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Original Article

Dermatology Section

A Clinical and Epidemiological Study of Psoriasis and its Association with Various Biochemical Parameters in Newly Diagnosed Cases

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ABSTRACT

Background: There has been a lot of recent search on consideration of psoriasis as a systemic disease, with researchers being of the view that dermatological manifestations represent only a part of the spectrum. Although, there have been plenty of studies from the west reporting an association of psoriasis with the metabolic syndrome, there are no large-scale Indian studies evaluating Asian patients. The present study is an endeavour in this regard.

Aim: To investigate the prevalence of metabolic syndrome in Indian patients with newly diagnosed psoriasis at the onset of the disease.

Methods: The study is a prospective clinical case control study, with 100 patients of psoriasis and 100 age-matched healthy controls. 5ml plain venous blood after overnight fasting was obtained by venepuncture. Plasma glucose was tested by glucose oxidase method. Serum cholesterol and triglycerides was estimated by enzymatic method. Metabolic syndrome was diagnosed by the presence of three or more criterion of the National Cholestrol Education Programme's Adult Panel (ATP). The statistical software SAS 9.2 and SPSS 15.0 was used for the analysis of the data.

Results: Metabolic syndrome was diagnosed in 8 out of 100 cases and 9 out of 100 controls (p-value: 0.811). We did not find any association of psoriasis with metabolic syndrome in our study. The age of onset of the disease, the duration of the disease and the severity of the disease activity were also not found to be associated with the likelihood of developing metabolic syndrome.

Conclusion: Our study refuted any association of psoriasis with metabolic syndrome at the onset of disease activity in Indian patients. The plenty of reports from west approving such an association can be explained by increased risk factors like smoking, alcohol consumption, obesity and stress levels. Further, most such studies have been conducted with patients on treatment, while ours is the first study on newly diagnosed patients prior to the initiation of any therapy.

Keywords: Psoriasis, Metabolic Syndrome, Obesity

INTRODUCTION

Psoriasis is a common, chronic, disfiguring, inflammatory and proliferative condition of the skin, in which both genetic and environmental influences have a critical role [1]. Many studies have demonstrated that patients with psoriasis may have an increased risk of non-cutaneous diseases, including arterial and venous occlusive diseases. Changes in the plasma lipid composition may be the reason for increased risk of atherosclerosis in psoriasis [2]. Alterations in plasma lipid and lipoprotein composition including a tendency toward an increase in total cholesterol (TC), triglyceride (TG), low density lipoprotein cholesterol (LDL-C) and decrease in high-density lipoprotein cholesterol (HDL-C) levels suggest that psoriasis may be associated with the disorders of lipid metabolism [3,4]. Evidence suggests that chronic inflammation, a characteristic feature of psoriasis, per se may play a role in the initiation and progress of dyslipidemia and atherosclerosis. Early detection of such abnormalities may result in cut down in the number of cardiovascular accidents in psoriasis patients.

METHODOLOGY

The study comprised 100 cases of psoriasis visiting the inpatient and outpatient Department of Dermatology of Kempegowda Institute of Medical Sciences, Bangalore, India. After obtaining clearance and approval from the institutional ethical committee, 100 patients of newly diagnosed psoriasis in the age-group of 18 to 75 years were taken up for the study, prior to initiation of any form of treatment. Patients with a past history of systemic or topical treatment for psoriasis or patients taking systemic drugs that are likely to interfere with the lipid profile or sugar profile were excluded from the study.

After obtaining written informed consent, the study subjects were subjected to detailed history including demographic data, drug history, personal history and family history. All the patients were graded according to Psoriasis Area Severity Index (PASI) and Body Surface Area (BSA) into 3 categories - Mild, Moderate and Severe. 100 age and sex matched controls were selected from the general group of patients attending the OPD for other minor ailments. A complete lipid profile with fasting and postprandial blood glucose levels were estimated together with measurement of BMI, waist-hip ratio and blood pressure.

Case control statistical analysis was carried out in the present study. Significance was assessed at 5% level of significance. Analysis of variance (ANOVA) was used to find the significance of study parameters between three or more groups of patients, Chi-square/2x3 Fisher Exact test was used to find the significance of study parameters on categorical scale between two or more groups.

RESULTS

Mean age of cases was 42.84 years while mean age of the controls was 44.47 years. Maximum number of patients (28%) of psoriasis belonged to age-group of 41-50 years and the least number of patients being in the 13-20 years and 71-80 years age-group with

prevalence being 3% and 2%, respectively [Table/Fig-1]. According to PASI, 3% had mild psoriasis (PASI <3), 55% of patients had psoriasis of moderate severity (PASI 3-10) whereas, 42% had severe type (PASI >10) [Table/Fig-2].

Fifty one percent of the cases had serum triglycerides below 150mg/dl as compared to 61% of the controls. Thus, no significant difference in serum triglyceride values was seen in cases and controls (p-value: 0.154) [Table/Fig-3]. 77% of the cases had serum HDL within the normal range as compared to 74% of the controls. Thus, no significant difference in HDL values was seen in cases and controls (p-value: 0.622) [Table/Fig-3]. 14% of the cases had blood pressure above 130/85mm Hg while only 15% of the controls had values above 130/85 mm Hg. This was not a significant association (p-value: 0.841) [Table/Fig-3]. 18% of the cases had fasting plasma glucose value above 100mg/dl while only 14% of the controls had values above 100mg/dl. This was not a significant association (p-value: 0.584) [Table/Fig-3]. 17% of the cases had waist circumference greater than 102 cm in males and 88 cm in females while 18% of the controls fulfilled these criterion (p-value: 0.852).

Metabolic syndrome was diagnosed in 8 out of 100 cases and 9 out of 100 controls (p-value: 0.811). We did not find any association of psoriasis with metabolic syndrome in our study. The age of onset of the disease, the duration of the disease and the severity of the disease activity were also not found to be associated with the likelihood of developing metabolic syndrome.

Age in years	Cases		Controls	
	No.	%	No.	%
13-20	3	3.0	3	3.0
21-30	20	20.0	13	13.0
31-40	20	20.0	23	23.0
41-50	28	28.0	28	28.0
51-60	20	20.0	21	21.0
61-70	7	7.0	10	10.0
71-80	2	2.0	2	2.0
Male	72	72.0	67	67.0
Female	28	28.0	33	33.0

[Table/Fig-1]: Age and Sex wise Distribution of Cases and Controls

PASI	Number of patients	%	95% CI
Mild	3	3.0	1.03-8.45
Moderate	55	55.0	45.24-64.39
Severe	42	42.0	32.80-51.79
Total	100	100.0	-

[Table/Fig-2]: Distribution of Cases According to Psoriasis Area Severity Index

Abnormal Lipid profile	Criteria	Cases (n=100)	Controls (n=100)	p-value
Serum Triglycerides	<150 mg/dl	51(51.0%)	61(61.0%)	0.154
	>150 mg/dl	49(49.0%)	39(39.0%)	
HDL (40mg/dl in males, 50mg/dl in females	<40/50 mg/dl	23(23.0%)	26(26.0%)	0.622
	>40/50 mg/dl	77(77.0%)	74(74.0%)	
Blood pressure	(<130/85 mmHg)	86 (86%)	85(85%)	0.841
	(>130/85 mmHg)	14 (14%)	15(15%)	
Fasting Plasma Glucose	(<100mg/dl)	82 (82%)	86 (86%)	0.584
	(>100mg/dl)	18 (18%)	14 (14%)	
Waist circumference (102 cm in females, 88 cm in males)	(< 102 cm or < 88 cm)	83 (83%)	82 (82%)	0.852
	(> 102 cm or > 88 cm)	17 (17%)	18 (18%)	
Metabolic syndrome (3 or more criterion)	Absent	92 (92%)	91 (91%)	0.811
	Present	8 (8%)	9 (9%)	

[Table/Fig-3]: Lipid Profile of Cases and Controls

DISCUSSION

Psoriasis is increasingly being considered as a systemic disease with researchers being of the view that dermatological manifestations represent only a part of the spectrum. It's association with metabolic syndrome is of particular importance. The metabolic syndrome is a combination of diabetes mellitus, hypertension, obesity and hyperlipidaemia. People with the metabolic syndrome are at increased risk of coronary heart disease and other atherosclerotic diseases (e.g., stroke and peripheral vascular disease).

Almost all the studies on the association of metabolic syndrome with psoriasis are from the West and conducted on Westerners. Most of these studies reveal an increased prevalence of metabolic syndrome in patients of psoriasis [5]. There are very few published large-scale Indian studies evaluating Asian patients in this regard. The only published study by Nisa et al., [6] revealed a prevalence of metabolic syndrome in 28% patients of psoriasis as compared to only 6% of controls. However, our study did not find any association between metabolic syndrome and newly diagnosed psoriasis patients at the onset of the disease activity.

We provide the following explanations for our contradictory results. The prevalence of metabolic syndrome in general population varies from 19.52% in India [7] to 34% in the United States [8]. This led us to think that there are additional genetic and metabolic risk factors that contribute to the increased tendency to develop metabolic syndrome in Western population as compared to Indian population.

The prevalence of regular smokers in healthy Indian adults was found to be 15.6% [9], (in our study-14%). In contrast, the prevalence of smoking in a study [10] on healthy US adults was found to be 19.3%. Smoking is an independent risk factor for the development of metabolic syndrome.

The prevalence of obesity in the general population in the US [11] is at a staggering 35.7%. In contrast, in Indian population obesity prevalence [12] is at 6.8%, (in our study-7.7%). Obesity, which is one of the diagnostic criterions of metabolic syndrome, may itself predispose the individual for the development of lipid abnormalities, hypertension and diabetes.

Our study included patients at the onset of their disease activity. Most other studies, including the Indian study, have evaluated patients during the course of their disease. During the course of the disease, several other confounding factors may appear which impact the results.

Our study included patients without any previous history of topical or systemic treatment for psoriasis. Other studies have included patients who are/or have been on treatment for psoriasis. Systemic antipsoriatic treatments are independent risk factors for development of metabolic syndrome.

Psoriasis with its chronic course and repeated remissions and exacerbations leads to significant stress in the patients. The stress levels are significantly less at the onset of disease activity. Most of the studies have not evaluated the role of stress. Stress, in turn, is an independent risk factor for development of metabolic syndrome. Stress levels are least at the onset of the disease activity and gradually, increase with the duration and severity of the disease.

CONCLUSION

We conclude by reiterating that psoriasis, at the onset of disease activity, is not associated with an increased risk of metabolic syndrome. This risk may, however, vary with increase in the duration of the disease and after the effect of various systemic antipsoriatic medications coupled with an increased level of stress. Further studies with large sample size, including patients of different phases of disease and different treatment and their co-relation with metabolic syndrome are needed for a clear picture.

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