



Lipid Profile in Psoriasis

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ABSTRACT

Background: Psoriasis is a common chronic inflammatory skin disorder associated with multiple comorbidities and significant effect in quality of life. Multiple comorbidities including disorders of lipid and lipoprotein, oxidative stress as well as metabolic syndrome has been found to be associated with psoriasis. There are several researches on lipid profile and psoriasis but the result is not consistent.

Objective: To determine the lipid profile in patients with psoriasis and to compare it with healthy controls and to determine relation between lipid abnormalities and duration of disease & severity of psoriasis (graded by Psoriasis Area Severity Index, PASI).

Methods: A comparative cross-sectional study was conducted among 71 cases and 71 control from 1st Oct 2019 to 31st Sep 2020 in the Department of Dermatology and Venereology, Koshi Hospital, biratnagar, Nepal to compare the lipid profile among patients with psoriasis and healthy controls.

Result: Serum Total Cholesterol and Low-Density Lipoprotein Cholesterol was significantly higher in patient with psoriasis as compared to control (165.65± 36.18 vs 147.90±32.84, p<0.001). A significant correlation was observed between severity of disease measured by PASI and TC (r=0.274, p=0.021) and LDL-Cholesterol (r=0.248, p=0.037).

Conclusion: Patients with psoriasis have significantly high lipid abnormalities in terms of increased total cholesterol and LDL cholesterol. Dyslipidemias found in them paralleled with disease severity and durations. Early screening and treatment of hyperlipidemia in patients with psoriasis is advised to prevent atherosclerosis and its complications in them.

Key words: Dyslipidemia, PASI, lipid profile, Psoriasis.

INTRODUCTION

Psoriasis is a common chronic inflammatory skin disorder characterized by well demarcated erythematous plaques with silvery white scales predominantly involving the extensors, scalp and lumbar area (1). A wide variation in prevalence between 0.7% and 8.5 % has been reported with average of 2-4% among western countries (2).

The pathophysiology of psoriasis includes upregulation and activation of T-cell and secretion of Type1(Th1) cytokines by these cells (3). Besides being a debilitating skin ailment, previous studies have linked psoriasis with a number of behavioral and systemic comorbidities and has been associated

with a large impact on health-related quality of life (4). Several observational studies suggest that patients with psoriasis are at high risk of cardiovascular disease compared with individual without psoriasis. Multiple factors, including aberrant lipid and lipoprotein profiles, increased oxidative stress, decreased antioxidant capacity and other established risk factors, such as hypertension, obesity, and diabetes mellitus, have been associated with psoriasis (5). Medication used to treat psoriasis may increase the risk of dyslipidemia and cardiovascular risk in patients with psoriasis (6).

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Review of literature suggest that person with psoriasis have abnormal lipid profile. But these studies are not consistent and most of the studies have not taken the severity of psoriasis into account. Lipid profile derangement can be one of the important factors that can cause comorbidity in psoriatic patients. So, this study was attempted to find out the association of lipid abnormality in patients with psoriasis.

MATERIAL AND METHODS

This study was conducted at department of dermatology, Koshi hospital, Biratnagar, over the period of 12 months from 1st Oct 2019 to 31st Sep 2020. All the male patients between 18 to 55 years and female patients between 18 to 45 years were included in study. Consecutive sampling technique was used to collect the sample. The exclusion criteria were: patient with erythrodermic and pustular psoriasis; patients with BMI>30Kg/m² ;patients suffering from diabetes, hypertension, renal, liver and thyroid disease; patients with family history of hyperlipidemia and metabolic syndrome; patients on lipid lowering drug; patients on drug that affect lipid metabolism like beta-blocker, thiazide diuretics, cyclosporine, retinoids, corticosteroid, hormonal contraceptive; patients with long history of smoking and alcohol intake. All patients were diagnosed clinically and severity of psoriasis was assessed with PASI score (7). Age, sex and BMI matched healthy controls were taken from Department of General practice coming for general health checkup cases. A written informed consent was taken after explaining

all the relevant details and its importance. Demographic and other relevant data was recorded from clinical interview and from lab report at predesigned proforma.

Lipid profile was evaluated after 14 hours of overnight fasting. The venous blood sample was taken. TC was estimated by enzymatic colorimetric method (Chod-pap). TG was estimated by GPO-Pap method. HDL- Cholesterol was estimated by enzymatic precipitation end point method. LDL-Cholesterol was estimated manually by formula: (TC- HDL-TG)/ 2.2. The Normal value for TC, TG, HDL- Cholesterol, LDL-Cholesterol are 200 mg/dl, 150mg/dl, 40 to 60mg/dl, 130mg/dl respectively. Study participants were described by baseline characteristics. Data was entered in Microsoft Excel 2013 and was further analyzed in SPSS version 20. Characteristics of cases and controls were compared using the Chi-square test and Student t-test (depending on the nature of the variable and the sample size). Pearson's correlation test was used were used to see the association between the outcome and independent variables. A P-value of <0.05 was considered to be statistically significant.

RESULT

A total of 71 cases were enrolled with equal number of matched healthy controls. Different characteristics of case and control are given in **Table 1**. Out of 71 cases 62 (87.3%) had plaque type of psoriasis, 8 (11.3%) had palmoplantar psoriasis and 1 (1.4%) had guttate psoriasis.

Table 1: Clinical and Demographic characteristics

Characteristics	Case (n=71)	Control (n=71)	p-value
Age	34.70±11.70	34.79±9.15	0.96
BMI	25.59±23	25.52±2.1	0.64
No of Male	33(46.5%)	33(46.5%)	
No. of female	38 (53.5)	38(53.5%)	
PASI	13.19±2.34		
Duration of disease	5.27±5.03		

Comparison of lipid profile of case and control is shown in **(Table 2)**. The TC and LDL-Cholesterol were higher in case as compared to control and the difference was statistically significant.

There was significant correlation between duration of disease and TC ($r=0.259$, $p=0.030$) and LDL-Cholesterol ($r=0.316$, $p=0.0007$). No significant correlation was found between disease severity and

HDL-Cholesterol ($r=0.118$, $p=0.325$) and TG ($r=-0.019$, $p=0.878$). There was significant correlation between severity of disease measured by PASI and TC ($r=0.274$, $p=0.021$) and LDL-Cholesterol ($r=0.248$, $p=0.037$). No significant correlation between PASI and HDL-Cholesterol ($r=0.185$, $p=0.122$) and TG ($r=0.133$, $p=0.268$).

Table 2: Lipid profile of case and control

Parameters (mg/dl)	Case (n=71)	Control (n=71)	p-value
Total Cholesterol (TC)	165.65± 36.18	147.90±32.84	<0.001
LDL- Cholesterol	99.93± 23.26	81.72± 51	<0.0001
HDL- Cholesterol	39.11± 8.91	37.34± 10.42	0.283
TG	139.32± 71.10	131.66± 59.61	0.413

DISCUSSION

Block *et al.* were the first to report increased serum lipids in patients with psoriasis about 50 years ago. Since then, many studies have been done on serum lipid levels in patients with psoriasis but with contradictory results (8).

This study showed TC and LDL- Cholesterol is significantly higher in patients with psoriasis as compared with control. There are reports where TC and LDL- Cholesterol is significantly increased in patients with psoriasis (5, 9-13). Some reports showing no differences are also noted (14-17). Study done in Nepal showed significant differences in TC level (18). Currently considerable clinical and experimental evidence supports a role for T-cell in the pathogenesis of psoriasis and atherosclerosis. The clinical manifestation of both diseases includes inflammation that seem to be driven by certain T-cell cytokines, characteristics for the T-helper 1 cell responses (19, 20). Lipid abnormalities seen in psoriatic patients, while promoting atherosclerosis might in parallel facilitate and maintain the inflammatory reaction in the skin (21). So, lipid abnormality may be associated with psoriasis.

This study showed severity and duration of disease is associated with lipid abnormality. A study done by Pereira *et al.* (22), Hadas *et al.* (23) and Pietrazak *et al.* (15) showed abnormal lipid level

associated with the severity of disease. Though some studies do not support this finding (5, 24). Regarding disease duration and atherogenic tendency, significant correlation was found by Farshchian *et al.* (25), which was similar to this study but significant correlation was not observed in other studies (15, 26). This indicates more severe and chronic the disease there is more risk of cardio vascular morbidity. More attention should be given not only to the proper management of psoriasis but also address the higher risk of cardiovascular morbidity.

LIMITATION

This study was a single center study and has only studied lipid profile. Other atherogenic profile like lipoprotein, insulin sensitivity etc. were not studied.

CONCLUSION

Lipid abnormalities in terms of increased TC and LDL-Cholesterol were found to be present in patients with psoriasis. Disease duration and severity was also associated with abnormality in lipid level. So, patients with psoriasis should be advised to undergo early screening to prevent them from adverse events of cardiovascular morbidity and mortality.

CONFLICT OF INTEREST

There is no conflict of interest in this present research paper. This research work is not a part of any other studies and it is our original work.

ABBREVIATIONS

TC- Total Cholesterol, Low-density Lipoprotein Cholesterol- LDL Cholesterol, High-density Lipoprotein Cholesterol-HDL Cholesterol, TG- Triglyceride

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