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A Study of Lipid Profile in Patients Diagnosed With Psoriasis

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Abstract: *Background: Psoriasis is an inflammatory dermatosis that is characterised with hyperproliferation of keratinocytes and inflammatory inflammation in the epidermis and dermis. The high prevalence of atherosclerosis is reported in psoriatic patients which is attributed to high serum lipid profile marking an abnormal lipid metabolism. In this study, the lipid profile of patients were compared with that of controls.*
Aims and objectives: 1) Assessment of fasting lipid profile in patients diagnosed with psoriatic patients. 2) Assessment of Correlation between fasting lipid profile and severity of psoriasis. 3) Assessment of results to review the possible usefulness as markers for risk factors of development of cardiovascular disease.
Method: this study was designed and conducted as a case control study with 40 cases and 40 controls. The serum cholesterol, triglyceride and LDL was significantly higher in psoriatic patients ($p<0.05$) but not for HDL ($p > 0.05$).
Results and Conclusion: this study shows that high serum lipid profile is significantly more common in psoriasis which may be responsible for higher prevalence of cardiovascular accident in psoriatic patients. It may be useful to do early screening and treatment of hyperlipidaemia in psoriasis to prevent any cardiovascular events and complications.

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I. Introduction

Psoriasis is a lifelong chronic inflammatory skin disorder affecting up to 1-2% of the world's population [1]. Psoriasis is a non-contagious, chronic recurrent inflammatory dermatosis that produces plaques of thickened, scaly skin due to hyperproliferation of keratinocytes and inflammatory infiltration [2]. The exact cause is unknown, yet a combination of genetic predisposition and environmental factors are suspected to be involved. Although it may involve all age groups, the mean age of its incidence is 17.8 years [3]. The disease is characterized by increased keratinocyte proliferation and alteration in dermal and epidermal T-cells, monocytes-macrophages and neutrophils. Increased antigen presentation by dendritic cells and their presentation to T-lymphocytes lead to the following changes: T-cell activation and secretion of type 1 (TH1) cytokines like interferon, interleukin-2 and tumor necrosis factor. These cytokines induce inflammatory changes in the epidermis, yielding thick scaly plaques [4,5].

Psoriasis has been associated with an increased morbidity and mortality from high frequency of cardiovascular events. This seems to be related to the severity of psoriasis, considering that it occurs much more frequently in patients presenting with large areas of body affected with psoriatic lesions [6]. Atherosclerosis commonly exists in psoriatic patients with high prevalence of cardiovascular disorders and predisposition to occlusive vascular disease. High serum lipid profile has been suggested in its pathogenesis.

Earlier data has been suggested that abnormal lipid profile Psoriasis has been associated with an may be the reason for the increased risk of cardiovascular diseases in these patients [7,8]. However, the pathogenesis of athero-thrombotic events in psoriasis patients remains to be recognized. Multiple factors including abnormal lipids and lipoprotein profiles and risk factors such as hypertension, obesity, diabetes mellitus have been associated with psoriasis [9]. Several reports suggests that psoriatic patients have pro-atherogenic lipid profile including increased levels of serum triglycerides, LDL-cholesterol, VLDL-cholesterol and low HDL-cholesterol levels.

The chronic inflammations, a main feature of psoriasis, are associated with hyperlipidemia [10]. The up-regulation of T helper-1 mediated cytokine cascades interferon-γ, tumor necrosis factor-α, interleukin-1,6 (IFN-γ, TNF-α, IL-1, IL-6) and subsequent inflammation appear to be a likely trigger for acute coronary syndromes [11]. Furthermore, chronic inflammation in psoriasis leads to increased insulin-like growth factor - II (IGF-II) in the skin and blood of psoriatic patients [12].Insulin-like growth factor - II (IGF-II) promotes epidermal proliferation and is also linked to hyperlipidemia and in promoting atherosclerosis [13]. Also in psoriasis there is Increases in production of oxygen metabolites due to the presence of inflammatory cells (polymorph nuclear leukocyte) in the superficial dermis and epidermis that lead to damage of the surrounding tissue by releasing reactive oxygen species. When the oxidative stress develops, it leads to the oxidative damage

of lipids and protein [14]. Oxidation of the low-density lipoproteins (LDL) results in the production of modified LDL which increase incidence of atherosclerosis in psoriatic patient [15].

Aims And Objectives:
This is a growing concern in the field of psoriatic patients with co-existing cardiovascular disorders hence this study is designed to evaluate the role of Fasting lipid profile in psoriatic patients and its association with the severity of the disease.

1) Assessment of fasting lipid profile in patients diagnosed with psoriatic patients.
2) Assessment of Correlation between fasting lipid profile and severity of psoriasis.
3) Assessment of results to review the possible usefulness as markers for risk factors of development of cardiovascular disease.
4) Statistical evaluation, interpretation, comparison and correlation of the findings obtained from testing.

II. Materials And Methods:

The present case control study was carried out in the Department of Biochemistry, Silchar Medical College and Hospital, Silchar, Assam. This study was conducted between January 2018 and June, 2018. About 40 known psoriatic patients and 40 healthy controls of both sexes were included in the study. Informed consent and structured questionnaire of each patient were recorded. The patients were aged between 30yrs to 70yrs. Psoriasis of all types are included in the study. All patients were subjected to full history taking, Clinical dermatological examination, psoriasis area and severity index (PASI scoring). By estimating the extent of the body surface involvement, scaling in percentage and scoring the erythema, thickening of the affected areas (scalp, trunk, the lower limb and upper limb), the severity of the disease was determined. Laboratory testing including lipid profile which includes triglyceride (TG), low density lipoproteins (LDL), Cholesterol and high-density Lipoproteins (HDL). Patients with diseases that can cause secondary hyperlipidaemia have been excluded from study, such as hypothyroidism, diabetes mellitus, nephrotic syndrome, chronic renal insufficiency, obstructive liver disease, and connective tissue disease. Also, Patients on medications, such as beta blockers, thiazides, corticosteroids, and retinoids were excluded from the study. An overnight fasting blood sample were collected under all aseptic precautions 5-8 ml of blood was collected and was analysed by methods for following parameters:

- Total Cholesterol (TC) by enzymatic end point cholesterol esterase, CHOD-POD methods.
- Serum triglyceride [TG] by Enzymatic method- Glycerol phosphate/peroxidase**.**
- HDL cholesterol was estimated by direct enzymatic end point method.
- LDL-Cholesterol by Friedewald's formula.
- VLDL-Cholesterol by Friedewald's equation- TG/5.
- LDL-c = Total cholesterol(mg/dl) – HDL- c (mg/dl) - (TG (mg/dl)/5)

III. Results And Discussion:

All statistical analysis was done using graph pad stat statistical software. This study was done to analyse the use of serum fasting lipid profile in patients with psoriasis as a cardiovascular risk marker and the results were compared with healthy controls. In this analysis, p-value <0.05 was considered to be statistically significant.

	CONTROLS n= 40	**CASES n= 40**	**95% CI**	**p - Value**
Total Cholesterol (mg/dl)	**155 + 35**	**217 + 40.8**	**203-230**	**0.0001**
Triglyceride (mg/dl)	**132 + 19.5**	**181 + 56**	**163.09 -198**	**0.00025**
HDL(mg/dl)	**45 + 15**	**43 + 7**	**40.76-45.24**	**0.07**
LDL (mg/dl)	**103 + 40.7**	**170 + 20**	**163.6-176.4**	**0.001**
VLDL (mg/dl)	**23 + 5**	**35 + 10**	**31.80-38.2**	**0.001**
TC/HDL	**4.2 + 1.00**	**5.04+1.78**	**4.4-5.6**	**0.0049**

The results showed that Total Cholesterol was raised in patients (217 + 40.8 mg/dl) compared to controls (170 + 35 mg/dl) (p = 0.0001) which indicates that patients are at a higher cardiovascular risk as compared to controls. There was a significant increase in Triglyceride levels in patients (181+ 56 mg/dl) compared to controls (140 + 19 mg/dl) (p = 0.00025). Again, HDL in patients and control groups did not show

a significant difference. As for serum, LDL values, it was high in psoriasis patients compared to control group with $p < 0.05$ which indicates statistical significance.

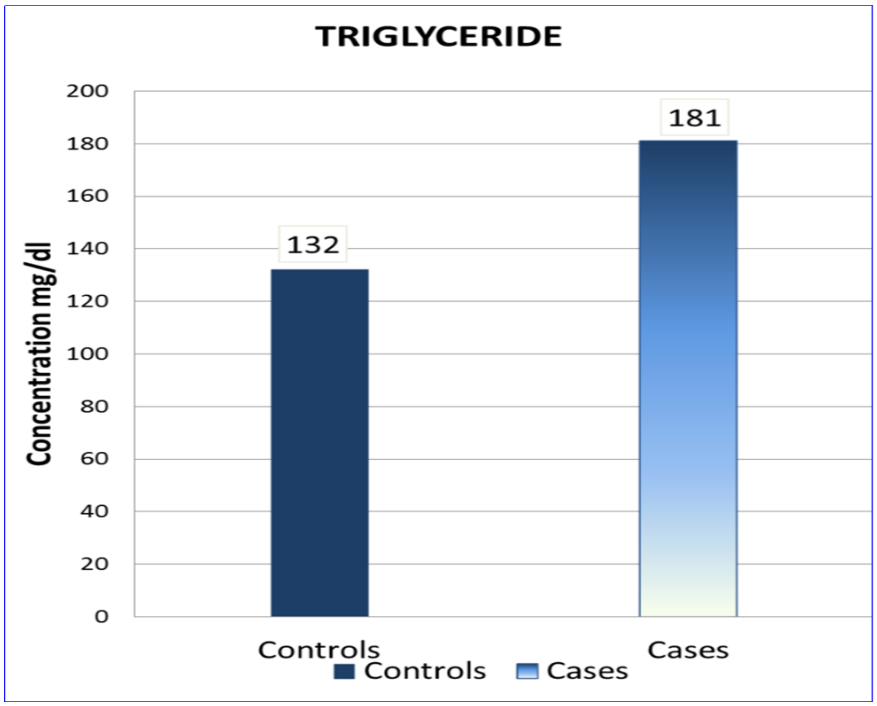

FIGURE 1: showing the distribution of serum triglyceride levels in studied groups.

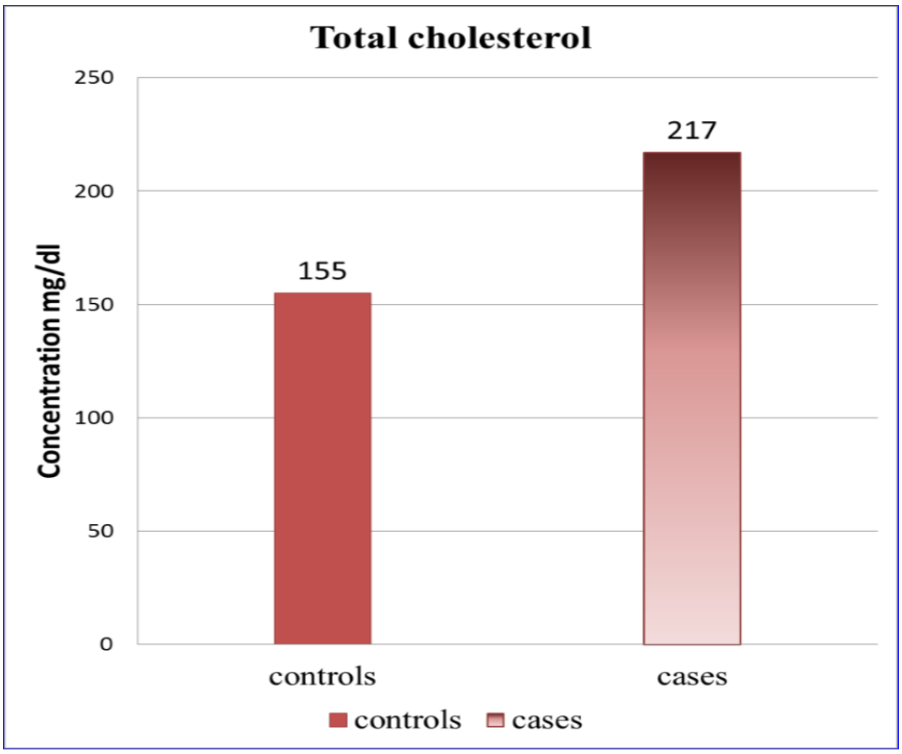

FIGURE 2; showing the distribution of serum total cholesterol in studied groups

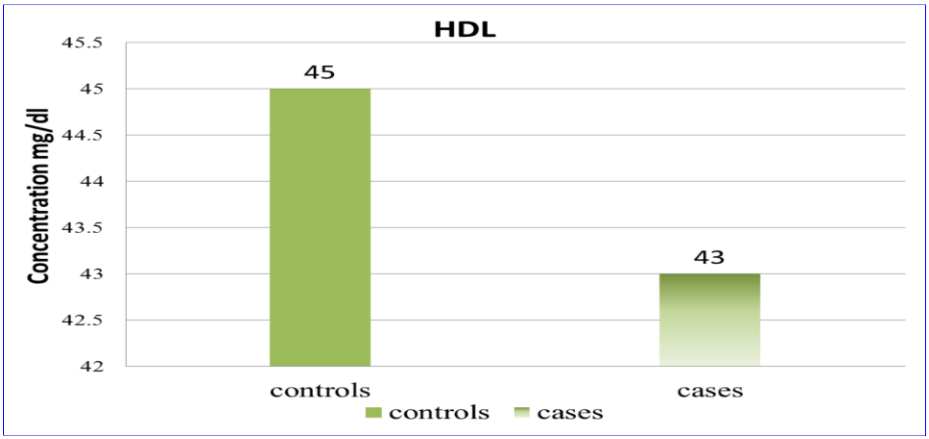

FIGURE 3: showing the distribution of serum HDL levels in studied groups.

IV. Conclusion:

In the study, total cholesterol and triglyceride levels were significantly raised in psoriatic patients ($p < 0.05$). This study is in contention with Crowsen et al whereas Seishma et al observed normal values for cholesterol and HDL. This correlation between lipid profile and psoriasis maybe due to abnormal lipoprotein metabolism. This may be related to high incidence of atherosclerosis due to low levels of Apo-protein C3 which is suggested to inhibit lipoprotein lipases and triglyceride lipases, enzymes which are responsible for metabolising triglyceride. There is also an indication of down–regulation of Apo-protein E expression leading to increased TG and LDL levels. Increased abnormalities in homeostasis of lipid metabolism leading to increased progression towards cardiovascular risks indicates the dire need for fasting lipid profile as a routine tests in patients with psoriasis. Along with increased rates of abnormal lipid profile detection, the need to treat and manage the prognosis is of utmost importance to reduce mortality.

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