ORIGINAL RESEARCH PAPER

Biochemistry

KEY WORDS: TG, TC, LDL, VLDL, HDL lipid metabolism

AN OBSERVATIONAL STUDY TO COMPARE SERUM LIPID PROFILE IN PSORIASIS AND PSORIATIC ARTHRITIS PATIENTS WITH HEALTHY CONTROLS

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ABSTRACT

Background- Psoriasis and psoriatic arthritis are chronic inflammatory systemic disease characterized by metabolic abnormalities including cardiovascular risk and an oxidative imbalance. This study assesses blood parameters of lipid metabolism. **Aims-** To analyse and correlate lipid profile with psoriasis and psoriatic arthritis. **Methodology-** After Ethical Committee approval, serum triglycerides and total cholesterol was measured in 30 psoriasis and 30 psoriatic arthritis cases and results were compared with 30 age matched controls. Serum concentrations of the lipid metabolism parameters were measured. The Psoriasis Area and Severity Index (PASI) was used to determine disease severity. **Results-** Among the three studied groups, controls had the highest HDL concentration ($p < 0.05$). **Conclusion-** Among patients with psoriasis and psoriatic arthritis patients, we found abnormal lipid levels, which might be due to chronic inflammation in these conditions. Effective treatment of patients with psoriasis and PSA could reduce the risk of cardiovascular diseases.

INTRODUCTION

Psoriasis is a chronic inflammatory immune-mediated skin disease with complex etiology. Genetic predisposition and familial clustering have been proven to be associated with psoriasis.[1] Environmental factors responsible for psoriasis are psychological stress, obesity, tobacco and alcohol usage, streptococcal and viral infections, lack of sunlight, trauma, and usage of certain medications such as lithium, beta-blockers, and antimalarial drugs.[2]

However, systemic inflammatory joint disease is a potentially important confounder in the study of psoriasis patients [3]. It is estimated that 6% to 42% of patients with psoriasis develop psoriatic arthritis (PsA), and there is evidence to suggest that PsA, similar to rheumatoid arthritis and other inflammatory joint diseases, is associated with an increased risk of cardiovascular morbidity and mortality [4].

Dyslipidemia is the most widespread cardiovascular (CV) risk factor. Available results of scientific research point to a direct link between the concentrations of TC, LDL-C and non-HDL-C (total cholesterol concentration minus HDL cholesterol concentration) and the risk of myocardial infarction (MI), stroke and fatal cardiovascular disease (CVD) [5]. The VARO study demonstrated improved identification of high-risk individuals and greater adherence to current treatment guidelines and modern drug therapy [6]. Patients with these diseases have higher Cardiovascular morbidity and mortality rates compared with the general population [7].

It is worth noting that in the general population with coronary heart disease (CHD) exhibits significantly higher levels of TC, low-density LDL-C, glucose, and body weight as compared to those without coronary heart disease. This emphasizes the need for greater attention to be paid to primary prevention efforts to control risk factors in patients of CHD [8], especially if coexisting with psoriasis. As serum lipid alterations may occur in psoriasis or PSA, thus the study includes investigations of parameters related to lipid metabolism.

The main objective of the study is to evaluate the mean difference in serum lipid profile in patients of Psoriasis, Psoriatic arthritis and Healthy individuals.

METHODOLOGY

The study was conducted at the department of biochemistry of SMS Medical College and attached hospitals after taking our ethical committee permission. Study population comprises of three groups (n=30), one was of patients having psoriasis, second group of patients having Psoriatic Arthritis and third group of same age matched controls. All outdoor and indoor patients with Psoriasis and Psoriatic arthritis coming to Dermatology & Rheumatology Dept. of SMS Medical College, Jaipur of age group of 31-65 years who were willing to participate and gave written informed consent in the study were included. We excluded participants who received medications that could affect lipid metabolism (thiazides, β-blockers, local or systemic hormonal formulations, statins, fibrates). Patients did not receive local retinoids or dithranol. The Psoriasis Area Severity Index (PASI) was used to determine the severity of psoriatic skin lesions in patients with psoriasis or PSA.

Statistical Analysis

Data was maintained on excel spread sheet. Analysis was performed using Epi Info-7 software. Differences were considered statistically significant at $p<0.05$ and highly significant at $p<0.001$. The level of significance would be kept 95% for all statistical analysis as per norms.

OBSERVATIONS AND RESULTS

A total of 30 cases each of psoriasis, psoriatic arthritis and age and sex matched healthy controls were screened, examined and recruited as per inclusion criteria.

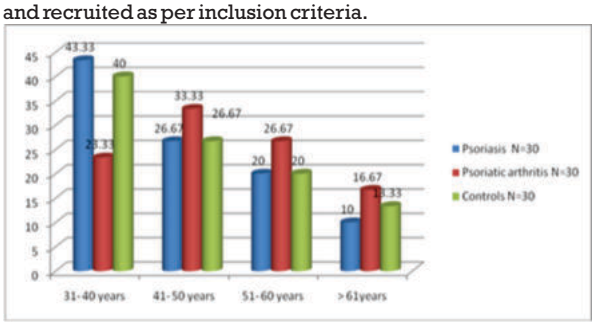

Fig 1: Age Wise Distribution Of Psoriasis, Psoriatic Arthritis

And Controls

Mean age of psoriasis was 40.86 years and of psoriatic arthritis was 40.22 years while mean age of the controls was 41.09 years. The age distribution of the cases and controls projected graphically in Fig. 1

Of the 30 cases of psoriasis that were selected for the study, 22 (73.33%) were males and 8 (26.67%) were females. The ratio of males and females in our study was 2.75:1. Results are projected graphically in Fig. 2

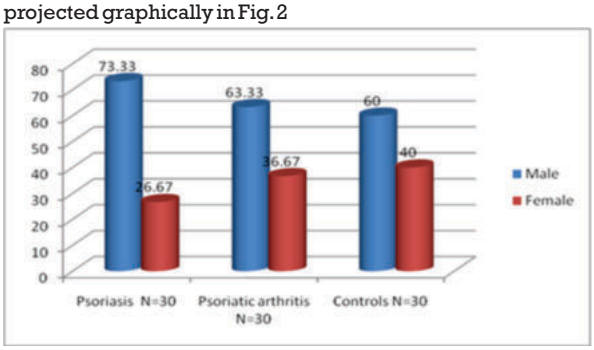

Figure 2: Sex Distribution In Psoriasis, Psoriatic Arthritis And Control

93.3% of the cases of psoriasis, 83.1% of psoriatic arthritis had serum cholesterol values within the normal range as compared to 90% of controls. Thus, no significant difference in cholesterol values was seen in cases and controls (p value 0.454). The results have been demonstrated in Table 1.

Table 1: Abnormal Lipid Profile In Psoriasis, Psoriatic Arthritis And Controls

Abnormal lipid profile	Criteria	Psoriasis (n=30)	Psoriatic arthritis (n=30)	Controls (n=30)	P-value
Total cholesterol	<225mg/dl	28(93.3%)	25(83.1%)	27(90%)	0.454
	>225mg/dl	02(6.7%)	05(16.9%)	03(10%)	
Serum triglycerides	<170mg/dl	22(73.3%)	20(66.7%)	18(60%)	0.548
	>170mg/dl	08(26.7%)	10(33.3%)	12(40%)	
HDL	<35 mg/dl	07(23.3%)	06(20%)	08(26.7%)	0.829
	>35 mg/dl	23(76.7%)	24(80.0%)	22(73.3%)	
VLDL	<40 mg/dl	20(66.7%)	19(63.3%)	23(76.7%)	0.509
	>40 mg/dl	10(33.3%)	11(36.7%)	07(23.3%)	
LDL	<150mg/dl	26(86.7%)	23(76.7%)	28(93.3%)	0.181
	>150mg/dl	04(13.3%)	07(23.3%)	02(6.7%)	

The mean value of serum cholesterol in cases of psoriasis was 193.1mg/dl, mean value of psoriatic arthritis was 214.22 mg/dl which was comparable to the mean value in controls 203.85 mg/dl (p value 0.101). The mean difference of serum total cholesterol in group 1&2 and group 1&3 and group 2&3 was non-significant.

The mean value of serum TG in cases of psoriasis was 127.48, mean value of psoriatic arthritis was 157.26 which was significantly higher than the mean value in controls which was 132.51. The mean difference of serum triglycerides in all three groups were found non-significant.

Table-2 Serum Mean Levels Of Biochemical Parameters In Psoriasis, Psoriatic Arthritis And Controls

	Psoriasis (n=30) Gr-1	Psoriatic arthritis (n=30) Gr-2	Controls (n=30) Gr-3	Mean difference between Gr-1 & Gr-2 (95%CI)	Mean difference between Gr-1 & Gr-3 (95%CI)	Mean difference between Gr-2 & Gr-3 (95%CI)
	Mean ± SD	Mean±SD	Mean±SD			
Glucose(mg/dl)	83.77±11.01	89.64±14.32	81.22±11.32	5.87 (-0.79-12.53)	2.55 (-8.32-3.22)	8.42 (-15.14-1.69)*
TC (mg/dl)	193.31±39.46	214.22±40.02	203.85±39.66	20.91 (0.37-41.44)	10.54 (-9.90-30.99)	10.37 (-30.96-10.22)
TG (mg/dl)	127.48±52.87	157.26±98.05	132.51±84.54	29.78 (-10.92-70.48)	5.03 (-31.41-41.47)	24.75 (-72.09-22.55)
HDL (mg/dl)	48.58±12.47	45.22±11.31	53.85±1.99	3.36 (-9.51-2.78)	5.27 (0.65-9.88)*	8.6 (4.43-12.82)*
LDL (mg/dl)	112.85±27.69	129.74±32.98	118.25±35.21	16.89 (1.15-32.69)*	5.40 (-10.97-21.77)	11.49 (-29.12-6.14)
VLDL (mg/dl)	25.07±10.35	33.04±19.47	25.85±15.84	7.9 (-0.08-16.02)	0.78 (-6.13-7.69)	7.19 (-16.36-1.98)
Uric acid (mg/dl)	6.9±1.11	7.7±0.91	5.3±1.23	0.80 (0.27-1.32)*	1.60 (-2.20-0.99)*	2.40 (-2.95-1.84*
Calcium (mg/dl)	9.93±0.64	8.50±0.63	10.37±0.61	1.43 (-1.75-1.10)*	0.44(0.11-0.76)*	1.87 (1.54-2.19)*

*p<0.05

The mean value of serum HDL in cases of psoriasis was 48.58mg/dl, and in psoriatic arthritis patients was 45.22 which was comparable to the mean value in controls 53.85 mg/dl. The mean difference of HDL - Cholesterol in group 1&2 non-significant and group 1&3 and group 2&3 was significant (p value =0.026, 0.000) respectively.

Mean LDL values in cases of psoriasis was 112.85 and mean LDL value of psoriatic arthritis was 129.74 while mean value in controls was 118.25. The association was not found to be significant (p value: 0.097). The mean difference of LDL-Cholesterol in group 1&2 significant (p value =0.036) and group 1&3 and group 2&3 was non-significant.

The mean values of VLDL in cases of psoriasis, psoriatic arthritis and controls were 25.07, 33.04 and 15.84 respectively. No significant association was seen in VLDL values between cases and controls (p value: 0.339).

DISCUSSION

Psoriasis is a paradigm of a chronic and relapsing inflammatory skin disease which so far was supposed to be restricted to the skin with the exception of PsA. Our study confirmed that patients with psoriasis or PSA have lipid metabolism alterations.

The systemic inflammation present in psoriasis, various systemic treatments for psoriasis and an increased prevalence of unhealthy life style factors may all contribute to this unfavorable cardiovascular risk profile.

Genetic studies demonstrate that psoriasis and cardiovascular disease share common pathogenic features in which, for example inflammatory cytokines like TNF-□andIL-1play an important role. Multiple cardiovascular risk factors seem to be influenced; the blood pressure, oxidative stress, dyslipidemia, endothelial cell dysfunction, homocysteine levels and blood platelet adhesion. [9]

A high male preponderance seen in our study correlates with other published studies. Inderjeet Kaur et al [8] revealed a sex ratio of 2.3:1, whereas Mehta et al [10] reported a sex ratio of 4:1 in their studies. Thus, the sex ratio in our study correlated with the above literature.

There is significant low level of serum HDL in psoriasis and psoriatic arthritis patient as compare of control group. In contrast to our study, in Piskin et al [11] reported normal levels of HDL in psoriatic patients while in Rocha-Pereira [12] reported decreased levels of HDL in psoriatic patients.

The finding of LDL was correlated with the study done by Uyanik on 72 psoriasis patients wherein LDL levels in cases and controls were comparable [13] Rocha-Pereira [12] also concluded the same finding from his study.

The present study has some potential limitations among them the small sample size because of our high standard strict exclusion criteria. Future studies with larger sample size having both sexes along with quantification of body fat content are needed to understand the role of lipids in pathogenesis of psoriasis. We also could not perform follow up lipid analysis in these patients.

CONCLUSION

In this study, we concluded that significant dyslipidemia was mostly observed in all of the study groups. Our data suggest

that psoriasis and psoriatic arthritis patients must be considered as a group at high risk for cardiovascular disease, since the disease was associated with changes in the lipid profile being the risk factor for cardiovascular disease. We suggest early screening of lipid profile in patients at the time of presentation of the disease and further follow up for evaluating the assessment risk as well as treatment of hyperlipidemia including other risk factors in order to modify and prevent the risk of cardiovascular diseases or other diseases.

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