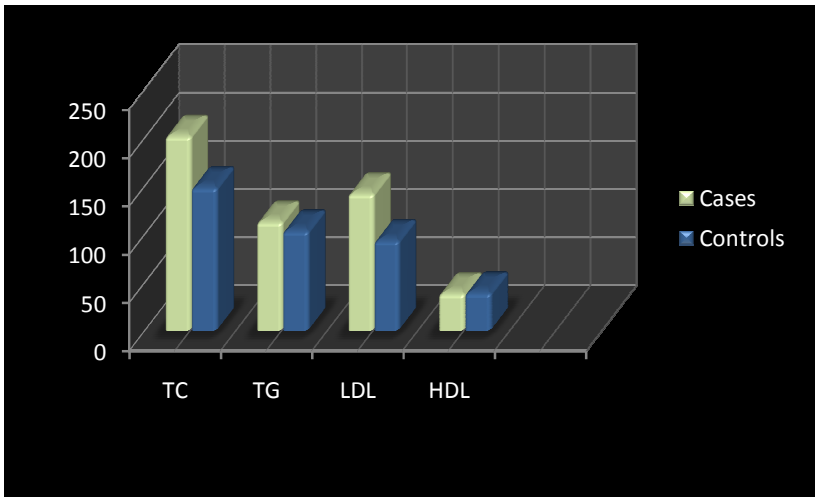
Table 3 Comparison between the groups

Variable	Group										p-value
	Case					Control					
	N	Min	Max	Mean	SD	N	Min	Max	Mean	SD	
TC	30	149	245	200.52	28.45	25	108	186	147.12	19.64	<0.01 HS
TG	30	74	187	111.68	34.35	25	60	152	102.32	29.50	0.34 NS
LDL	30	95	190	140.92	28.23	25	47	125	92.16	18.95	<0.01 HS
HDL	30	32	45	37.40	3.23	25	32	42	37.96	2.35	0.18 NS
PASI	30	0.6	27.8	10.45	8.31						

Table 4 Variables relation with PASI

Variable	r	p-value	Inference
TC	0.33	0.11	NS
TG	-0.2	0.34	NS
LDL	0.37	0.07	NS
HDL	-0.09	0.97	NS

Figure 1. Graphical representation of lipid profile in cases and controls.



Thirty subjects attending the dermatology outpatient department at our hospital who fulfilled the inclusion criteria and did not fulfil the exclusion criteria were included in the study. Thirty age and sex matched controls were included for comparison who were patients attending the dermatology department for cosmetic problems like acne. The socio demographic data showed that there were more males when compared to females (Table 1, 2). The analysis of lipid profile in the serum revealed that total cholesterol and LDL were significantly elevated but there was no difference in the triglycerides and HDL values (Table 3, Fig.1). The mean PASI scores were 10.45± 8.31 and did not show any relation with the lipid profile values (Table 4). The mean duration of psoriasis was 64.9 months ± 25.4.

Discussion:

Psoriasis is recognised as a systemic disease with multiorgan involvement. It is found to increase the risk of having cardiovascular disease, type 2 diabetes mellitus, obesity, atherosclerosis, dyslipidemia, stroke, chronic obstructive pulmonary disease, osteoporosis, cancer and depression[1-4]. There are several observational studies on altered lipid metabolism in psoriasis. Most of the studies show conflicting results [9-12]. Several studies show increased serum TC, TG concentrations and normal serum HDL. But other studies show a normal serum TC and low serum HDL values. Most studies also show increased serum LDL, which is a highly atherogenic lipoprotein[12].

A large population based study by Dreiher et al reported that dyslipidemia was prevalent in patients with psoriasis. The odds ratio being 1.48 and the association remained significant after controlling for the confounding variables. The study reported high serum TG and low HDL but TC and LDL were not statistically significant[13]. In our study there was increased TC and LDL but no difference in the TG and HDL values in cases and controls. Bhatia et al in their study also found increased statistically significant increase in TC, LDL and HDL but not in TG. This was a cross sectional study with 94 patients with psoriasis vulgaris and 103 controls. They concluded that the dyslipidemia could be the reason for increased cardiovascular disease seen in these patients[4]. Banerjee et al in their study on a hospital based population in Pune

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observed that serum TC and TG were significantly elevated in the cases when compared to controls but no such change was seen in the LDL and HDL values. They also found elevated C reactive protein in patients with psoriasis[14]. Another study by Javidi et al reported on 60 patients with psoriasis and 120 age and sex matched controls observed that there was statistically significant increase in TC, TG and LDL but no change in the HDL values [15].

The lipid metabolism disorders in psoriasis have been studied since the beginning of the 20th century. It is still unclear whether the lipid abnormalities are the primary events in psoriasis or secondary to the disease or to the medications used like cyclosporins or retinoids[13]. Some authors suggested that continuous separation of psoriatic scales caused the lipid abnormalities seen in the disorder. Psoriasis is a chronic inflammatory disorder and it has been suggested that it could be an autoimmune disease. Clinical and experimental studies support the role of Th-1(T helper) and Th17 cells in psoriasis. The inflammation is driven by T cell cytokines like TNF- α (Tumor necrosis factor), IL-6 (Interleukin), IL-8, IFN-γ (Interferon), IL-1, IL-17 that lead to proatheromatous conditions like dyslipidemia, insulin resistance, endothelial dysfunction, clotting system activation and pro-oxidative stress. It was found that treatment with TNF-α inhibitors increased HDL levels. Auto antibodies recognizing oxidized LDL were found in subjects with psoriasis and the level of these antibodies correlated with the disease severity. Some evidence indicates that HDL is modified in these individuals and the modified HDL was found in atherosclerotic plaques. This modified HDL has no beneficial effects and also has proatherogenic activity and inhibits nitric oxide(NO) synthesis in endothelial cells[16,17]. The lipid abnormalities may facilitate and maintain inflammatory reaction in the skin[18]. Some studies claim that the lipid profile changes may be due to structural and functional abnormalities of the gastrointestinal tract. Such changes have been reported in psoriatic patients[19]. Whatever be the reason for dyslipidemia, it leads to atherosclerosis and its corollary coronary artery disease and cerebrovascular disease.

Conclusion:

The present study has shown that there is an association between dyslipidemia and psoriasis. But the study design precludes any knowledge of the causation of the abnormal lipid profile. Lipoprotein abnormalities should be kept in mind when treating patients with psoriasis as it leads to atherosclerosis and increases the risk for cardiovascular disease. The causation of lipid profile abnormalities require a prospective study design, with follow up of patients with psoriasis without dyslipidemia.

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