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Study of High Sensitive C Reactive Protein and Lipid Profile in Psoriasis

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Abstract:

Background: *Psoriasis is a chronic, inflammatory skin disease characterized by epidermal hyper proliferation, differentiation and lymphocytic infiltration predominantly of T lymphocytes. Evidence have shown that psoriasis is an independent risk factor for cardiovascular diseases. hs-CRP is an acute phase reactant and best biomarker of inflammation that has been associated with cardiovascular disease(CVD) risk .Hence this study was undertaken to evaluate hs-CRP, lipid profile and Novel Lipid Indices in psoriatic patients.*

Materials and Methods: *The study group consisted of 47 psoriasis cases and 47 healthy controls. PASI (Psoriasis Area and Severity Index) Score was done to assess severity of Psoriasis. Lipid profile (Total Cholesterol, Triglycerides, LDL and HDL) was measured in fully automated analyser. hs-CRP was measured by immuno turbidimetric method. Statistical analysis was done by using SPSS-16 version.*

Results: *Statistically significant ($p<0.05$) increase of hs-CRP was seen in cases (3.6595±3.038) when compared to controls (1.595±1.014). Cholesterol, triglycerides and LDL were found to be increased in cases compared to controls which was statistically significant ($p<0.05$), whereas HDL levels were not statistically significant. hs-CRP levels positively correlated with severity of psoriasis. Among lipid indices CRI-I and CRI-II showed significant increase in cases compared to controls.*

Conclusion: *Present study suggests that psoriatic patients have significant dyslipidaemia which is proatherogenic in nature, which correlated significantly with inflammatory marker like hs-CRP. Early screening of patients helps in early intervention which in turn can reduce mortality.*

Background

Psoriasis is a chronic immune mediated inflammatory skin disease.[1]It affects 2% of general population worldwide.[2]It is characterized by hyper proliferation and abnormal differentiation of epidermal keratinocytes, lymphocyte infiltration, mostly of T-lymphocytes and endothelial vascular changes in the dermal layer such as angiogenesis and dilatation.[3]

It is associated with many comorbid conditions like cardiovascular disease (CVD), type2 diabetes mellitus, metabolic syndrome, Crohn's disease and psoriatic arthritis including decreased quality of life[4]. Changes in plasma lipid composition in psoriatic patients have been suggested as being the cause of the increased risk of atherosclerosis, many of the results remain controversial.[5]

In psoriasis there is cutaneous and systemic overexpression of various pro-inflammatory cytokines and acute phase reactants which are strongly associated with the risk and outcomes of coronary events.[6] High sensitive C-reactive protein (hs-CRP) is an acute phase reactant and a well-established biomarker of inflammation and studies have shown hs-CRP to be the single strongest predictor of cardiovascular disease (CVD) risk. hs-CRP has been shown to be elevated in psoriasis patients and is a risk factor for CVD[7,8].

In this study, we investigated the possible association between disease severity (as measured by the Psoriasis Area

and Severity Index) and the inflammatory marker hs-CRP. The PASI is a widely used method to assess disease severity based on the extent of psoriasis lesions, and the associated erythema, induration and scaling.[9, 10]

There are only a few studies in India regarding the association of inflammatory marker hs-CRP and lipid profile in psoriasis. According to adult treatment panel (ATP –III) of National Cholesterol Education Program LDL is defined as the primary target for lipid lowering therapy in reducing CVD risk. However the role of HDL and other individual Lipid parameters are not well established. None of the studies have shown assessment of CVD risk by novel lipid indices in psoriasis like Atherogenic Index of Plasma(AIP), Castellis Risk Indices(CRI-I,CRI-II), Atherogenic coefficient(AC) and CHOL index[11]. Hence the present study to correlate hs-CRP with severity of psoriasis and lipid profile.

Objectives of the study is to Estimate lipid profile (Total cholesterol, Triglycerides, HDL and LDL) and hs-CRP in Psoriasis patients and to compare the same with healthy controls. At the same time to correlate hs-CRP with lipid profile in patients with psoriasis and assessment of CVD risk by lipid indices.

Methods

The study was approved by the ethical committee of Mysore Medical College and Research Institute, Mysore, and informed written consent was obtained from all participants.

The study population comprised of 47 adult psoriasis patients in the age group of 20-50 years of both sexes with psoriasis from the Dermatology outpatient clinic of this hospital and 47 age and sex matched healthy volunteers from the same hospital. Patients with past or present history of smoking, diabetes mellitus, hypertension, ischemic heart disease, chronic liver and kidney diseases, acute infections, Hyperlipidaemia, Lipid lowering drugs for last 3 months, obesity and hypothyroidism were excluded from the study. Fasting sample was collected under aseptic precaution. Lipid profile parameters were measured by using commercially available kits using fully automated analyser (LDL was measured directly). hs-CRP was measured by immunoturbidimetric method using commercially available kit. PASI score was used to assess severity of the psoriasis and grading of psoriasis. Risk of future atherosclerosis assessed by novel lipid indices such as atherogenic index of plasma (AIP), CRI-I and CRI-II, Atherogenic coefficient and CHOL index.

Statistical analysis

The results were expressed as Mean ± SD. To evaluate the differences between groups, the students't'-test was used. Pearson correlation coefficient is used for comparison. Statistical analysis was done using the statistical software: SPSS-16.

Results

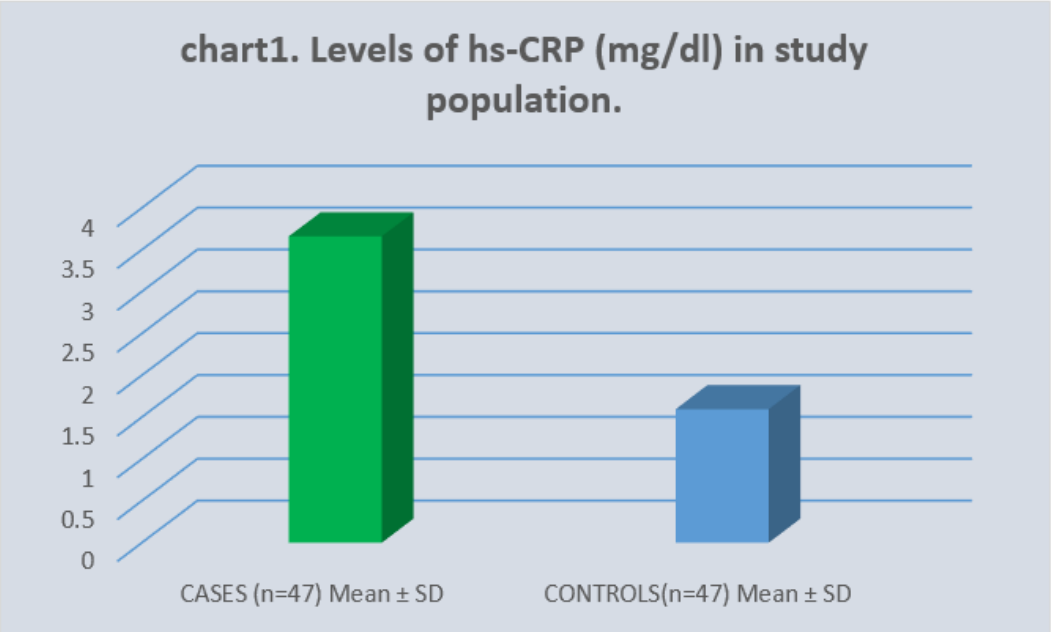
Table 1 shows age and sex wise distribution of study population and more number of psoriasis cases were found in the age group of 40-50.Table 2 shows comparison of hs-CRP levels between cases and controls. There was a significant increase in hs- CRP levels in cases when compared to controls ($p<0.05$) depicted in chart 1.

Table 1: Profile for the study Population

AGE IN YEARS	CASES (n=47)		Controls (n =47)	
	Male	Female	Male	Female
20-30	7	6	10	6
30-40	6	7	6	6
40-50	13	8	9	10

Table 2: Levels of hs -CRP in study population

	CASES (n=47) Mean ± SD	CONTROLS(n=47) Mean ±SD	p value	t value
hs-CRP (mg/dl)	3.6595±3.038	1.595±1.014	<0.05	o.54



The present study showed statistically significant increase (p<0.05) in cholesterol, triglycerides and LDL levels with non-significant decrease in HDL values in cases compared to controls. (Table 3 and chart 2)

Table 3: Lipid profile of study population

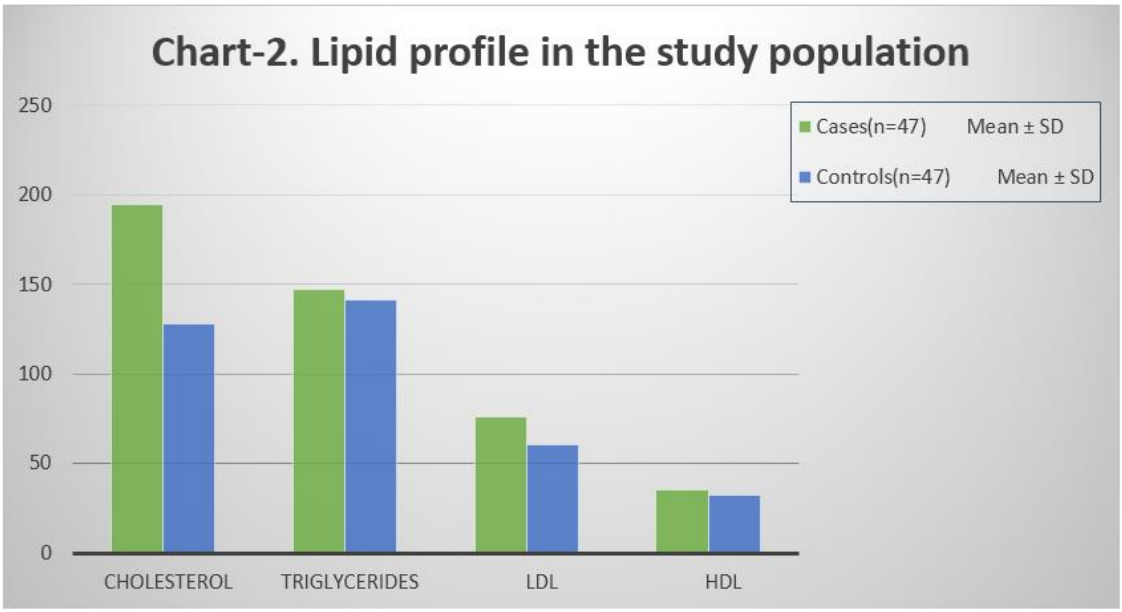
	Cases(n=47) Mean ± SD	Controls(n=47) Mean ± SD	p value
Cholesterol mg/dl	194.638± 56.150	128.021± 43.08	<0.05
Triglycerides mg/dl	147.170 ±83.807	140.957 ± 80.192	<0.05
LDL mg/dl	76.085 ± 24.39	60.595 ± 16.83	<0.05
HDL mg/dl	35.148 ± 12.263	32.063 ± 8.192	Non-significant

Table 4 shows Pearson correlation of hs-CRP values with lipid parameters. In cases, the hs-CRP showed positive correlation with triglycerides and negative correlation with HDL with significant p value of <0.005.

Table 4: Correlating hs-CRP with lipid parameters

	Cases		Controls	
	r value	p value	r value	p value
hs-CRP v/s cholesterol	0.113	0.473	0.097	0.217
hs-CRP v/s Triglycerides	0.433	0.005*	-0.913	0.137
hs-CRP v/s LDL	0.317	0.013	-0.877	0.278
hs-CRP v/s HDL	-0.669	0.005*	-0.252	0.314

*p value <0.005 is statistically significant.



Significant correlation of hs-CRP and PASI ($p<0.001$) was seen in the present study. Mean value of hs-CRP in PASI<10 (mild psoriasis) is 2.684±1.635 mg/dlwhile mean value of hs-CRP with PASI>10 (moderate to severe psoriasis) is 4.933±3.84 mg/Li. (Table -5).

Table 5: Correlating the values of hs-CRP with grading of psoriasis

	Grade I Mild (<10)	Grade II Moderate to severe (>10)	p value	t value
hs-CRP(mg/dl)	2.684 ± 1.635	4.933±4.44	0.0019	3.259

Grading of psoriasis is based on PASI Score.

Table 6 shows results of different novel lipid indices used to assess atherogenic risk in psoriasis patients using lipid parameters.

Table 6: Novel lipid indices in psoriasis

	CASES Mean ± SD	CONTROLS Mean ± SD	p value	t value
AIP Log(triglycerides/HDL_ Cholesterol)	0.211±0.319	0.231± 0.283	0.749	0.320
CRI-I (cholesterol/HDL)	5.99 ± 2.21	4.03± 1.25	0.001*	5.259
CRI-II (LDL/HDL)	2.234 ± 0.71	1.959 ± 0.586	0.0443*	2.039
Atherogenic coefficient (cholesterol-HDL)/HDL	4.99±2.21	3.036±1.25	<0.001*	5.259
CHOL index (LDL-HDL)	41.021±21.253	28.531±16.145	0.001*	3.208

*P value <0.05 statically significant.

Discussion

The present study showed statistically significant increase ($p<0.05$) in cholesterol, triglycerides and LDL levels. Decreased HDL values in cases compared to controls was not statistically significant. This is in accordance with studies done by Piskin et al[12], Dsouza PH et al.[13]. A few studies have shown no alteration of lipid profile in patients with psoriasis[5]. Statistically significant (p value<0.005) increase of hs-CRP seen in cases when correlated with triglycerides. The present study showed dyslipidaemia of proatherogenic nature in psoriasis. It gives an indirect evidence of atherosclerosis and increased prevalence of coronary artery disease seen in psoriasis. The molecular mechanism underlying dyslipidaemia in psoriasis is not yet established. As Psoriasis is an inflammatory condition, increased hs-CRP observed in the present study suggests on going inflammatory changes in psoriasis.

Several reports have shown premature atherosclerosis and increased prevalence of coronary artery disease in psoriasis[14].The increased risk is due to the effects of chronic inflammatory changes, particularly the infiltration of T cells and the subsequent secretion of pro-inflammatory cytokines[15].

Several reports have shown that hs-CRP enhances the expression of local endothelial cell surface adhesion molecules, monocyte chemo attractant protein1, endothelin 1 and endothelial plasminogen activator inhibitor 1, tissue factor in monocytes and LDL uptake by macrophages. It co localize with the complement membrane attack complex within atherosclerotic lesions. It also reduces endothelial nitric oxide bioactivity[16]. Hence increased hs-CRP seen in present study not only shows ongoing inflammatory process but it is an independent indicator of cardiovascular risk in psoriatic patients.

Present study showed statistically significant decrease in HDL in cases compared to controls, also hs-CRP did not correlate well with individual lipid parameters. However Lipid indices such as CRI-I, CRI-II,and CHOL index which takes into account both proatherogenic (TC, LDL, Tg) and protective fractions (HDL) have shown statistically significant increase in psoriasis cases compared to controls. More prospective studies are required in assessing the CVD risk using these novel lipid indices in psoriasis patients.

Conclusion

Psoriatic patients should be considered as a risk group for CVD and early identification should be done by using biomarker hs-CRP and lipid profile. Early screening in patients helps in early intervention which in turn can reduce mortality .Addition of hs-CRP and novel lipid indices to standard lipid screening may improve cardiovascular risk prediction among those with high as well as low cholesterol levels.

Competing Interests: None.

Authors Contributions:

Dr.SJ (First) and Dr.MS helped in the conception and design and execution of the study, Dr.SJ and Dr.SJ (third) prepared the manuscript, Dr.MS finalised the manuscript, Dr.SCS helped in collection of samples and in statistical analysis.

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