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A Case Control Study of Metabolic Syndrome in Psoriasis Vulgaris Patients at Tertiary Care Institute

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Abstract

Background: Psoriasis is a chronic, disfiguring, inflammatory and proliferative condition of skin influenced by both genetic and environmental factors. The prevalence of psoriasis vary from 0.1% to 3% in different population1. The pathogenesis of psoriasis is interplay of various inflammatory cytokines and chemokines which play an important role in the pathogenesis of various other systemic diseases. Psoriasis has been reported to be associated with metabolic syndrome which increases the risk of Coronary Artery Disease. **Aim:** To study the prevalence of metabolic syndrome among patients of psoriasis vulgaris. **Setting and Study Design:** This is a case-control study and was conducted at the out-patient clinic of Department of Dermatology, Venereology and Leprology of a tertiary care centre. **Materials and Methods:** Study was approved by the Institutional ethical committee. The patients were included in two study groups. 50 patients diagnosed with psoriasis vulgaris were included as cases. Fifty age and sex matched controls were included in the control group. The detailed demographic history, duration of disease, family history and personal history was taken. Patients were assessed for severity of psoriasis using PASI score and blood sample collected was analyzed for fasting blood sugar levels and serum lipid profile. The data collected was evaluated using Chi Square test and unpaired t test. **Results:** Total 50 patients were included as cases and controls respectively out of which 11 (22%) were females and 39 (78%) were males. The mean age of cases and controls was 45.85 and 46.04 respectively. The mean duration of psoriasis in cases was 78.86 months. The mean PASI score was the prevalence of Metabolic Syndrome in psoriasis vulgaris was 46% in our study. **Conclusion:** Metabolic syndrome is a significant morbidity which predisposes the patients for Coronary Artery Disease. The patients of psoriasis vulgaris should be routinely screened for hypetension, Type II diabetes mellitus and dyslipidemias.

Keywords: Dyslipidemia, Hypertension, Metabolic Syndrome, PASI Score, Psoriasis vulgaris

1. Introduction

Psoriasis is a chronic, disfiguring, inflammatory and proliferative condition of skin, in which both genetic and environmental influences play a critical role. The occurrence of psoriasis is universal and the prevalence in different populations vary from 0.1% to 3%[1]. The most characteristic lesions consist of red, scaly, sharply demarcated, indurated plaques, present particularly over extensor surfaces and scalp. The disease is very variable in duration, periodicity of flares and extent of involvement.

Psoriasis has been reported to be associated with many other cutaneous and systemic diseases. These include psoriatic arthritis, Crohn's disease, acquired bullous disorders like bullous pemphigoid and vitiligo. Psoriasis is associated with increased risk of developing non-melanoma skin cancer, lymphohematopoietic tumours, and solid tumours, metabolic disorders like gout, hypocalcemia, type II diabetes mellitus, dyslipidemia, hypertension and obesity[2].

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The metabolic syndrome also called syndrome X and insulin resistance syndrome consists of metabolic abnormalities that causes increased risk of cardiovascular disease and diabetes mellitus. The major features of metabolic syndrome include central obesity, hypertriglyceridemia, low HDL cholesterol, hyperglycemia and hypertension[3].

The age adjusted prevalence of the metabolic syndrome is 34% in men and 35% in women[3]. The various risk factors implicated for metabolic syndrome include obesity, sedentary lifestyle, ageing, diabetes mellitus, coronary artery disease and lipodystrophy.

Psoriasis has been shown to share certain common inflammatory mediators with metabolic syndrome. Some studies have shown increased prevalence of metabolic syndrome among patients of psoriasis whereas other have found association of dyslipidemias with psoriasis

Early detection and intervention in case of metabolic syndrome can reduce the risk of cardiovascular disease.

Hence we conducted this study to determine the prevalence of metabolic syndrome in patients with psoriasis vulgaris and to find the association of metabolic syndrome with duration and severity of psoriasis in these cases.

2. Methodology

Approval was taken from Institutional Ethics Committee. The patients were included in two study groups. 50 patients diagnosed with psoriasis vulgaris were included as cases. Fifty age and sex matched controls were included in the control group. Inclusion criteria foe cases was Patients above the age of 18 years; Patients with clinical and histopathological diagnosis of psoriasis and Patients willing to participate in the study. Patients taking systemic retinoids and cyclosporine. Patients attending the OPD for complaints other than psoriasis were included as cases. Whereas Patients with androgenetic alopecia, acanthosis nigricans, skin tags, acne inversa, and other conditions known to be associated with metabolic syndrome; pregnant women; Females taking hormonal oral

Contraceptive pills; Patients not willing to participate in the study were excluded from both study groups.

The detailed demographic history, duration of disease, family history and personal history was taken. Patients were assessed for severity of psoriasis using PASI score. Blood sample from both cases and controls was analysed for fasting blood sugar levels and serum lipid profile. The data collected was evaluated using Chi Square test and unpaired t test.

3. Results

In this study we found the mean age of patients of psoriasis as 45.84±14.95 years. The age-wise distribution of patients with psoriasis shows 12% patients below the age of 30 years, 46% patients in the age group 30-50 years and 42% patients above the age of 50 years.

In this study, the number of male patients with psoriasis is 39 (78%) and females is 11 (22%). The male:female ratio is 3.5:1. The duration of psoriasis was classified into less than 1 year, 1-2 year and more than 2 years. 46% patients had duration more than 2 years, 34% had duration between 1-2 years and 20% had duration less than 1 year. Metabolic syndrome was diagnosed in 9/23, 7/23 and 7/23 cases with duration of psoriasis <1 year, 1-2 years and >2 years respectively.

In this study we found family history of psoriasis to be positive in 15% of the cases. In this study we found the number of smokers to be higher in controls as compared to cases. One out of 23 cases with metabolic syndrome was a smoker and none of the controls with metabolic syndrome had a positive history of smoking. Among the subjects not having metabolic syndrome 6 and 21 subjects were smokers in cases and controls respectively. In the severity distribution of psoriasis we found highest number of smokers with PASI>12 i.e., 6 patients with history of smoking had severe form of psoriasis.

Table 1. Components of metabolic syndrome in two study groups (NCEP-ATPIII)

	Cases	Controls	P value*
Hypertension (>130/85)	23 (46%)	16 (32%)	0.2186
Raised TG (>150mg/dl)	25 (50%)	11 (22%)	0.0068
Reduced HDL (Males <40mg/dl, Females <50mg/dl)	27 (54%)	21 (22%)	0.3169
Raised FBS (>110mg/dl)	8 (16%)	11 (22%)	0.6102
Waist circumference (Male >102 cm, Female >88cm)	11 (22%)	6 (12%)	0.2869

*P value using Chi Square Test.

43.4% cases with metabolic syndrome were aged less than 50 years as compared to none among controls. 56.6% cases with metabolic syndrome were aged above 50 years and all the controls with metabolic syndrome were above the age of 50 years. 47.7% patients with metabolic syndrome are aged above 60 years.

The prevalence of Metabolic Syndrome in psoriasis vulgaris was 46% in our study. We found a statistically significant difference in (Table 2) the prevalence of hypertriglyceridemias between the two study groups.

Table 2. Prevalence of metabolic syndrome in the two study groups

Metabolic syndrome	Case	Control
Yes	23 (46%)	8 (16%)
No	27 (54%)	42 (84%)

P = 0.0025 using Chi Square test Since p value is <0.05, there is significant difference in proportion of patients with metabolic syndrome in both study groups

Table 3. Components of metabolic syndrome and psoriasis severity

	PASI >12 Severe	PASI 8-12 Moderate	PASI <8 Mild
Hypertension (>130/85)	6 (12%)	5 (10%)	12 (24%)
Raised TG (>150mg/dl)	9 (18%)	5 (10%)	36 (72%)
Reduced HDL (Men <40mg/dl, Female <50mg/dl)	11 (22%)	2 (4%)	14 (28%)
Raised FBS (>110mg/dl)	2 (4%)	1 (2%)	5 (10%)
Waist Circumference (Male >102 cm, Female >88cm)	1 (2%)	2 (4%)	6 (12%)

In our study we found 50% psoriatic patients with serum triglycerides more than 150 mg/dl. In this study we found the prevalence of Hypertension among Psoriasis patients to be 46%. The prevalence of reduced serum HDL among psoriatic patients in our study is 54%. Type II Diabetes was found in 16% patients in our study. Central obesity was observed in 22% patients in our study.

4. Discussion

In this study we did not find an increase in prevalence of Metabolic Syndrome with increase in duration of psoriasis.

This observation is in accordance with findings of Madanagobalane et al.,[4] whereas the studies by Nisa et al.,[5] and Belliappa et al.,[6] found a relationship between duration of psoriasis and metabolic syndrome.

The prevalence of Metabolic Syndrome in psoriasis vulgaris was 46% in our study, which is slightly higher than other Indian studies, which have shown a prevalence ranging from 18.2% to 44.1%. Nisa et al., repoted a prevalence of 28% with a very high significance of association in a hospital based study conducted in Jammu[5]. Madanagobalane reported a prevalence of 44% in a hospital based study conducted at Chennai[4]. The overall prevalence of metabolic syndrome in India is 30-40 % with a higher prevalence in certain south Indian states. This prevalence is much higher than studies conducted abroad. Love et al., reported a prevalence of 40% in the survey conducted by National Health and Nutrition Examination Survey (NHANES)[7]. This difference can be attributed to the ethnic variations in the study population as well as the diagnostic criteria used for the diagnosis of metabolic syndrome.

Several possible mechanisms may help explain the association between psoriasis and metabolic syndrome[8]. Chronically elevated levels of Free Fatty Acid (FFA) which leads to adipocyte dysfunction seen in both metabolic syndrome and psoriasis. Shared genetic risk loci among psoriasis and metabolic syndrome may also account for the observed association. For example, CDKAL1 is associated with both psoriasis and type 2 diabetes. The consequences of altered adipokine function in psoriasis also explain the relationship between psoriasis and metabolic syndrome. Adiponectin and leptin dysfunction in psoriasis is described more frequently. Other proinflammatory adipokines, such as resistin and visfatin, were also found to be up-regulated in psoriasis. Combined dysfunction of these adipokines may account for the development of diseases associated with atherosclerosis seen in patients with psoriasis. T-helper inflammatory cytokines are increased in skin and sera of psoriasis patients and these inflammatory cytokines exert systemic effects on insulin regulation and lipid metabolism.

In our study we found 50% psoriatic patients with serum triglycerides more than 150 mg/dl which is slightly higher than that found by Nisa et al[5]. The prevalence of hypertriglyceridemias in psoriatic patients in various Indian studies range from 16%-49%. Love et al., found 44% prevalence of hypertriglyceridemia[7]. Cohen et al., reported prevalence of dyslipidemias among psoriasis patients as 50.9%[9]. Dreiher et al., reported 15.9% patients of psoriasis having hypertriglyceridemias[10].

This association may be due to elevated proinflammatory cytokines i.e., TNF IL-1 or IL-6 in the patients of psoriasis which affect the metabolism of lipids and disturbs the reverse transport of lipids, hence increasing the risk for atherosclerotic plaque formation and cardiovascular risk in these patients compared to the controlled group.

In this study we found the prevalence of Hypertension among Psoriasis patients to be 46% which is consistent with the prevalence found in other Indian studies where this value ranges from 26%-49%. Nisa et al., reported 49% patients of psoriasis with hypertension[5]. Madanagobalane et al., reported this value to be 54%[4]. However we did not find a statistically significant difference between the prevalence of hypertension among the two study groups which is consistent with findings of Madanagobalane et al[4]. This variation in our finding could be due to highly variable prevalence of hypertension across the country and the dietary habits of the local population, higher number of smokers among the control group and higher

proportion of physically active subjects in the study.

In the age wise distribution of cases with hypertension and metabolic syndrome, no patients were aged below 30 years, 15 patients were aged above 30 years whereas in the control group 8 patients were aged above 50 years. Hence we conclude that patients with psoriasis are at risk of developing hypertension even at a younger age group as compared to healthy adults.

The prevalence of reduced serum HDL among psoriatic patients in our study is 54% which is consistent with the findings of other Indian studies. The difference in prevalence among two study groups is not significant in our study which is consistent with the finding of Madanagobalane et al[4].

Type II Diabetes was found in 16% patients in our study which is similar to the findings by Khunger et al[11]. Love et al., reported this finding to be 30.5% using the modified criteria for fasting blood sugar levels[7]. Nisa et al., found the prevalence of diabetes mellitus in psoriasis patients to be 15%[5]. This high variability can be due to different criteria used for diagnosis of raised blood sugar levels, dietary habits and population prevalence of diabetes mellitus.

According to the age-wise distribution of subject with metabolic syndrome and diabetes mellitus, none of the patients were aged below 30 years in both study groups. Hypertensive patients with metabolic syndrome above the age of 50 years were 13 and 5 among cases and controls respectively.

Central obesity was observed in 22% patients in our study. The prevalence found by various Indian Studies is highly variable ranging from 14% to 58%. Nisa et al., found this prevalence to be 14.5%[5] and did not find a significant association between psoriasis and waist circumference. We found similar results. This value was very high i.e., 62.5% in a study conducted by NHANES[7]. This variation could be attributed to the criteria used to define obesity in various studies and the genetic and ethnic variations of the study populations.

5. Summary and Conclusion

In our study we found a statistically significant difference in prevalence of metabolic syndrome between the cases and controls. We did not find the prevalence of metabolic syndrome to increase with increased duration or severity of psoriasis. Thus we conclude that psoriasis is an independent risk factor for development of metabolic syndrome irrespective of its duration and severity.

As the study results suggest that metabolic syndrome is a significant morbidity as it predisposes the patients to an increased risk of cardiovascular disease, the patients of psoriasis vulgaris should be routinely screened for hypertension, Type II diabetes mellitus and dyslipidemias.

The patients should be advised about lifestyle modification and weight loss. The treatment modalities in these patients should be tailored to avoid drug interactions and exacerbation of risk factors.

More studies are needed to determine the mechanisms underlying the association between these two conditions and to learn the effect of psoriasis systemic therapies on metabolic syndrome components.

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