Section: Biochemistry

Original Research Article

STUDY OF LIPID PROFILE IN PSORIASIS

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Abstract

Background: Psoriasis is a chronic inflammatory skin disease affecting approximately 1–5% of population. Lipid abnormalities are considered to play major role in the pathogenesis of psoriasis and patients with psoriasis may have increased risk of arterial and venous obstructive diseases. Objective: To know whether serum lipid can be used as cardiovascular risk predictor in patients with psoriasis. **Materials and Methods:** The subjects were 90 individuals aged between 15 and 45 years. They were divided into three groups of 30 individuals each: psoriatic patients, patients with other skin diseases and control group. All of the study subjects underwent venous blood sampling (5 mL) and lipid profile was assessed in all subjects. **Result:** We found elevated level of total cholesterol, S.triglycerides, S.LDL & S.VLDL in psoriasis group as compare to other two groups where these levels were within normal range. S.HDL was comparatively low in patients with psoriasis but it was statistically not significant. **Conclusion:** As we found higher levels of total cholesterol, serum triglycerides, LDL and VLDL; we can say there is an increased chance of cardiovascular diseases in patients with psoriasis. HDL level was within normal range.

INTRODUCTION

Psoriasis is a common chronic recurrent inflammatory skin disorder that shows exacerbation and remission attacks. Its lesion is characterized by sharply demarcated red plaques with silver-whitish scales typically located on the scalp, knee or elbows.[1] Psoriasis can occur at any age, the first peak is seen between 15 – 20 years, with a second peak between 55 – 60 years. It is a common disease with prevalence ranging from < 1–5%.[2] The main pathological features of these skin lesions are keratinocyte hyper proliferation and loss of differentiation, inflammatory cell infiltration, and vascular changes. Chronic inflammation thought to be a characteristic feature of psoriasis may play a role in the initiation, pathogenesis and prognosis of dyslipidemia and atherosclerosis. Alterations in plasma lipid and lipoprotein metabolism including increase in total cholesterol (TC), triglyceride(TG), low density lipoprotein cholesterol (LDL-C) and decrease in high-density lipoprotein cholesterol (HDL-C) levels suggest that psoriasis may be associated with the disorders of lipid metabolism.[3,4] Inflammation initiates a variety of changes known as acute-phase response (APR). The characteristic disturbances of lipid metabolism found during APR are increased serum TG, TC and LDL-C concentration and decreased HDL-C. During APR, changes occur that promote atherogenesis. Cytokines, such as tumor necrosis factor (TNF) or interleukin (IL)-1 are recognized as prime mediators of these metabolic changes during infection and inflammation.[5]

There are many studies investigating the oxidant/antioxidant status in psoriasis and it has been suggested that increased reactive oxygen species (ROS) and deficient antioxidant system is responsible for the pathogenesis of psoriasis.[6] Increased oxidative stress in psoriasis also increases the risk of atherosclerosis leading to cardiovascular events.[7]

MATERIALS AND METHODS

This cross sectional case control study was performed on 90 individuals aged between 15 and 45 years. The individuals were divided into three groups: psoriatic patients (group I), patients with skin disease other than psoriasis (eczemas, leprosy, vitiligo, acne vulgaris) (group II), and a control group that included healthy volunteers (group III). Lipid profile was assessed in all 90 subjects and compared. Informed and written consent was taken during the study from all the 90 subjects. The total number of subjects

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included in this study was 90. Among these 30 were patients of psoriasis; 30 were patients with skin disease other than psoriasis in which 10 patients of vitiligo, 10 patients of leprosy and 10 patients of acne vulgaris were included and 30 were healthy controls without any disease.

Table 1: Details of Subjects Included in the Study.

Parameter	Group I	Group Ii	Group Iii
Sample Size	30	30	30
Mean Age	37.13 ± 5.61	32.97 ± 8.65	36.57 ± 5.0
Sex	M= 21 (70%) F= 9 (30%)	M= 21 (70%) F= 9 (30%)	M= 21 (70%) F= 9 (30%)
Fbs	100.93 ± 11.37	93.4 ± 12.90	94.47 ± 8.07
S.Cholesterol	214 ± 41.17	149.03 ± 26.97	159.93 ± 24.63
S.Triglycerides	164 ± 44.33	107.43 ± 29.36	114 ± 33.04
S.Hdl	41.3 ± 9.29	44.3 ± 9.48	45 ± 5.79
S.Ldl	270 ± 33.68	83 ± 25.20	91 ± 21.70
S.Vldl	64 ± 8.87	21 ± 5.87	22 ± 6.61
S.Uric Acid	5.93 ± 1.20	4.85 ± 0.87	5.87 ± 0.67
Hs-Crp	3.37 ± 2.96	1.30 ± 0.56	0.84 ± 0.38

Table 2: Analysis of Cases and Controls with Respect to Serum Cholesterol Levels

S.Cholesterol	Group I		Group II		Group III		Annova Test (P Value)
	No.	%	No.	%	No.	%	
<200 Mg/Dl	10	33.3	30	100	30	100	<0.001
200-239 Mg/Dl	14	46.7	0	0	0	0	
≥ 240 Mg/Dl	6	20	0	0	0	0	

In case of psoriasis, serum cholesterol level was borderline high in 46.7% cases, and high in 20% of cases. In other two groups serum cholesterol level was normal in all subjects. On applying anova test for serum cholesterol on all 3 groups, the p value was <0.001, which was statistically significant.

Table 3: Analysis of Cases and Controls with Respect to Serum Triglyceride Levels.

S.TG	Group I		Group II		Group III		Annova Test (P Value)
	No.	%	No.	%	No.	%	
≤150mg/dl	20	66.7	29	96.7	26	86.7	<0.001
>150mg/dl	10	33.3	1	3.33	4	13.3	

As per data suggests. Serum triglyceride level was high in 33.3% of patients with psoriasis as compared to other two groups. On applying anova test for serum triglycerides on all 3 groups, the p value was <0.001, which was statistically significant.

Table 4: Analysis of Cases and Controls with Respect to Serum Hdl Levels.

S.HDL	Group I		Group II		Group III		Annova Test (p Value)
	No.	%	No.	%	No.	%	
≤35 mg/dl	8	26.7	6	20	2	6.7	0.196

As per data suggests. Serum HDL level was below normal range in 26.7% of patients with psoriasis, while in other two groups it was 20% and 6.7% respectively. On applying anova test for serum HDL on all 3 groups, the p value was 0.196, which was not statistically significant.

Table 5: Analysis of Cases and Controls with Respect to Serum Ldl Levels

S.LDL	Group I		Group II		Group III		Annova Test (P Value)
	No.	%	No.	%	No.	%	
>130 mg/dl	19	63.3	0	0	0	0	<0.001

As per data suggests. Serum LDL level was above normal range in 63.3% of patients with psoriasis, while in other two groups it was within normal range. On applying anova test for serum LDL on all 3 groups, the p value was <0.001, which was statistically significant.

Table 6: Analysis of Cases and Controls with Respect to Serum Vldl Levels

S.VLDL	Group I		Group II		Group III		Annova Test (P Value)
	No.	%	No.	%	No.	%	
<32mg/Dl	11	36.7	29	96.7	27	90	<0.001
≥32mg/Dl	19	63.3	1	3.33	3	10	

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As per data suggests. Serum VLDL level was high in 63.3% of patients with psoriasis while in group II only 1 patient out 30 had high VLDL level and in control group 10% of patients had high VLDL level. On applying anova test for serum VLDL on all 3 groups, the p value was <0.001, which was statistically significant.

DISCUSSION

Psoriasis is chronic inflammatory a multi-factorial genetic disease. The lesions in psoriasis develop secondary to T-cell mediated hyper proliferation of keratinocytes which is induced by antigen-presenting cells on the skin.[8] It is accepted that genetic predisposition and environmental factors have a profound effect on the immune system and play a crucial role in triggering lesion of psoriasis.

Psoriasis is associated with increased cardiovascular risk. The chronic inflammation in psoriasis has an unfavourable effect on the lipid profile. Systemic treatments in psoriasis reduce the cardiovascular risk by decreasing the inflammation, but most of these treatments also have adverse cardiovascular effects like dyslipidaemia, hyperhomocysteinemia and hypertension. As a consequence, preventive measures are indicated during long-term treatments.[9] It seems that structural changes in plasma lipids may cause increased risk of atherosclerosis in psoriasis

We found elevated level of total cholesterol, S.triglycerides, S.LDL, S.VLDL and hsCRP in psoriasis group as compare to other two groups where these levels were within normal range. S.HDL was comparatively low in patients with psoriasis but it was statistically not significant.

These results matches with study carried out by Vanizor Kural et al, on 35 patients with psoriasis have shown elevated levels of TC, TG, LDL-C and acute-phase reactants (CRP, ESR, Polymorphonuclear leukocytes, ceruloplasmin and fibrinogen) but HDL level was normal.[10] In our study also we didn't found significant change in HDL-C levels in psoriatic patients.

Other study carried out bt Mallbris et al., on 200 cases of psoriasis showed that there was higher total cholesterol, VLDL-C, HDL-C, apt B and apoA-1 levels compared to normal control group.[11] Piskin in his study on 100 psoriasis cases found significantly higher levels of serum total and LDL-C levels than that of control group.[12]

Aliya Nusrath et al evaluated cardiovascular risk in psoriasis patients and found changes in lipid profile like increase in TG-C, VLDL-C, LDL-C and reduction in HDL-C, and increase in MDA levels which were statistically highly significant when compared to controls.[13]

M. Wakkee et al studied unfavorable cardiovascular risk profiles in untreated and treated psoriasis patients & concluded that psoriasis is associated with an unfavorable cardiovascular risk profile.[9]

DoulatRai Bajaj et al studied lipid profile in psoriatic patients & found that psoriasis is an independent risk factor for hyperlipidaemia and that can lead to obstructive vascular disease.[14]

CONCLUSION

In this study, serum lipid profile has been evaluated in psoriasis patients and compared with the patients having skin diseases other than psoriasis and healthy controls. As we found higher levels of total cholesterol, serum triglycerides, serum LDL and VLDL; we can say there is an increased chance of cardiovascular diseases associated with dyslipidaemia. HDL level was within normal range.

This abnormality must be taken into account for the treatment of patients of psoriasis. These parameters should be regularly monitored and even when all the levels are with-in the normal range lifestyle modifications like diet low in fat and physical exercise must be advised to patients to prevent cardiovascular disease.

The main limitation of this study is small number of the patients in all groups. Additional studies with a large number of patients are needed to validate further.

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