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EVALUATION AND ANALYSIS OF LIPID PROFILE IN PSORIASIS PATIENTS

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ABSTRACT Psoriasis is a chronic inflammatory skin disease that is associated with an increased cardiovascular risk profile. The underlying pathogenic mechanisms remain unclear. Multiple factors including systemic inflammation, oxidative stress, aberrant lipid profile and concomitant cardiovascular risk factors have been associated. Psoriasis has been associated with abnormal plasma lipid metabolism and oxidative stress. In this study, we emphasized on the serum lipid disturbances in psoriasis at various clinical stages.

The study was conducted at KLE Hospital and MRC, Belgaum in 40 subjects of psoriasis with age group of 20-70 years and 40 controls. Cases with history of diabetes, hypertension, obesity, family history of hyperlipidemia, intake of systemic drugs like lipid lowering agents, alcohol and smoking were excluded from the study.

Blood and urine samples were collected after obtaining proper consent from all cases and controls. Serum lipids were measured by enzymatic methods. Serum TC, LDL-C, TC/HDL-C ratio and LDL-C/HDL-C ratio were significantly higher in psoriasis patients compared to controls but no statistically significant difference in serum TG, HDL-C and VLDL-C. We conclude that pathogenic link may coexist between lipoprotein, oxidative stress and psoriatic pathophysiology. This provides valuable information for timely intervention.

KEYWORDS : Psoriasis, lipid profile, cardiovascular risk

INTRODUCTION

Psoriasis is a common, chronic, inflammatory, papulosquamous, proliferative condition of the skin, in which both genetic and environmental influences have a critical role. The disease is enormously variable in duration, periodicity of flares and extent.[1] Psoriasis is a multisystem disease affecting more than 2% of the population.[2]

Its etiology is still unknown, while genetic, metabolic and immunological mechanisms have been recommended as its cause. Lipid metabolism maybe playing a role in the pathogenesis of psoriasis.[3] Various studies point out to lipid metabolism abnormalit ies during the course of psoriasis, suggesting that the perturbation of lipid metabolism may be a generalized phenomenon in 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.[2]

In the recent years, psoriasis has been recognized as a systemic disease associated with numerous multiorgan abnormalities and complications. In psoriatic patients an increased risk of cardiova scular abnormalities, hypertension, dyslipidemia, atherosc lerosis, diabetes mellitus type 2, obesity, chronic obstruc tive pulmonary disease, cerebral stroke, osteoporosis, cancer and depression was noticed.[4]

Patients with psoriasis have been observed to show changes in plasma lipid and lipoprotein composition, with tendency for an increase in total cholesterol (TC) and triglycerides (TG) associated with very low density lipoprotein (VLDL) cholesterol, and a decrease in high density lipoprotein (HDL) cholesterol.[5,6]

METHODOLOGY

The study was carried out on 40 psoriatic patients and 40 controls of age group 20-70yrs who attended the inpatient and outpatients department of Dermatology at Dr. Prabhakar Kore KLE Hospital and MRC, Belgaum. Ethical clearance and patient conscent was obtained for the study. Diabetic, hypertensive, hyperlipidemic, chronic alcoholics, patient taking lipid lowering drugs and retinoids are excluded from the study. After 12 hours overnight fasting , venous blood samples were collected from cases and controls and the samples were centrifuged for the estimation of fasting blood glucose (Hexokinase-glucose-6-phosphate dehydrogenase method) 7,8 and total cholesterol (Enzymatic method- cholesterol oxidase/Horseradish peroxidase) 9,10 serum triglycerides (using A25 biosystem auto analyzer)11, LDL cholesterol, HDL cholesterol (Abell-Kendall method)12 was done and VLDL cholesterol, LDL-cholesterol is calculated from the values of total cholesterol.

RESULTS TABLE 1: Distribution of serum lipid parameters in cases and controls

Lipid parameters	Cases	Controls	T value	P value
Total cholesterol (mg/dl)	158.8±41.20	134.8±28.36	3.028	0.003
Triglycerides (mg/dl)	124.8±82.16	119.5±74.00	0.300	0.765
LDL-C (mg/dl)	94.2±36.24	73.6±32.86	2.653	0.010
HDL-C (mg/dl)	40.2±11.34	40.5±10.78	0.131	0.896
VLDL-C (mg/dl)	24.4±13.95	20.5±23.31	0.909	0.366
T.CH/HDL-C (mg/dl)	4.21±1.46	3.5±0.91	2.695	0.009
LDL-C/HDL-C (mg/dl)	2.5±1.15	1.9±1.01	2.390	0.019

Results are presented as mean ±SD, + Suggestive significance $p<0.05$

TABLE 2: Distribution of cases and controls according to Serum cholesterol levels

Total Cholesterol	Cases (n=40)	Controls (n=40)
Upto 200 (Desirable)	34 (85%)	37 (92.5 %)
200-239 (Borderline)	3 (7.5%)	2 (5%)
>240 (High)	3 (7.5%)	1(2.5%)
Inference	Percentage of patients with total cholesterol >200 is not very significant in cases as compared to controls (14% vs. 7.5 %) with p= 0.479	

TABLE 3: Distribution of cases and controls according to Serum triglyceride levels

Triglycerides	Cases (n=40)	Controls (n=40)
Upto 150 (normal)	33 (90%)	32 (80%)
150 - 199 (borderline)	3 (7.5%)	3 (7.5%)
>200 (High)	4 (10%)	5(12.5%)
Inference	Percentage of patients with triglycerides >150 is not significant in cases when compared to controls (8.5% vs. 30%) with p= 0.877	

TABLE 4: Distribution of cases and controls according to Serum HDL- C levels

HDL-C	Cases (n=40)	Controls (n=40)
Upto 35	19 (45%)	16 (40 %)
35-60	19 (47.5%)	22 (55%)
>60	2 (5%)	2 (5%)
Inference	Percentage of patients with HDL-C <35 is not significant in cases when compared to controls (45% vs. 40%) with p= 0.651	

TABLE 5: Distribution of cases and controls according to serum LDL-C levels

LDL-C	Cases (n=40)	Controls (n=40)
<150	38 (95%)	38 (95%)
>150	2 (5%)	2 (5%)
Inference	Percentage of patients with LDL -C >150 is equal	
	when compared to controls (5% vs. 5%) with p= 1	

TABLE 6: Distribution of cases and controls according to serum VLDL-C levels

VLDL-C	Cases (n=40)	Contro	ls (n=40)
5 – 40	37	(92.5%)	37 (92.5%)
>40	3	(7.5%)	4 (10%)
Inference	Percentage of patients with VLDL-C lev els >40 is not		
	significant in cases when compared to co ntrols (7.5% vs		
	10%) with p= 1		

TABLE 7: Distribution of cases and controls according to TC/ HDL-C ratio

TC/HDL-C	Cases (n=40)	Contr	ols (n=40)
<4.99	28 (70%)	36	(90%)
>4.99	12 (30%)	4 (10%)	
Inference	Percentage of patients with TC/HDL-C	ratio >4.99 is	
	significantly more in cases when comp ared to controls (30% vs. 10%) with p= 0.0 25		

TABLE 8: Distribution of cases and controls according to serum LDL-C/HDL-C levels

LDL/HDL ratio (mg/dl)	Cases (n=40)	Contrrols (n=40)
<3.50	30 (75%)	38 (95%)
>3.50	10 (25%)	2 (5%)
Inference	Percentage of patients with LDL-C/HDL-C ratio >3.50 is significant in cases when compared to controls (25% vs. 5%) with p = 0.012	

DISSCUSION

The present study is a hospital-based study conducted over a period of 12 months in the OPD of Dermatology, Venereology and Leprosy in KLES Dr. Prabhaker Kore Hospital and MRC, Belgaum. Total 25800 skin patients were treated during this period, of which 40 were psoriasis cases. So the frequency of psoriasis among OPD cases was 0.15. Psoriasis is a chronic inflammatory skin disease that is associated with an increased cardiovascular risk profile. The systemic inflammation present in psoriasis, various systemic treatments for psoriasis and an increased prevalence of unhealthy life style factors contribute to this unfavorable risk profile. The purpose of this study is to determine serum lipid disturbances in lipid profile in psoriasis. Although there have been extensive studies of serum lipids and apolipoprotein levels in psoriasis, their importance in the etiology or in the enhancement of the disease remains controversial.[11,14-16] Genetic studies demonstrate that psoriasis and cardiovascular disease share common pathogenic features, for example inflammatory cytokines like TNF-α and IL-1 play an important role. The chronic inflammation in psoriasis has an unfavourable effect on the cardiovascular risk profile. Multiple cardiovascular risk factors seem to be influenced like blood pressure, oxidative stress, dyslipidemia, endothelial cell dysfunction and blood platelet adhesion.[17-18] Systemic treatments in psoriasis reduce the cardiovascular risk by diminishing the inflammation, but most of these therapies also have adverse cardiovascular effects such as dyslipidemia, hyperhomocysteinemia and hypertension. As a consequence, preventive measures are indicated during long-term treatments. Prospective research is warranted to accurately estimate the increased cardiovascular risk in psoriasis, to determine the underlying processes and consider preventive measures according to the absolute risk of cardiovascular disease.[17] Lipid metabolism disorders may play a role in psoriasis pathogenesis.[19] Increase in cardiovascular diseases, myocardial infarction, cardiovascular hypertension and diabetes is proved in several studies[20] justifies high mortality and morbidity in patients with prolonged and severe disease.[21] Mallbris et al., in a study of 200 cases of psoriasis proved that there was higher total cholesterol, VLDL-C, HDL-C, apo B and apoA1 levels compared to normal control group.[2] We found that present study was not consistent with these findings. Piskin in his study of 100 psoriasis patients showed serum total and LDL-C levels to be significantly higher than that of control group.[19] Our present study is consistent with the above findings. Seishma et al., observed normal levels for total cholesterol and HDL values in 38 psoriatic patients.[22] Our present study is not consistent with these findings. Rocha-Preira reported rise in TC, TG, LDL, VLDL and reduction in HDL, a rise in lipoperoxidase products and a reduction in total antioxidant capacity and in antioxidants A and E in psoriatic patients. They also found that the worsening of psoriasis was associated with the enhancement of oxidative stress and lipid risk changes.[13] Uyanik reported significant increase in serum triglycerides levels in 72 psoriatic patients corresponding to normal group in his study. TC, HDL, LDL in patients and control groups were similar.5 The findings of our study are not consistent with this study. In a study by Torkhovskaia on 192 psoriatic patients, high percenta ge of patients with hypo- or hypercholesterolemia, high and low plasma HDL cholesterol levels were observed, depending on disease severity. Psoriasis patients have big range not only in HDL2 cholesterol levels but also in HDL3 cholesterol. The data obtained suggest the existence of changes in reverse cholesterol transport system in psoriasis, which may influence skin cell proliferation.[16] Javedi Z et al in the study of 60 psoriatic patients found significantly higher TC, TG and LDL-C values in patients compared to controls.[3] Among the many studies in serum lipid values in psoriasis, conflicting results have been reported. In studies on serum TC levels in psoriatic patients, high,[23,13,19] low[24, 25] and normal,[26, 27, 22] values all have been reported. The findings of our study are consistent with this study. Dreiher et al in his study on 10,669 patients and 22,996

subjects without psoriasis observed that triglycerides levels were higher in psoriasis patients and HDL-C levels were lower. This study supported previous reports of an association between psoriasis and lipid abnormalities.[28] Several studies have reported high[24,13] low25 and normal [26,19] serum triglyceride levels in psoriasis patients. We found that triglyceride levels in psoriasis patients were not statistically significant compared to the control group (p=0.765). Thus, our study is not consistent with the above study. Tekin et al in his study of 84 patients and 40 healthy controls observed that TC, TG, LDL-C levels were significantly higher in psoriatic patients when compared to controls. Our study is consistent with the above findings.29 Bajaj et al in his study of 79 patients and equal number of controls showed that TC, TG and LDL-C levels were significantly higher in psoriatic patients when compared to controls.[30] The findings in our study are consistent with these findings. Akhyani et al in his study of 50 cases 50 and controls observed that TC, TG, VLDL-C and LDL-C levels were significantly higher than those of controls. HDL-C levels did not show any significant difference between the cases and controls.[31] The findings of our study are consistent with these findings. In several studies normal[19,22] and low[24,13,28] serum levels of HDL-C have been detected. In our study, HDL-C levels in psoriatic patients were greater than the control group (p=0.896), which is not statistically significant. As for serum LDL-C levels, high[13,19] or normal[24,26,13,19] values have also been reported in psoriasis. We found that serum LDL-C levels are higher in psoriasis patients than in control group (p=0.01). In studies on serum VLDL-C levels in psoriatic patients, normal19 and high[2,13] values have been reported. We found that serum VLDL-C values in psoriatic patients were statistically insignificant compared to control group (p=0.366). In our study, significantly raised TC/HDL ratio (p=0.009) and LDL/HDL ratio (p=0.019) were observed in psoriatic patients against controls.

CONCLUSION

Results obtained from various studies conducted upon patients with psoriasis point altered serum lipids and its association with cardiovascular complications. In this background, an assessment of serum lipids in relation to psoriatic patients has been made. The present study was carried out in 40 psoriasis patients and compared with age and gender matched controls. Serum lipid level was measured by enzymatic method. There was significant elevation in the TC, LDL-C, TC/HDL-C ratio and LDL-C/HDL-C ratio when compared to the control group. Serum TG, HDL-C, and VLDL-C levels were not significant when compared to the control group.

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