

Research Article

Prevalence of metabolic syndrome in psoriasis vulgaris: a cross sectional study from a tertiary care hospital of South-East Rajasthan

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ABSTRACT

Background: Psoriasis, a common skin disorder is now considered as systemic inflammatory disease. Its chronic inflammatory state is thought to predispose patients to metabolic syndrome (MetS), which is a significant predictor of cardiovascular events. The objective of the study is to investigate the prevalence of metabolic syndrome in psoriatic patients with only cutaneous involvement and to evaluate the correlation between presence of MetS and psoriasis severity

Methods: We performed hospital based, cross-sectional study on 100 adult patients with psoriasis vulgaris and equi-numbered age and sex matched controls. MetS was diagnosed by revised National Cholesterol Education Program's Adult Panel III criteria.

Results: A higher prevalence of metabolic syndrome was found in psoriasis patients as compared to controls [28 (28%) vs 9 (9%), P value=0.0005]. Impaired fasting glucose level, hypertension, hypertriglyceridemia and abdominal obesity were more prevalent in psoriasis group. No statistically significant difference was found between prevalence of low levels of HDL and presence of metabolic syndrome. Presence of metabolic syndrome was not associated with severity and duration of psoriasis. Female patients with psoriasis were more frequently having metabolic syndrome.

Conclusions: Prevalence of metabolic syndrome is higher in patients with psoriasis irrespective of its duration and severity. This stresses on the need of regular evaluation for the presence of MetS or any of its components in psoriasis patients so as to allow early detection and management.

Keywords: Psoriasis, Metabolic syndrome, South-east Rajasthan

INTRODUCTION

Psoriasis is one of the commonly encountered skin disorders affecting approximately 3% of world population.¹ Many authors consider psoriasis as a systemic disease and now it is classified as an immune-mediated inflammatory disease (IMID) of the skin.² The chronic inflammation is thought to be the bridging link between psoriasis and metabolic syndrome which is a strong predictor of cardiovascular disease. Moreover, an

increased mortality from cardiovascular disease in patients with psoriasis has been documented.³

Early detection and management of risk factors can prevent incidence of cardiovascular accidents in patients with psoriasis. Many studies, including a few from India, have documented higher prevalence of MetS in psoriasis. However, there still exists paucity of data on our population as the published Indian studies are mainly confined to the northern and southern parts of country.

We thus aimed to investigate the prevalence of metabolic syndrome in patients with psoriasis vulgaris in our region as well as to assess correlation between severity of disease and presence of metabolic syndrome.

METHODS

It was a hospital based cross-sectional study performed during period of fourteen months (October 2014 to December 2015). The size of the sample was calculated on the basis of prevalence of the disease. The minimum sample size (n) was calculated using the formula $n = z^2pq/L^2$, where $z = 2.58$, $p =$ prevalence (taken as 2.8), $q = 100-p$ ($100-2.8=97.2$), $L =$ allowable error taken as 5%, which came out to be 72. Hence a total of 100 patients with psoriasis vulgaris attending the dermatology outpatient department were taken as the sample size of convenience. One hundred patients concerned with other skin ailments or the apparently healthy relatives of the patients served as controls. Thus the source population for cases as well as controls was same. The inclusion criteria for the cases were age more than 18 years and clinical diagnosis of plaque-type psoriasis of at least six months duration. The diagnosis of psoriasis was made by two separate senior dermatologists and skin biopsy was performed in suspected cases. Patients receiving any systemic treatment for psoriasis for at least one month before enrolment and those with psoriatic arthritis were excluded. Pregnant patients and those on drugs that are likely to interfere with the lipid profile or sugar profile were also excluded from both the groups (cases and controls).

Case record performa was filled after obtaining informed consent from all patients. A detailed history was obtained including duration of the disease, joint pain, smoking, alcohol consumption, presence of other systemic illness, past intake of systemic agents for psoriasis and concomitant intake of medicines for other illnesses.

Patient characteristic such as age, gender, weight, height, body mass index (BMI), waist circumference, blood pressure, smoking habit, alcohol consumption, age of onset of psoriasis, body surface area involved and Psoriasis area severity index (PASI) were recorded.

The waist circumference was measured by placing the measuring tape snugly around the abdomen at the level of the iliac crest. Blood pressure was recorded as the average of two measurements after subjects had been sitting calmly for at least 5 minutes. Venous blood samples were taken from cases as well as controls after the subjects had fasted overnight (at least 8 hours). Serum cholesterol and triglycerides were measured with enzymatic procedures. Plasma glucose was measured using glucose oxidase method.

Our primary definition of the metabolic syndrome was based on the revised criteria from NCEP ATP III.⁴ According to this criteria, participants with 3 or more of

the following were defined as having metabolic syndrome: abdominal obesity (waist circumference >102 cm in men and >88 cm in women); hypertriglyceridemia (triglycerides >150 mg/dL), low levels of high-density lipoprotein cholesterol (<40 mg/dL in men and <50 mg/dL in women); high blood pressure >130/85 mm Hg and high fasting glucose levels >100 mg/dL.

Statistical analysis of the data was done using statistical processing software (SPSS-16). Qualitative variables were compared between the two groups (cases and controls) using Chi-square test. For comparison of means, unpaired t-test was applied. P value of <0.05 was considered statistically significant.

RESULTS

The study included 100 patients and 100 controls. The mean age of patients in years in the psoriasis group was 42.1 ± 14 whereas mean age in the control group was 40.2 ± 12 . Descriptive characteristics of the study population are depicted in Table 1.

Severity of skin involvement in psoriasis group was assessed by the psoriasis area and severity index (PASI score, ranges from 0 to 72, mild 0-3, moderate 3-10, and severe >10).⁵ The duration of the disease was classified as ≤ 5 years, ≤ 10 years and >10 years. Fifty nine (59%) patients had short duration of disease, i.e. upto 5 years, 25 (25%) patients had the duration between 5 and 10 years and 16 (16%) patients had longstanding disease for more than 10 years. PASI score ranged from 1.2 to 41 (median 5.45). 27% patients had mild psoriasis (PASI <3), 42 (42%) had moderate psoriasis (PASI 3-10) and 31 (31.5%) had severe psoriasis (PASI >10). Body surface area affected ranged from 4% to 69% (median 8.5). Amongst 100 cases, 57 [57%] had upto 10% of the body surface area involved patients while 43 [43%] had involvement of >10% of BSA.

Mean body mass index (BMI) was 23.70 ± 3.8 kg/m² and 23.43 ± 3.3 kg/m² in psoriasis patients and control group respectively. No significant difference was found between the two groups with respect to BMI (P value=0.29).

A statistically significant higher prevalence of metabolic syndrome was observed in cases as compared to controls 28 (28%) vs 9 (9%), (p value=0.0005). Four of the total five components of metabolic syndrome including impaired fasting plasma glucose, hypertension, hypertriglyceridemia and abdominal obesity were also more prevalent in cases than in controls. However, no difference was found in the prevalence of decreased high density lipoprotein (HDL) levels. The most common component of the metabolic syndrome among patients with psoriasis was impaired fasting glucose level (43%), followed by hypertension (42%), hypertriglyceridemia (40%), abdominal obesity (24%) and low HDL (16%) in that order.

Table 1: Descriptive characteristic of cases and controls.

Characteristics	Cases (n=100)	Controls (n=100)	Odds ratio	P value
Age in years	42.1 ±14	40.2±12	NA	0.16
Male: Female	75:25	74:26	NA	-
Body mass index (BMI)	23.70±3.8	23.43± 3.3	NA	0.29
Smoker, n (%)	Yes 31(31%)	21(21%)	1.69	0.10
	No 69 (69%)	79 (79%)		
Alcohol consumption [n (%)]	Yes 24 (24%)	17(17%)	1.54	0.22
	No 76 (76%)	83 (83%)		
Metabolic syndrome [n(%)]	Yes 28 (28%)	9 (9%)	3.93	0.0005
	No 72 (72%)	91 (91%)		
Hypertriglyceridemia (TG>150 mg/dl)	Yes 40 (40%)	16 (16%)	3.50	0.000
	No 60 (60%)	84 (84%)		
HDL (<40 mg/dl) (M) or < (50 mg/dl) (F) [n (%)]	Yes 16 (16%)	11(11%)	1.54	0.30
	No 84 (84%)	89 (89%)		
Blood pressure >130/85 mmHg [n (%)]	Yes 42(42%)	21(21%)	2.72	0.01
	No 58 (58%)	79 (79%)		
Fasting plasma glucose>100 mg/dl [n (%)]	Yes 43(43%)	25(25%)	2.26	0.007
	No 57 (57%)	75 (75%)		
Waist > 102cm (M) Or >88 cm (F) [n (%)]	Yes 24(24%)	13(24%)	2.11	0.04
	No 76 (76%)	87 (87%)		

Table 2: Relation between disease severity and metabolic syndrome and its Components.

Metabolic syndrome and its components	PASI ≤ 3 (Mild) n=27	PASI >3 to ≤ 10 (moderate) n=42	PASI >10 (Severe) n=31	P value (Chi square test)
Metabolic syndrome	Yes 8	12	8	0.94
	No 19	30	23	
Increased Waist circumference	Yes 8	10	6	0.65
	No 19	32	25	
Increased BP	Yes 15	15	13	0.26
	No 12	27	18	
Sugar >100	Yes 10	19	14	0.76
	No 17	23	17	
Hypertriglyceridemia	Yes 11	16	13	0.94
	16	26	18	
Decreased HDL	Yes 6	7	3	0.42
	No 21	35	28	

Table 3: Relation between duration of psoriasis and metabolic syndrome.

Metabolic syndrome Presence or absence of metabolic syndrome.	≤ 5 years n=59	≤ 10 years n=25	>10years n=16	P value (Chi square test)
Metabolic syndrome	15	8	5	0.78
No metabolic syndrome	44	17	11	

We observed that prevalence of metabolic syndrome in patients of psoriasis was statistically independent of severity of the disease as given in Table 2. Also, there was no significant association between duration of the disease and presence of MetS (P value = 0.78) as shown

in Table 3. The presence of MetS in psoriasis was significantly associated with female gender (11/25 in females vs. 17/75 in males, P = 0.039 by chi square test). There was no association regarding age (P value= 0.11), history of smoking (P value= 0.19), history of

alcohol (p value= 0.36), mean PASI and PASI >10 (P value= 0.55 and 0.74 respectively), age of onset of psoriasis (P value= 0.22), duration of psoriasis (P value=0.16) , mean body surface area (BSA) involved and BSA involved >10% (P value= 0.36 and 0.98

respectively) in psoriasis patients with metabolic syndrome and patients without metabolic syndrome as tabulated in Table 4. A higher prevalence of metabolic syndrome was found in all age groups among cases than in control subjects as shown in Figure 1.

Table 4: Descriptive features of psoriatic patients with and without metabolic syndrome.

Characteristics	Patients with MS(n=28)	Patients without MS(n=72)	P value
Age in years	45.7±14.3	40.7±13.9	0.11
Gender	Male 17	Male 58	0.039
	Female 11	Female 14	
Age of onset of psoriasis in years±SD	38.3±13.4	34.6±13.5	0.22
Disease duration in years±SD	7.6±7.9	5.7±4.8	0.28
Smokers n(%)	6 (27%)	25 (34.7%)	0.19
Alcoholics n (%)	5 (17.8%)	19 (26.3%)	0.36
PASI>10, n(%)	8 (28.5%)	23 (40%)	0.74
Mean PASI±SD	7.19±5.7	8.1±7.9	0.55
BSA>10%, n(%)	12 (42.8%)	31 (43%)	0.98
Mean BSA involved ±SD	12.3±7.7	14.1±13.7	0.36

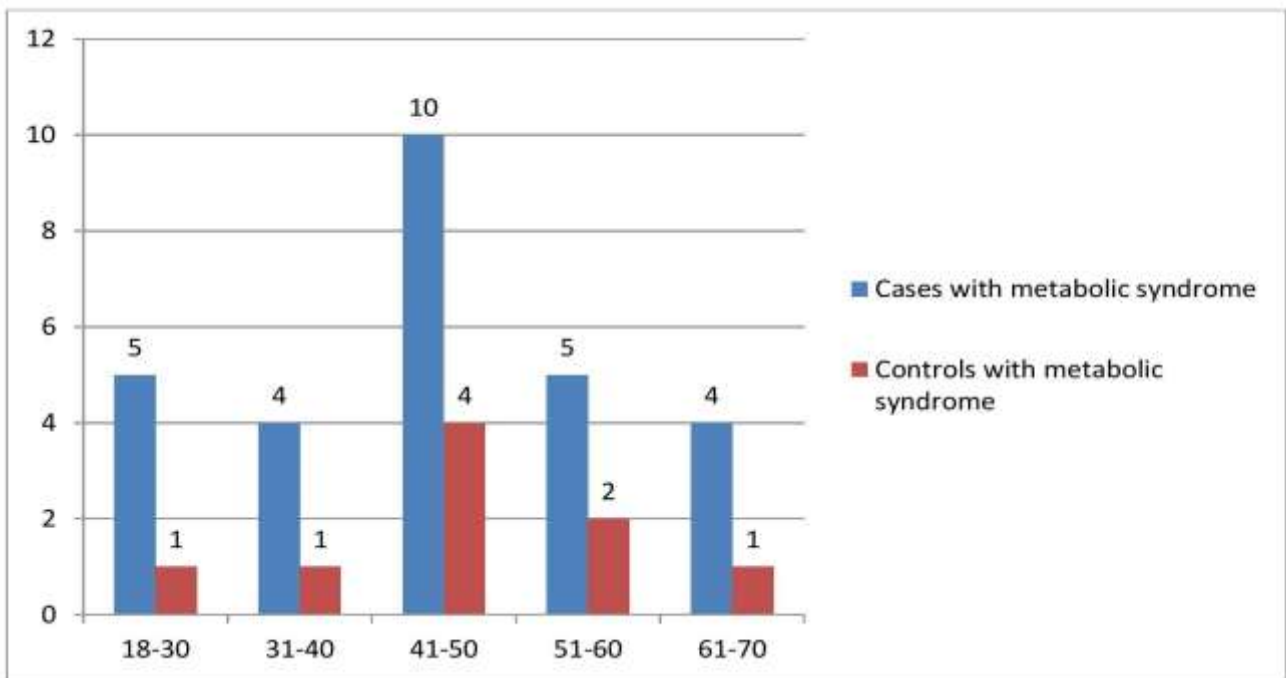


Figure 1: Prevalence of metabolic syndrome among different age groups of cases and controls (x-axis age in years and y-axis no of cases and controls with metabolic syndrome).

DISCUSSION

Metabolic syndrome (MetS) can be aptly described as clustering of risk factors which are accompanied by increased risk of cardiovascular diseases. The chronic inflammation associated with psoriasis accounts for the associated comorbidities. Cytokines like TNF-a, IL-6, intracellular adhesion molecule-1 play a key role in pathogenesis of psoriasis as well as MetS.⁶ In recent past

many studies have been conducted worldwide to evaluate the prevalence of metabolic syndrome in psoriasis.

We found a higher prevalence of metabolic syndrome in psoriasis as compared to controls which supports the observations by Gisondi and other authors.^{7,9} On the contrary, Laxmi et al could not find significant correlation between prevalence of metabolic syndrome in psoriasis patients when compared to controls, although it

was a small scale study (n=40) from south India.¹⁰ A much higher prevalence of metabolic syndrome in psoriasis patients was noted by Madanagobalane and Anandan and Ali et al in south Indian patients, which can be attributed to the use of different criteria for the diagnosis of metabolic syndrome.^{11,12}

Sharma et al documented 58% prevalence of metabolic syndrome in psoriatic arthritis patients.¹³ Such high prevalence was not seen in our study as it aimed at patients with psoriasis vulgaris with cutaneous involvement only and hence those with psoriatic arthritis were not included. These findings suggest a closer association between metabolic syndrome and psoriatic arthritis as compared to cutaneous limited psoriasis vulgaris.

In our study, we found that MetS was more prevalent in female psoriasis patients than male patients ($P = 0.039$). This is in accordance with the study by Lakshmi et al and Zidanci et al but in contrast to study by Gisoni et al in which prevalence of MetS was independent of gender.^{10,14,7} The possible explanation for higher prevalence of metabolic syndrome in females in our study could be that most of the women in our region are housewives having relatively sedentary lifestyle and limited outdoor activities.

Similar to study by Madanagobalane and Anandan, we found impaired fasting glucose level as the most common finding in psoriasis patients with least common being low HDL level.¹¹ Also, the psoriatic patients had a significant higher prevalence of hypertriglyceridemia, arterial hypertension, impaired fasting glucose level and abdominal obesity. Variable results have been found from other Indian studies. Ali et al and Niti et al reported abdominal obesity as the most common finding (38%) and significant correlation between presence of MetS with hypertension and abdominal obesity but surprisingly not with diabetes.^{12,15} However, results of other studies from India are similar to our observation with respect to correlation between MetS and impaired fasting glucose levels.^{8,11} This difference in prevalence of metabolic syndrome and its components may be attributed to ethnic, diverse dietary and lifestyle factors.

There was higher mean age of psoriasis patients with MetS, when compared to patients without MetS, though it was not statistically significant. Similar results were obtained by Laxmi et al, although they found the correlation as statistically significant.¹⁰ Unlike Gisoni et al study which documented the higher prevalence of metabolic syndrome in psoriatic patients than controls after the fourth decade of age, we observed a higher prevalence of metabolic syndrome in all age groups (including age group of 18 to 30 years) in psoriasis patients.⁷

Our study has shown that presence of MetS is independent of the extent of involvement (PASI score

and BSA involved) which supports previous studies^{7,8,11,16} but differs from a Korean study in which MS was found to be significantly more prevalent in patients who had moderate and severe disease.^{7,8,11,16,17} Our study denies any correlation between presence of MetS and duration of psoriasis which supports the study by Zidanci et al whereas, Niza and Quazi found higher mean duration of psoriasis when compared to patients with and without metabolic syndrome.^{8,14}

In India, there is relative paucity of data regarding the prevalence of metabolic syndrome in psoriasis. Previous studies have documented prevalence of metabolic syndrome in psoriasis patients as cases irrespective of the presence or absence of psoriatic arthritis. Our study has the strength of being performed on a different subset of Indian population and also we report our results in patients with pure cutaneous involvement excluding psoriatic arthritis. Furthermore, cases and controls were both age and gender matched.

The limitation of our study is that being a cross-sectional study, it could prove association alone, and not causality. Secondly, the population that served as our study sample is understandably not representative of the entire Indian population and thus there is a scope for further larger multicentric studies in the country.

CONCLUSION

Psoriasis is associated with metabolic syndrome independent of its duration and severity. Psoriasis must be considered as immune mediated inflammatory disease with metabolic syndrome as an associated comorbidity. This approach would give opportunity for early diagnosis and management of the anticipated health hazards, most importantly cardiovascular events. Moreover, psoriasis being a chronic disease, a timely advice about adapting healthy lifestyle including diet and exercise would be an appreciable step towards prevention of this comorbidity. Not only this, it would also help improve the doctor-patient relationship and overall life quality of patients.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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