Research Article

Serum High Sensitivity CRP (HsCRP) in Psoriasis

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Abstract

Introduction: Psoriasis is a common and recurrent proliferative inflammatory skin disease that has been associated with abnormal plasma lipid metabolism and with high frequency of cardiovascular morbidity and mortality. Dyslipidemia in psoriatic patients make them more prone for CAD. Highly sensitive C reactive protein (HsCRP) is a recent and sensitive marker of the inflammation particularly in atherosclerotic changes. So the levels of hsCRP and lipid profile were evaluated in psoriatic patients. **Material and Methods**: The study included 35 psoriatic patients and 35 healthy age and sex matched controls. Both the groups were evaluated for serum lipid profile and HsCRP levels. **Results:** The study showed that there was a significant rise in the levels of hsCRP in patients of psoriasis as compared to the controls ($p<0.001$) These psoriatic patients were also significantly dyslipidemic as compared to the controls. **Conclusion:** The study showed that psoriatic patients are more prone for atherosclerotic changes and CAD. Raised hsCRP can be considered as an added risk factor in Psoriatic patients with regard to coronary artery diseases. Special attention thus should be given if diagnosed earlier for lifestyle modification and exercise in these patients to minimize the atherosclerotic changes. Role of antioxidant supplementation needs further studies in patients of psoriasis.

Key words: Dyslipidemia, Psoriasis, hsCRP, Coronary artery disease

Introduction

Psoriasis is a common disease involving 125 million patients worldwide. Psoriasis causes significant disability in many individuals, especially women and young patients. About 80% of patients with psoriasis report that the disease has a negative impact on their lives for a variety of reasons, including physical symptoms, embarrassing physical appearance (particularly because it begins at "30 years of age in 60% of cases) helplessness, frustration, anger, anxiety, depression, and increased use of alcohol [1].

The cause of psoriasis is unknown, and its pathogenesis is not fully understood [2]. Psoriasis has a complex genetic predisposition and inheritance pattern, plus an environmental component. Recent studies implicate smoking and obesity as modifiable risk factors for psoriasis [3,4].

The pathophysiology of psoriasis is incompletely understood but appears primarily due to a cell-mediated adaptive immune response involving cytokines of Th1 and Th17 pathway The leukocyte infiltrate in psoriatic skin lesions contains mainly T cells positive for clusters of CD-4 and CD-8[5,6].

Psoriasis is associated with several other disorders, including diabetes mellitus, the metabolic syndrome, cancer, CAD, etc [7]. Conditions that are known contributors to CAD-dyslipidemia, obesity, hypertension, and diabetes mellitus are more prevalent in patients with psoriasis than in the general population and patients with other dermatologic disorders [8,9].

Dyslipidemia especially elevated low-density lipoprotein (LDL) cholesterol is common in patients with psoriasis, and the degree of elevation generally correlates with the severity of psoriasis. Lipid abnormalities often can be detected at the onset of psoriasis, suggesting that they may be genetically acquired [8, 10].

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CRP is a protein in the blood that is produced by the liver and tends to increase when there is inflammation in the body. CRP is an acute phase protein that appears in circulation in response to inflammatory cytokines & serves as a non specific biomarker for systemic inflammation. Research now indicates that CRP likely plays a direct active inflammatory role in blood vessels leading to development of atherosclerosis [11].

CRP levels may rise up to 3000 folds over circulating levels seen in apparently healthy individuals (normal CRP levels 10mg/L). Conventional CRP assays can not detect low levels of rise in CRP due to subtle causes of inflammation in various diseased states particularly cardiovascular disease [12].

The high sensitivity C-reactive protein (hsCRP) assay is a quantitative analysis of very low level of CRP in blood (<10mg/L). This assay is being increasingly used as a marker of atherosclerosis which can lead to myocardial infarction and hence it is used as a predictor of myocardial infarction, future hypertension, stroke independent of abnormal lipid profile [13,14].

In view of the above facts this study is designed to correlate dyslipidemia and hsCRP levels in patients of psoriasis.

Material and Methods

- **Study design** - Case Control study
- **Study population** - Sample for lipid profile and hsCRP in psoriatic patients attending the OPD of Dermatology Department.
- **Place of study** - Bhausaheb Sardesai Talegaon Rural Hospital, Talegaon Dabhade.
- **Plan of study** - Considering prevalence of cardiovascular disease in psoriatic patient as 23% (reported by other studies - investigative report- Psoriasis and metabolic syndrome. ACTA Dermatology, venerology 2007;87:506-509) with 95% confidence interval & 80% power of test with 2% allowable errors the estimated sample was 35 patients of psoriasis.
- The subjects were categorized into two groups
  1) Control - 35 healthy age & sex matched subjects
  2) Cases - 35 patients of psoriasis
- Criteria for dyslipidemia: (according to Adult treatment panel lll guidelines) [15]
  - ✓ Serum total cholesterol : >200mg/dl
  - ✓ Serum total LDL : >100mg/dl
  - ✓ Serum total HDL : <40mg/dl
  - ✓ Serum triacylglycerol : >150mg/dl
- If one or more of the above parameter is observed the individual will be considered as dyslipidemic.

- **Inclusion criteria :**
  Patients exclusively having psoriasis with no other major illness like diabetes mellitus, hypertension, CAD etc.

- **Exclusion criteria :**
  Patients with known major illness like Hypertension, Ishemic heart disease, Diabetes mellitus, inflammatory disorders like SLE, rheumatoid arthritis & hypotension, and other hormonal disorders.

1. HsCRP was estimated by turbidimetric method-

Principle

The CRP ultrasensitive is a quantitative turbidimetric test for the measurement of low levels of C-reactive protein (CRP) in human serum or plasma [16].

Latex coated with specific anti-human CRP is agglutinated when mixed with samples containing CRP. The agglutination causes an absorbance change depend upon the CRP contents of the patient sample that can be quantified by comparison from a calibrator of known CRP concentration.

The centre for disease control and prevention (CDC) and American heart association (AHA) recommended the following interpretation of hs-CRP results-:

- <1 mg/l Low risk
- 1-3 mg/l Average risk
- >3 mg/l High risk

2. Lipid profile will be estimated by-

i. Cholesterol :- Cholesterol oxidase method [17]
ii. Serum Triacylglycerol:- Trinder's method [18]
iii. Serum LDL:- Direct LDL kit method [19]
iv. Serum HDL:- Direct HDL kit method [19]

Statistical Analysis-

The values were expressed as mean ± SD. The statistical data is evaluated by using students unpaired't'test.

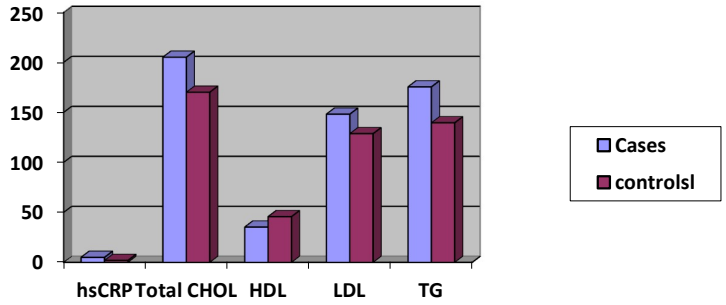
Observations and Results

There was a significant rise in serum hsCRP levels in patients of psoriasis when compared with the controls. ($p<0.001$). It was also observed that the levels of serum total cholesterol, LDL, Triacylglycerol were also increased significantly ($p<0.001$) as compared with the age and sex matched controls. Serum HDL level was decreased significantly in the psoriasis patients as compared to the control group. [Table1, Graph1]

Table 1: Comparison of serum hsCRP levels and lipid profile in patients of psoriasis and controls

	HsCRP	Total Cholesterol	HDL	LDL	TG
Cases	5.03	205.14	35.31	148.2	175.48
Controls	1.94	170.14	45.74	128.7	139.57
P values	<0.001	<0.001	<0.001	<0.001	<0.001

Graph 1:- Comparison of levels of serum hsCRP and lipid profile in psoriatic patients and controls



There was a positive correlation between serum hsCRP levels and serum total cholesterol, LDL, Triacylglycerol levels in patients of psoriasis whereas there was a negative correlation between hsCRP levels and serum HDL in patients of psoriasis.

Discussion

Psoriasis is associated with cardiovascular disease including atherosclerosis and thrombosis (e.g. myocardial infarction) [20]. In the present study, significant dyslipidemia was observed in psoriatic patients as compared to controls [table 1]. This is in concurrence with other studies [21,22]. Dietary factors and socioeconomic status could account for it. The lipid abnormalities seen in psoriasis might facilitate and maintain the inflammatory reaction in the skin [23].

Cholesterol ester transfer protein (CETP) could play a plausible role in increased LDL and decreased HDL-C levels. It transfers the esterified cholesterol from HDL (HDL 2) to VLDL and LDL and replaces it with triacylglycerol. LDL, so altered, is a potential substrate for hepatic lipase.

The enzyme plays a major role in lipoprotein metabolism as a lipolytic enzyme and hydrolyzes triglycerides and phospholipids in chylomicron remnants, IDL, and HDL [24]. The HsCRP levels are also significantly raised in psoriatic patients as compared to controls. Similar findings are observed by Ashish kumar et al[25,26]. CRP itself, beyond serving as a biomarker, may be an active inflammatory protein with a role in endothelial cell dysfunction and vascular remodelling. Psoriasis is characterized by increase in the immunological activity of type 1 helper T cells. Cytokines such as TNFα and interleukin 6 seem to play a central role.

TNFα has also been shown to be a potent activator of terminal kinase, which stimulates activator protein1, a major regulator of proinflammatory activity [23].There is a positive correlation though not significant between raised serum HsCRP levels and dyslipidemia in patients of psoriasis in this study.

Psoriatic patients already are more prone for CAD and thus raised hsCRP levels make them further more prone for atherosclerotic changes [27] C-reactive protein is an important pathogenic factor for atherosclerosis and

induces several reactions involved in atherothrombogenesis:

- Activates complement and attacks monocytes
- Incites endothelial dysfunction
- Augments a procoagulant state
- Contributes to plaque instability/rupture

As the level of hsCRP indicates the inflammatory changes occurring at a low level, if estimated early in the process, it would be beneficial. Simple measures like changes in lifestyle, modifications in the diet and exercise may minimize or delay the atherosclerotic changes.

Similar findings were observed by Gelfand, Sommer, Cohen & other report that have been published previously [21,28.29].

Supplementation of antioxidants to these psoriatic patients may be helpful in curbing the free radicals and minimizing the atherosclerotic changes. Further studies need to be carried out in this regard.

Conclusion

The present study showed that serum hsCRP levels in psoriasis patients are significantly higher than controls. Thus raised hsCRP can be considered as an added risk factor in Psoriatic patients with regard to coronary artery diseases. Dyslipidemia in psoriatic patients require special attention, and so addition of antioxidants to the conventional ways of treatment may prove therapeutically useful.

Thus, raised serum hsCRP level in association with dyslipidemia in patients of psoriasis should be considered as an added risk factor with a special role of antioxidants in the conventional therapy. Further follow up of such cases can thus be done as a future part of the study.

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