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ORIGINAL ARTICLE

Frequency of Dyslipidemia in patients with Psoriasis and Association with Disease Severity

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ABSTRACT

Background: Psoriasis is a recurrent disfiguring skin disease, associated with abnormal lipid metabolism and with high occurrence of cardiovascular complications. This linked to the extent of disease, as it is often seen in those patients who have larger body areas involved with psoriasis.

Objective: To estimate frequency of dyslipidemia in psoriatic patients and to determine the frequency of dyslipidemia in psoriatic patients based on the severity of disease.

Study Design: Cross-sectional study

Place and Duration of Study: Department of Dermatology, Fauji Foundation Hospital Rawalpindi from 1st March 2017 to 30th September 2017.

Methodology: One hundred and fifty cases were enrolled. All cases were enrolled and 3ml of blood was collected following 12 hrs of fasting for determination of lipid profile. Blood sample was sent to the Hospital laboratory and reports were verified by senior pathologists. Severity of psoriasis was determined according to PASI score.

Results: Age of participants was between 18-60 years with mean 38.88±12.26 years and 29 (19.33%) male and 121 (80.67%) female cases. According to severity of disease, 50 (33.3%) cases had mild, 70 (46.7%) had moderate and 30(20%) cases had severe Psoriasis. The mean cholesterol, triglycerides (TG), low density lipoprotein (LDL) and high density lipoprotein (HDL) was 12.91 ± 2.17, 8.93 ± 2.90, 5.0 ± 2.28 and 1.98 ± 0.31 respectively. There were 100(66.7%) cases who had dyslipidemia and 50(33.3%) had normal lipid profile.

Conclusion: Frequency of dyslipidemia is very high and is associated with severity of psoriasis.

Keywords: Psoriasis, Dyslipidemia, Lipid profile and Cardiovascular disease.

INTRODUCTION

Psoriasis is a non-contagious, disfiguring ailment of the skin which has protracted course. It affects about 1-3% of the world's population.[1] The disease ranges in severity from a few scattered red, scaly plaques to involvement of almost the whole body. The aetiology for occurrence of this disorder is still unknown. However, climate, genetic susceptibility, environmental antigen exposure and metabolic as well as immunological mechanisms are held responsible.[2] Imbalance in Th1 and Th2 pathway leads to pathogenesis of psoriasis. Defected cellular immunity and its related mediators like tumour necrosis factor-α (TNF-α), pro-inflammatory transcription factor (transcription and AP-1 and NF-κB, signal transduction) and inflammatory cytokines (IL-1, IL-6) and) also has a role.[3,4]

Psoriasis primarily involves skin and different morphological types have been identified but in few cases joint involvement is seen.[5] 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. Deviation in lipid metabolism is identified in patients of psoriasis and serum lipid levels are deranged in patients with psoriasis.[6]

Diabetes, dyslipidemia, hypertension and obesity seem to be increased in psoriasis patients as compared with general population.[4] Metabolic syndrome is one of the most common findings in these cases. Other factors linked with dyslipidemia in psoriasis patients include BMI > 30 kg/m^2, family history, of dyslipidemia, fat rich diet, sedentary life style and patients on retinoid or cyclosporine.[1]

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.[7] There are multiple reasons for dyslipidemia associated with psoriasis. The structural and functional changes in digestive system, immune mechanism comprising cellular oxidative stress, C-reactive protein, IL-6 and tumour necrosis factor possibly contributing for defective lipid metabolism. Autoantibodies against oxidized LDL have been found in psoriatic patients. Dyslipidemia not only promotes atherosclerosis but also maintains the inflammatory reaction in the skin.[8] The level of antibodies against oxidized LDL correlates with disease severity.

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. Since dyslipidemia is one of the criteria for diagnosing metabolic syndrome, psoriasis is also found to be associated with metabolic syndrome. Insulin resistance can lead to type 2 diabetes mellitus in psoriatic patients.[9]

The association of dyslipidemia with psoriasis has been established in various international studies, but to date only one local study has been done to establish an association between psoriasis and dyslipidemia. 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.[10]

Various international studies have shown lipid profile abnormalities in patients with psoriasis.[11,12] A study reported that dyslipidemia was seen in 29% of psoriaticpatients.[13] Few studies have been conducted in Pakistan but they have their limitations. A local study reported frequency of dyslipidemia to be 55.8% in patients with psoriasis. Further they added that total cholesterol >200 mg/dl was seen in 34(28.3%), Low-density lipoprotein >130 mg/dl 32 was present in (26.7%), 44 (36.7) cases had Triglycerides >150 mg/dl and High-density lipoprotein < 40 mg/dl was present in 35(29.2%).[1]

Due to sparse relevant studies in Pakistan we aim to conduct this study. Moreover, there is huge difference in frequency of dyslipidemia in international and national literature i.e. 29.9%[7] to 55.8%.[1] If we find high frequency of dyslipidemia, then early screening for atherosclerosis can be done and complications can

be reduced. It can also help in choosing the appropriate treatment for patients of psoriasis with dyslipidemia and improve the outcome of the disease and its associations.

MATERIALS AND METHODS

This descriptive cross sectional study was conducted at Department of Dermatology, Fauji Foundation Hospital Rawalpindi from 1st March 2017 to 30th September 2017. After permission from Ethical Review board, 150 patients both male and female having age 12-60 years with psoriasis of at least 6 months' duration were enrolled through non-probability, consecutive sampling technique. Patients with history of or diagnosed case of coronary artery disease (CAD) or cerebrovascular accident (CVA), hypothyroidism, chronic liver disease, chronic systemic or metabolic disorder like diabetes or chronic kidney disease and patients already on lipid-lowering drugs or who have received cyclosporine or/and systemic retinoid therapy during the preceding one month were not included.

Written consent was taken from every patient. History in detail was taken and examination was done. All cases were enrolled and 3ml of blood was collected after 12hrs of fasting for determination of lipid profile. Dyslipidemia was labelled as; Cholesterol (>5.2mmol/l), Triglyceride (>1.71mmol/l), low-density lipoprotein (LDL) (>3.4mmol/l), high-density lipoprotein (HDL) cholesterol (<0.9mmol/l).

Severity of psoriasis was determined according to PASI score as: Mild = PASI <7, Moderate = PASI 7-12, Severe = PASI > 12. All data was collected by dermatologist on a predesigned proforma.

Data was entered and analysed through SPSS version 26. Data was stratified for age, gender, severity of psoriasis and duration of disease to address the affect modifiers. Post stratified Chi-square test was applied. P≤0.05 was considered as significant.

RESULTS

The mean was 38.88±12.26 years with age range of 18-60 years. There were 61 (40.7%) cases who were 18-35 years old and 89(59.3%) were 36-60 years' age group. 121 (80.67%) female and 29 (19.33%) male participated. The mean duration of disease was 19.12±7.18 months. One hundred and two (68%) cases had disease since 7-24 months and 48 (32%) cases had psoriasis of > 24 months' duration (Table 1).

Table1: Characteristics of patients with Psoriasis (n=150)

Variable	Mean±SD
Age (years)	38.88±12.26
Duration (months)	19.12±7.18
Dyslipidemia	
Cholesterol	12.91±2.17
Triglyceride	8.93±2.90
LDL	5.00±2.28
HDL	1.98±0.31

Table 2: Post stratification for age, gender, duration and severity of Psoriasis

Variable	Dyslipidemia		χ^2	P value
	Yes	No		
Age (years)				
18-35	41(41%)	20(40%)	0.014	0.906
36-50	59(59%)	30(60%)		
Gender				
Male	15(15%)	14(28%)	3.61	0.057
Female	85(85%)	36(72%)		
Duration (months)				
7-24	71(71.0%)	31(62.0%)	1.241	0.265
>24	29(29.0%)	19(38.0%)		
Severity of Psoriasis				
Mild	32(32%)	34(68%)	17.90	<0.001
Moderate	40(40%)	11(22%)		
Severe	28(28%)	5(10%)		

According to severity of disease, 50 (33.3%) cases had mild, 70 (46.7%) had moderate and 30 (20%) cases had severe psoriasis (Fig. 1). The mean cholesterol, triglycerides, LDL and HDL was 12.91±2.17, 8.93±2.90), 5.0±2.28 and 1.98±0.31 respectively. There were 100 (66.7%) cases who had dyslipidemia and 50 (33.3%) had normal lipid profile (Fig. 2). When data was stratified for age, gender, duration and severity of disease we found that frequency of dyslipidemia was statistically same in each stratum {p>0.05} [Table-02]

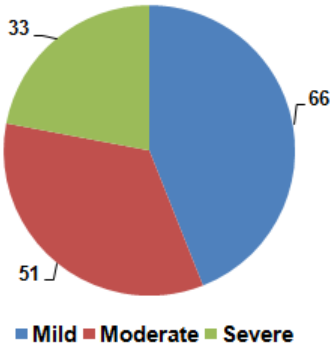

Fig. 1: Distribution of severity of psoriasis

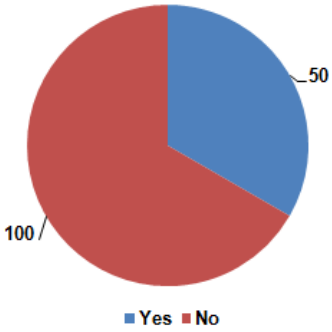

Fig. 2: Distribution of dyslipidemia

DISCUSSION

In my study, mean age of participants was 38.88±12.26 years with 29 (19.33%) male and 121 (80.67%) female cases. Dyslipidemia was found in 66.67% of the patients which is in concurrence with a study conducted at the Department of Dermatology, Jinnah hospital, Lahore.[14] In that study dyslipidemia was found in 55.8% of psoriatic patients with mean age of 38.59±13.86 years and 78 (65%) males and 42 (35%) female patients. Mean age was similar to current study but female preponderance was noted in our study which is due to the fact that Fauji Foundation Hospital is a trust hospital for veterans and their families. The female children are entitled till their marriage whereas males have entitlement till 18 years of age which accounts for the high female turnover in our study.

Similarly, another study was performed that included 70 patients affected by psoriasis. Both genders, above 18 years of age were taken with average age of the respondents being 47.14±15.41, which comprised of 36 (51.43%) males and 34 (48.57%) females. Duration of psoriasis on average was 15.52±12.54) years. The main findings of the study have suggested that frequency of dyslipidemia in those affected by psoriasis was 62.85%. Increase in values of PASI score and dyslipidemia were statistically related (p=0.0001; r=0.41). Therefore, dyslipidemia is linked with Psoriasis.[15] In current study there were 100(66.7%) cases that had dyslipidemia and 50(33.3%) that were also associated with severity of psoriasis.

Moreover, in 2014, a case control study was conducted to find any association between dyslipidemia and psoriasis in India (MGM Medical College of Bihar). 40 psoriatic patients were taken as cases to 40 patients of dyslipidemia without psoriasis were

nominated as controls. Majority of psoriasis patients were males, out of which 35.00% in fourth decade and only 2.50% in seventh decade. Statistically significant difference was noted in psoriatic patients with LDL-cholesterol was increased in 40.00% paralleled to 15.00% in control groups (X^2=6.27, p=0.012), raised cholesterol level in 20% (>200 mg/dl) paralleled to 2.50% in the control groups (X^2=17.455, p=0.00016), raised Triglycerides level 40% (>150 mg/dl) equated to 12.50% in control groups (X^2=9.028, p=0.0026). Considerably decreased HDL cholesterol level was seen in 32.50% of psoriasis cases paralleled to 12.50% in control groups. (X^2=7.22, P=0.027). So, the study has pointed higher LDL-cholesterol, triglyceride and total cholesterol levels and low HDL-Cholesterol level.[16] In current study total cholesterol, LDL and triglyceride levels were found to be raised but HDL level is not reduced.

However, Ma et al. performed in 2014, a population-based, cross-sectional study to examine the association between psoriasis and multiple measurements of dyslipidemia, which include levels of triglycerides, Apo-lipoprotein B, LDL-cholesterol, total cholesterol, HDL- cholesterol and HDL/LDL ratio. The result of the study has shown that the sample comprised of 13,418 participants having psoriasis. 2.63% (353 of total) participants were diagnosed by health care providers. From this population, the multivariate analysis revealed that certain levels of dyslipidemia and psoriasis were not considerably associated with each other. Explicitly, in patients of psoriasis, odd ratios (OR=0.67, 95% CI 0.43–1.03) of LDL-cholesterol (OR=0.96, 95% CI 0.74–1.24), of total cholesterol, (OR=1.20, 95% CI 0.89–1.63) of triglycerides, (OR=0.92, 95% CI 0.65-1.30) of HDL-cholesterol, , (OR= 1.29, 95% CI 0.69-2.41) of apolipoprotein B, (OR=1.20, 95% CI 0.8-1.79) of HDL/LDL revealed no connection between them. It was concluded from the study conducted by Ma et al[17] that there is no association between deranged lipid levels and psoriasis. In future, to identify considerable differences in the lipid levels among participants with and without psoriasis larger sample sizes is required.

CONCLUSION

The frequency of dyslipidemia is very high and is associated with severity of psoriasis.

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