

Frequency of dyslipidemia in patients with psoriasis

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Abstract *Objective* To determine the frequency of dyslipidaemia in psoriatic patients.

Methods A cross-sectional study was carried out in the Department of Dermatology, Jinnah hospital, Lahore for the duration of six months. A total of 120 patients suffering from psoriasis, of any severity, belonging to either sex and with age between 15-70 years were included in the study. All patients in the study were investigated for total cholesterol, triglycerides, low-density lipoproteins and high-density lipoproteins after 12-14 hours of overnight fasting.

Results The mean age of the patients was 38.59 ± 13.86 years. There were 78 (65%) male and 42 (35%) female patients. The mean duration of psoriasis was 5.46 ± 4.49 years. The mean PASI score was 14.98 ± 8.95 . There were 67 (55.8%) patients having dyslipidaemia and 53 (44.2%) patients had normal lipid levels. 34 (28.3%) patients had raised total cholesterol ($>200\text{mg/dl}$), 32 (26.7%) raised low-density lipoprotein-cholesterol ($>130\text{ mg/dl}$), 44 (36.7%) hypertriglyceridemia ($>150\text{mg/dl}$) and 35 (29.2%) patients had reduced high-density lipoprotein-cholesterol levels ($<40\text{mg/dl}$).

Conclusion It is concluded from this study that patients of psoriasis have a high incidence of dyslipidaemia, as it was found in 55.8% of psoriatic patients.

Key words

Psoriasis, dyslipidemia.

Introduction

Psoriasis is a chronic, disfiguring, inflammatory and proliferative condition of the skin. The characteristic lesions of psoriasis consist of red, scaly, sharply demarcated, indurated plaques, most commonly involving scalp, elbows, knees, hands, feet, trunk, and nails. It affects 1-3% of world's population.¹ According to world psoriasis day consortium about 125 million

people all over the world suffer from this disease.² Age of onset of type I psoriasis is between 15-30 years and it is HLA associated while type II psoriasis appears after 40 years and lacks HLA association.³

Psoriasis has been associated with an abnormal plasma lipid metabolism and serum lipid levels are raised in patients with psoriasis.^{4,5,6} Total cholesterol (TC), total triglycerides (TG) and low-density lipoprotein cholesterol (LDL-C) have been found to be elevated in psoriatic patients. High-density lipoprotein cholesterol (HDL-C) is either unaffected or reduced.

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Since dyslipidaemia is one of the criteria for diagnosing metabolic syndrome, psoriasis is also found to be associated with metabolic syndrome.^{7,8} Insulin resistance can lead to type 2 diabetes mellitus in psoriatic patients.⁹

Other co-morbid factors increasing the risk of dyslipidaemia in psoriatic patients, include higher body mass index (BMI) >30kg/m², family history of dyslipidaemia, sedentary life style, high fat diet, and patients taking retinoids or cyclosporine for the disease.

The chronic inflammatory nature of psoriasis and dyslipidemia have been suggested to be contributing risk factors for the development of co-morbidities like atherosclerosis, coronary artery disease and myocardial infarction resulting in increased cardiovascular mortality.^{10,11,12}

There are multiple reasons for dyslipidemia associated with psoriasis. The structural and functional changes in digestive system, immune mechanism involving IL-6, tumor necrosis factor and C-reactive protein¹³ and cellular oxidative stress may be responsible for altered lipid metabolism. Autoantibodies against oxidized LDL have been found in psoriatic patients.⁵ Dyslipidaemia not only promotes atherosclerosis but also maintains the inflammatory reaction in the skin.¹⁴ The level of antibodies against oxidized LDL correlates with disease severity.

The association of dyslipidaemia with psoriasis has been established in various international studies,^{5,6,7} but to date only one local study has been done to establish an association between psoriasis and dyslipidaemia.⁴ The present study was planned to determine the frequency of dyslipidaemia in psoriatic patients in our setup.

Dyslipidemia in psoriatic patients is often overlooked and untreated. Since dyslipidemia is the independent risk factor for cardiovascular events, dermatologists should consider it in order to enhance early assessment of cardiovascular risk and mortality.

Methods

This cross-sectional study was conducted at outpatient and inpatient departments of Dermatology Unit-1, Jinnah Hospital, Lahore for the duration of six months from June 2010 to December 2010. The disease was diagnosed clinically and PASI (psoriasis area and severity index) score was calculated. A total of 120 patients suffering from psoriasis, of any severity, belonging to either sex and with age between 15-70 years were enrolled after the informed consent. The pregnant patients and the patients with diabetes mellitus, chronic renal failure, chronic liver disease, hypothyroidism, obesity or taking drugs like beta blockers, thiazide diuretics, corticosteroids, cyclosporine, retinoids and lipid lowering drugs were excluded from the study. Detailed demographic data were collected from enrolled patients. After an overnight fast (12-14 hours) the patients were asked to return early in the morning and their intravenous blood sample about 3cc was sent to Pathology Laboratory, Jinnah hospital for estimation of TC, TG, LDL-C and HDL-C. The report was assessed for the presence or absence of dyslipidaemia.

Data were entered and analyzed in SPSS version 13.0. Numerical variable like age was presented as mean and standard deviation. Gender and presence or absence of dyslipidaemia was presented as frequency and percentage. Age (15-30 years, 31-45 years, 46-60 years and above 60 years), gender (male, female) and psoriasis area and severity index i.e. PASI score (mild <7,

moderate 7-12 and severe >12) acted as effect modifiers and were addressed through stratification.

Results

In the study 120 patients were enrolled from inpatient and outpatient departments according to the inclusion criteria. The mean age of the patients was 38.59 ± 13.86 (range 15-70 years). Out of the total 120 patients, 78 (65%) were male patients and 42 (35%) were female. The mean duration of psoriasis was 5.46 ± 4.49 years. The mean PASI score was 14.98 ± 8.95 . Out of 120 patients, 30 (25%) had mild psoriasis i.e. PASI <7, 30(25%) patients had moderate psoriasis i.e. PASI 7-12 and 60(50%) patients had severe psoriasis i.e. PASI >12.

Out of the total 120 patients, 67 (55.8%) patients had dyslipidaemia and 53 (44.2%) patients were normolipidemic (**Table 1**).

Dyslipidaemia was found in 40 (51.3%) males and 27 (64.3%) females. Normolipidemia was found in 38 (48.7%) male and 15 (35.7%) female patients. The highest incidence of dyslipidaemia was seen in the age group of 31-45 years as shown in **Table 2**.

There were 34 (28.3%) patients having >200 mg/dl total cholesterol and 86 (71.7%) patients having <200 mg/dl total cholesterol. Thirty two (26.7%) patients had >130 mg/dl LDL-C and 88 (73.3%) patients had <130 mg/dl LDL-C. Forty four (36.7%) patients had >150 mg/dl triglycerides and 76 (63.3%) patients had <150 mg/dl triglycerides. There were 35 (29.2%) patients having <40 mg/dl HDL-C and 85 (70.8%) patients having >40 mg/dl HDL-C. Frequency of abnormal lipid levels in psoriatic patients is shown in **Table 3**.

Table 1 Age distribution and frequency of dyslipidemia (n=120).

<i>Age distribution</i>	
15-30 years	46 (38.3)
31-45 years	40 (33.3)
46-60 years	27 (22.5)
>60 years	& (5.8)
<i>Frequency of dyslipidemia</i>	
Dyslipidemia	67 (55.8)
Normolipidemia	53 (44.2)

Table 2 Frequency of dyslipidaemia according to age groups of patients (n=120).

<i>Age group (years)</i>	<i>Dyslipidemia</i>	<i>Normolipidemia</i>
15-30, n=46	21 (45.6%)	25 (54.4%)
31-45, n=40	26 (65%)	14 (35%)
46-60, n=27	17 (62.96%)	10 (37%)
> 60, n=7	3 (42.9%)	4 (57.1%)

Table 3 Frequency of abnormal lipid levels in psoriatic patients (n=120).

<i>Lipid level abnormality (mg/dl)</i>	<i>N (%)</i>
Total cholesterol >200 mg/dl	34 (28.3)
Low-density lipoprotein >130 mg/dl	32 (26.7)
Triglycerides >150 mg/dl	44 (36.7)
High-density lipoprotein <40 mg/dl	35 (29.2)

When we analyzed the result according to disease severity it was seen that in the patients with mild psoriasis i.e. PASI <7, 7 (23.3%) patients had dyslipidaemia. In the patients with moderate psoriasis i.e. PASI 7-12, 10 (33.3%) had dyslipidaemia. In the patients with severe psoriasis i.e. PASI >12, 50 (83.3%) had dyslipidaemia. Hence incidence of dyslipidaemia was directly proportional to the severity of disease.

Discussion

Psoriasis is a chronic, disfiguring, inflammatory and proliferative condition of the skin. Psoriasis has been associated with an abnormal plasma lipid metabolism and serum lipid levels are raised in patients with psoriasis.^{4,5,6}

In our study the mean age of the patients was 38.59 ± 13.86 years while in the study of Bajaj *et al.*⁴ the mean age of patients was 37 ± 7.96 years and in the study of Akhyani *et al.*⁵ the mean age was 41.18 ± 17.37 years.

The mean duration of psoriasis was 5.46 ± 4.49 years as compared with the study of Bajaj *et al.*⁴ the mean duration was 4.5 ± 1.89 years.

The association between psoriasis and dyslipidemia is somewhat controversial. We found a strong association as 55.8% of the psoriatic patients had altered lipid levels, compared to the study of Cohen *et al.*⁷ dyslipidemia was present in 50.9% patients. While in the study of Dreier *et al.*⁶ dyslipidemia was found in 57.1% psoriatic patients. But in contrast, studies done by Neimann *et al.*¹⁵ and Farshchian *et al.*¹⁶ failed to find a consistent association.

Among many case-control studies on serum lipid levels in psoriasis, conflicting results have been reported regarding serum cholesterol, LDL-C, serum triglyceride and HDL-C levels. Total cholesterol and LDL-C levels in psoriatic patients were found to be either significantly higher^{4,5,17,18} or similar^{6,16,19} to controls. Triglyceride levels were reported to be significantly higher^{4,5,6,17} in psoriatic patients in some studies, but not in other studies.^{16,18,19} Finally, HDL-C levels had been found to be significantly lower,^{6,20} similar^{4,5,17,18} or even higher¹⁹ to controls. We found hypercholesterolemia in 28.3%, raised LDL-C in 26.7%, hypertriglyceridemia in 36.7% and low HDL-C in 29.2% of psoriatic patients.

Although female patients presented to us were less in number (35%) as compared to male patients (65%) but the females were found to be more dyslipidemic (64.3%) than males (51.3%).

This finding is contrary to the study of Bajaj *et al.*⁴ who found dyslipidemia in males more than the females.

Dyslipidemia was found more frequently in the patients with severe psoriasis. It was observed that in the patients with mild psoriasis i.e. PASI<7, 7 (23.3%) had dyslipidemia as compared to the patients with severe psoriasis i.e. PASI>12, 50 (83.3%) had dyslipidemia. Thus, frequency of dyslipidemia increased proportionately with the severity of disease. Javidi *et al.*¹⁷ found that total cholesterol levels significantly increased with disease severity. LDL-C levels also increased but not significantly, while serum triglyceride and HDL had no relation with disease severity. Contrary to this, Mallbris *et al.*¹⁹ did not observe any significant association between disease severity and lipid profile.

According to a survey done at Agha Khan Hospital 31% of normal ambulatory Pakistanis had dyslipidemia²¹ while our study showed 55.8% psoriatic patients had dyslipidemia. This shows that psoriatic patients have a much higher incidence of dyslipidemia as compared to normal Pakistani population.

Conclusion

It is concluded from this study that patients with psoriasis had a high risk of dyslipidemia as it was found in 55.8% of patients. Also the more severe the psoriasis, the higher is the risk of dyslipidemia. Therefore, it is important that serum lipid levels should be routinely measured in all the psoriatic patients so as to identify dyslipidemia early and to avoid the complications.

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