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STUDY OF LIPID PROFILE AND VITAMIN C LEVELS IN PSORIASIS

Biochemistry

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ABSTRACT

Background: Psoriasis is a skin disorder associated with abnormal lipid prolife and decreased antioxidants. Dyslipidemia leads to Cardiovascular diseases which increase mortality and morbidity in psoriasis patients .

Objectives: To estimate and compare lipid profile and Vitamin C levels in Psoriatic patients and healthy controls.

Materials and methods : A case control study was done on 80 individuals (40 Psoriatic patients as cases and 40 healthy controls). Serum total cholesterol, triglycerides , high density lipoprotein and Vitamin C levels were estimated.

Results : The serum levels of total cholesterol, triglycerides, low density lipoprotein were significantly increased in cases whereas high density lipoprotein and Vitamin C levels were decreased in cases as compared to controls.

Conclusion: Psoriasis is a high risk factor for Cardiovascular diseases which can be prevented by early screening and treatment of hyperlipidemias .Vitamin C supplementation is recommended to prevent skin damage.

KEYWORDS

Psoriasis , Lipid Profile, Cardiovascular Diseases

INTRODUCTION

Psoriasis is a common, chronic and recurrent inflammatory skin disease that can occur due abnormalities in essential fatty acid metabolism, lymphokine secretion, free radical generation, lipid peroxidation and eicosanoid metabolism and is associated with increased cardiovascular events (1).

In India the prevalence of Psoriasis varies from 0.44% to 2.8%(2). The etiology of Psoriasis is unknown while genetic, metabolic and immunological mechanisms can be attributed to its cause (3).

Lipid abnormalities are detectable in Psoriasis patients at the earliest stages of the disease and thus may be genetically determined . Psoriasis is a multisystem disease. Multiple factors including aberrant lipid profiles, increased oxidative stress, decreased antioxidant capacity and risk factors like hypertension, obesity, diabetes mellitus have been associated with it (4).

Chronic inflammation, a characteristic feature of Psoriasis may play a role in the initiation and progress of dyslipidemia (5). A number of pro-inflammatory cytokines like tumor necrosis factor-alpha, interleukins (IL-1,2,6,8,12,18) and interferon gamma are implicated in the generation of atherosclerotic plaques(6). Inflammation causes disturbances in lipid metabolism which play an important role in pathogenesis of Psoriasis and patients with Psoriasis have increased risk of arterial and venous occlusive disorders (7).

Increased ROS production during inflammatory process in Psoriasis causes depletion of antioxidant mechanisms and lipid peroxidation (8).Vitamin C is most effective water soluble antioxidant and ROS scavenger (9). Among the skin antioxidants, Vitamin C has demonstrated a protective role against ultra violet injury, an exacerbating factor for Psoriasis (10). Studies have shown decreased Vitamin C levels in Psoriasis(11,12).

As, Psoriasis patients present with an abnormal lipid profile, depletion of antioxidants defenses and lipid peroxidation that promote atherogenesis. Hence this study intends to evaluate serum lipid profile and vitamin C levels in Psoriasis patients.

MATERIALS AND METHODS

The study was conducted in the Department of Biochemistry, Kurnool Medical College and Department of Dermatology, Government General Hospital, Kurnool after Institutional Ethical Committee approval during July 2015 to July 2016.

Selection of the Study Group:

A total of 80 patients in the age group of 30-60 years of both the sexes were selected for the study. Among them, 40 psoriatic patients were selected as cases. The remaining 40 age and sex matched healthy individuals were selected as controls.

Inclusion Criteria:

Both male and female individuals in the age group of 30-60 years.
Psoriasis patients.

Exclusion Criteria:

Patients with Diabetes, hypertension, family history of hyperlipidemia, renal and liver diseases, hypothyroidism, connective tissue disorders, patients on treatment with lipid lowering drugs, Vitamin C tablet intake, smokers, alcoholics were excluded from the study.

Sample collection:

The study objectives were explained and informed consent was obtained from study participants. Under aseptic precautions, 5ml venous blood sample in fasting state (12 hours) was collected by venepuncture into plain vacutainers. Hemolysed samples were discarded. Serum was separated by centrifugation and Serum total cholesterol, serum triglycerides, high densit lipoprotein cholesterol (HDL-C) were measured. Serum total cholesterol was estimated by Cholesterol oxidase/ Peroxidase method.Triglycerides were estimated by Glycerol phosphate oxidase / Peroxidase method.Serum high density lipoprotein was estimated by Direct detergent method , all were enzymatic kit methods using Semiautoanalyser. Serum Vitamin C was estimated by 2,4 Dinitrophenylhydrazine method in colorimeter. Serum low density lipoprotein cholesterol(LDL-C) was calculated by applying Friedwald's equation: LDL=TC-HDL-TG/5.

Data Analysis:

The data entered in Microsoft Excel 2007 and analysed using statistical software Epi-info 3.4.5. Numerical variables were reported in terms of mean and standard deviation. Statistical analysis of results was done by 'Z' test and variables showing P value < 0.001 were considered as statistically significant.

RESULTS

The results of the present study are shown in Table 1. The study has shown that the Serum Total Cholesterol, Triglycerides, low density lipoprotein were significantly increased in Psoriasis patients as compared to controls ($P<0.001$). High density lipoprotein levels were decreased in cases than in controls and was not statistically significant ($P = 0.11$).Vitamin C levels were significantly decreased in Psoriasis patients than controls. A P-value of 0.001 was considered to be significant.

TABLE 1: Comparison Of Lipid Profile , Vitamin C Levels In Cases And Controls

S.No.	Parameter	Mean ± SD(mg/dl)		P value
		Cases (n=40)	Controls (n=40)	
1.	Total Cholesterol	212.85± 28.44	180.32 ± 29.93	P<0.001*
2.	Triglycerides	167.15± 44.02	133.4 ± 31.34	P<0.001*
3.	High density lipoprotein	39.62±5.62	41.4±4.29	P<0.11
4.	Low density lipoprotein	139.77 ± 22.45	112.2 ± 28.35	P<0.001*
5.	Vitamin C	0.35 ± 0.15	0.94 ± 0.30	P<0.001*

*** Statistically Significant**

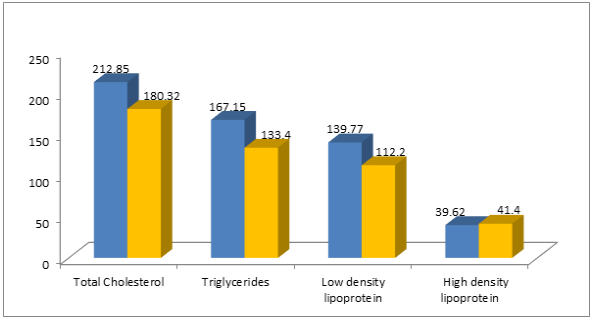

FIGURE - 1: Mean Values Of Lipid Profile In Cases And Controls

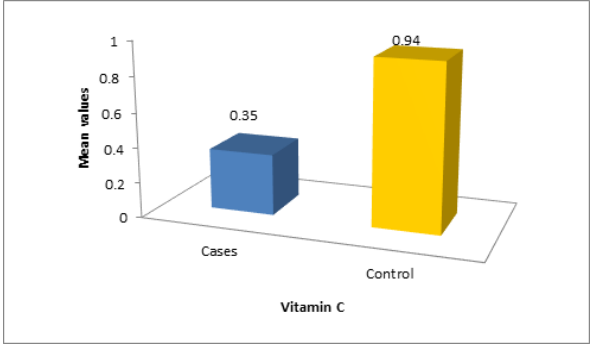

FIGURE - 2: Mean Values Of Vitamin C In Cases And Controls

DISCUSSION

Psoriasis is a chronic inflammatory skin disease characterized by increased T –helper -1 and T-helper-17 cell activity. Psoriasis and atherosclerosis are autoimmune disorders. several genes, cytokines like IL-6,8,1,17, INF-gamma are commonly involved. Dyslipidemia, insulin insulin resistance ,endothelial dysfunction, clotting system activation and pro-oxidative stress common between two conditions. Thus, Psoriasis is a risk factor for hyperlipidemia and occlusive vascular disease(13).

In our study, the total Cholesterol levels were significantly higher in cases as compared to controls with P value <0.001 similar to the studies of Bajaj et al (14), Dsouza PH et al (15), Javidi et al(16). The degree of elevation of total cholesterol is associated with the progression of the disease and useful in estimating the risk of cardiovascular disease.

In our study, the serum triglycerides were significantly increased in cases than controls (P value <0.001) and the results of our study were similar to the other studies (14,16,17).

We observed higher LDL-C levels in Psoriasis patients as compared to controls (P value <0.001). Results of our study were in agreement with the other studies (14, 15,18).

In our study, the HDL-C levels were decreased in cases as compared to controls but was not statistically significant (P value=0.11). Results of our study were in agreement with the other studies (7,16).

Abnormal lipid metabolism may be related to high incidence of atherosclerosis in psoriasis. Hypertriglyceridimia secondary to VLDL elevation is associated with both procoagulant and prothrombotic factors in the blood. VLDL mediated platelet adhesion may play an important role in atherosclerosis. VLDL remnants are susceptible to retention within arterial intima, promoting atherosclerotic plaques growth. Modified HDL particles in atherosclerotic plaques stimulates cholesterol efflux from foam cells, endothelium dependent vasoreactivity and antioxidant activity and also generates a proatherogenic species. Macrophages activated by engulfing LDL immune complexes release large quantities of TNF-α and IL-1β. The lipid abnormalities seen in psoriasis promote atherosclerosis and facilitate and maintain inflammatory reaction in the skin(19,20).

In our study, the Vitamin C levels were significantly decreased in cases as compared to controls (P<0.001) similar to other studies(11,12).

Skin being the interface between the body and environment is chronically exposed to both endogenous and exogenous pro-oxidant agents leading to hamful generation of reactive oxygen species(21). Vitamin C is an important antioxidant protectors of the skin.Increased ROS production is seen in psoriasis and decreased concentration of antioxidants leads to oxidative stress which indicates lipid peroxidation which may lead to cell damage by continuous reactions. The decrease in vitamin c levels is probably to counter act the stress caused by oxidation (4,22).

CONCLUSION

Psoriasis is a chronic inflammatory disease associated with increased risk of cardiovascular disease. Alterations in lipid profile, free radical generation and oxidative stress are implicated in pathogenetic process leading to lipid peroxidation and decreased levels of antioxidants.

Psoriasis patients must be considered as a high risk group for cardiovascular disease as it is associated with abnormalities in lipid profile and early screening and treatment of hyperlipidemia is recommended to prevent atherosclerosis and cardiovascular events. Antioxidant supplementation is suggested to inactivate free radicals and stabilization of cell membranes to prevent new epidermal destruction.

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