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Original Research Article

A cross sectional study to investigate the prevalence of metabolic syndrome in clinically diagnosed patients of psoriasis vulgaris in South Gujarat

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ABSTRACT

Background: Psoriasis is a common, chronic, inflammatory keratinization disorder of the skin. It can be triggered by many environmental as well as genetic factors. The metabolic syndrome (syndrome X, insulin resistance syndrome) consists of a constellation of metabolic abnormalities that confer increased risk of cardiovascular disease (CVD) and diabetes mellitus (DM). Often coexistence is noticed between psoriasis and metabolic syndrome.
Methods: A cross-sectional study was conducted in the Government medical college and new civil hospital, Surat. A total of 115 clinically diagnosed cases of psoriasis vulgaris and similar age and sex matched controls visiting dermatology out patients' department of new civil hospital, Surat were selected for the study.
Results: Prevalence of metabolic syndrome is significantly higher in psoriatic patients after the age of 40 years, and it directly correlates to psoriasis duration. No association observed with gender, percentage of body surface area involved and smoking, but in patients of 18-40 years with metabolic syndrome had significantly higher percentage of body surface area involved as compared to >40 years age group.
Patients with metabolic syndrome had mean disease duration of 5.52±5.83 years and BMI was 27.48±4.36.
Conclusions: Higher prevalence of metabolic syndrome in patients with psoriasis could play a relevant role in accelerating atherosclerosis. All patients with psoriasis should be encouraged to aggressively correct their modifiable cardiovascular risk factors.

Keywords: Psoriasis, Metabolic syndrome, Atherosclerosis, Complications, Diabetes.

INTRODUCTION

Psoriasis is a common, chronic, inflammatory keratinization disorder of the skin, in which both genetic and environmental influences are known to play a critical role. It has a worldwide prevalence of 1-3%.[1,2] Prevalence in India varies from 0.44% to 2.8%.[3] Henseler and Christophers demonstrated that the bimodal peak in disease onset could be taken as evidence for the existence of two pathogenetically distinct forms of the disease.[4] Type 1 is hereditary, strongly HLA associated (particularly HLA-Cw6), early onset and more likely to be severe. Type II is sporadic, HLA unrelated, of late onset, usually mild and without any family history.

Psoriasis is known to be associated with various systemic co-morbidities like hypertension, obesity, diabetes mellitus, and arthritis.

The metabolic syndrome (syndrome X, insulin resistance syndrome) consists of a set of metabolic abnormalities that can lead to increased risk of cardiovascular disease. Major risk factors are obesity, sedentary lifestyle, stress,smoking and chronic alcoholism.[5] MS is diagnosed by the presence of three or more of five criteria as proposed by the updated National cholesterol education program Adult Treatment Panel III(ATP III), with Asian modification for waist circumference. The criteria include, central obesity: waist circumference ≥90 cm in men and ≥80 cm in women, hypertriglyceridemia: triglyceride ≥150 mg/dl or on specific medications, low high-density lipoprotein (HDL) cholesterol: <40 mg/dl for men and <50 mg/dl for women, hypertension: blood pressure ≥130 mmHg systolic and ≥85 mmHg diastolic or on specific medications and fasting blood glucose: ≥100 mg/dl or on specific medications or previously diagnosed type 2 diabetes mellitus.[6]

Many studies can be found in Indian as well as western literature pertaining to this topic but the Indian studies had been mainly conducted in South India and Maharashtra.[7] The prevalence of psoriasis as well as metabolic syndrome is known to show great variation as per the ethnic origin of the population, geographical location of study area and the environmental factors, hence we decided to conduct this study in our institute at south Gujarat which has not been reported in the literature previously.

This study was undertaken mainly to explore the recent linking of psoriasis to metabolic diseases and summarize the correlation of metabolic syndrome with the severity and duration of psoriasis vulgaris in urban population of south Gujarat.

Aim of the study

To investigate the prevalence of metabolic syndrome in clinically diagnosed patients of psoriasis vulgaris and to determine the relation between presence of metabolic syndrome and the severity of psoriasis.

METHODS

It was a hospital based cross sectional study wherein 115 psoriatic patients attending the psoriasis clinic in the department of dermatology of new civil hospital, Surat were included in the study. The study was conducted over a period of 1 year from during February 2011 to January 2012 after obtaining the institutional ethics committee approval.

Other inclusion criteria were age more than 18 years, clinical diagnosis of psoriasis for at least 6 months. Patients receiving any systemic treatment in last 1 month (methotrexate, acitretin, cyclosporine, biologics, phototherapy) were excluded from the study. Written informed consent was taken from patients prior to participating in the study. Psoriasis was diagnosed based on clinical and/or histopathological criteria.

The data was collected as per the prepared questionnaire that recorded the age, gender, height, weight, waist circumference, blood pressure, duration of psoriasis, age of onset of psoriasis, and severity of psoriasis.

Body mass index (BMI) was calculated as (weight in kg)/(height in meter).[2] Waist circumference was measured with a measuring tape held horizontally at the top of hipbones coming all the way around the body, level with belly button, making sure that it not too tight and patients were asked not to hold their breath during the procedure. Blood pressure was estimated with a sphygmomanometer in sitting position in right brachial artery. The final value was accepted as the average of two readings taken 5 minutes apart.

Assessment of psoriasis severity was performed by calculating percentage of body surface area (BSA) involved. The body surface area involved was quantified by using the handprint- or palm-method. In this, the patient's palm (the total palmar surface of palm plus five digits be assumed to be approximately equivalent to 1%) was taken as a reference and then how many patient palms fit in the affected area of the head, the arms, trunk and legs was determined, thus helping to calculate the total %BSA involved. Laboratory investigations including serum lipid profile and fasting blood sugar were performed on venous samples taken at the enrolment visit after the subjects had fasted overnight(at least 8 h).

Metabolic syndrome was diagnosed by the presence of three or more of the five criteria of the National cholesterol education programme's ATP III.[6] Statistical analysis were done with Epi info 7.0 software.

RESULTS

A total of 115 patients were included in the study. The descriptive characteristics of study population are as described in Table 1.

In present study 102 (88.7%) cases were married and history of consanguineous marriage was present in 11 (9.6%) patients.

Patients with at least 3 or more NCEP-ATP III criteria positive were considered positive for metabolic syndrome. Total 35 (30.44%) patients had metabolic syndrome. The descriptive characteristics of the patients are as depicted in Table 2. The most commonly prevalent three positive criteria were FBS, blood pressure and waist circumference.

The prevalence of metabolic syndrome was significantly higher in psoriatic patients after the age of 40 years (65.71%). While cases having metabolic syndrome at

younger age (18-40 years) had equal sex distribution as compared to male predominance(65.22%) in >40 years age group but the difference in both group was not statistically significant.

Table 1: Study population, descriptive characteristics of the cases.

Parameter	Cases (n=115)
Sex M:F	2.28:1
Age at enrolment(years), mean±SD	44.5±15.3
Smoker, N (%)	51 (44.34)
Alcoholism, N (%)	78 (67.8)
Body surface area involved, mean±SD	20±0.19
Past history of diabetes mellitus, N (%)	30 (26.08)
Past history of hypertension, N (%)	31 (26.95)
Family history of psoriasis, N (%)	26 (22.60)
Metabolic syndrome, N (%)	35 (30.44)
Waist circumference >102 cm for males/>88 cm for females, N (%)	46 (40.1)
Triglycerides level >1.7 mmol/l, N (%)	41 (36.1)
HDL <1 mmol/l for males <1.3 mmol/l for females, N (%)	45 (39.6)
Blood pressure >135/85 mmhg, N (%)	48 (41.74)
Fasting blood glucose >6.1 mmol/l, N (%)	51 (44.35)

Table 2: Descriptive characteristics of psoriasis patients with metabolic syndrome.

	Patients with metabolic syndrome (n=35)	P value
Age at onset of psoriasis >40 years	23 (65.71%)	0.2
Sex, M:F ratio	M-21, F-14, 3:2	0.4
Duration of psoriasis	5.35±5.83	<0.01
Mean BMI±SD	27.48±4.36	<0.0001
Body surface area involved >20%	14(42%)	0.005
Smoking	15 (43.1%)	0.6
Alcoholism	11 (34.2%)	0.2
Fasting glucose >6.1mmol/l, n(%)	23 (64.1%)	0.01
Waist circumference >102cm for males/, >88cm for females, n(%)	18 (51.4%)	0.005
Triglycerides level >1.7mmol/l, n(%)	18 (51.4%)	0.4
HDL <1mmol/l males <1.3mmol/l females, n(%)	14 (40%)	0.2
Blood pressure >135/85mmhg, n (%)	21 (60%)	<0.05
Presence of psoriatic arthritis, n (%)	4 (11.4%)	0.2

Duration of psoriasis has been found to be statistically significant ($p<0.05$) associated in patient with metabolic syndrome. Patients with metabolic syndrome had mean psoriasis duration of 5.52±5.83 years, more than that of patients without metabolic syndrome, difference noted was statistically significant ($p<0.01$), suggesting that prevalence of metabolic syndrome correlates to disease duration.

Difference in percentage of BSA involved in both age groups was also statistically significant. In patients of 18-40 years with metabolic syndrome had higher percentage of body surface area involved as compared to >40 years age group.

In present study we observed the higher prevalence of individual components of metabolic syndrome, most commonly affected parameter was fasting blood sugar levels raised in 51 (44.35%) of patients. Blood pressure was elevated in 48 (41.74%) cases.

Cases with metabolic syndrome had higher BMI (27.48±4.36) as compared to patients without metabolic syndrome, difference noted was statistically highly significant ($p<0.0001$).

Patients with metabolic syndrome had higher mean age but difference was not statistically significant. No association with gender, percentage of body surface area involved and smoking was observed.

DISCUSSION

Metabolic syndrome was originally described as a group of four conditions namely glucose intolerance, hypertension, dyslipidemia and central obesity, which when coexist in an individual increase the risk of cardiovascular disorders.[8] There have been many studies from various parts of world showing an association between metabolic syndrome and psoriasis. Our present study mainly included population in South Gujarat, majority of which is migrant population from different parts of India.

Possible biologic mechanism between the coexistence of psoriasis and metabolic syndrome could be the chronically elevated free fatty acid (FFA) levels which cause adipocyte dysfunction leading to insulin secretion and up regulation of pro inflammatory adipokines like adiponectin, leptin, resistin and visfatin.[9] Lifestyle factors such as smoking, increased alcohol consumption, sedentary lifestyle and obesity may also contribute to the development of cardiovascular disease and increased inflammation in these patients.[10]

The mean age of presentation with psoriasis was low in present study with more prevalence in male. Similarly the mean age of presentation of psoriasis in Nisa et al was 37.34 years and male to female ratio was 2.48:1 and in Cohen et al mean age was 42.7±20.3 years and

M:F=1.01:1.[4,6] In Gisondi et al mean age was 62.1±15.1 years and M:F=0.9:1.[11] The present study showed a low prevalence of family history (5.2%) in psoriasis patients as compared to other study like Luigi et al.[12] (15.7%), Zhang et al (24.7%) and Al-Mutairi et al (70%).[13,14]

In our study, metabolic syndrome was present in 35 out of 115 patients (30.44%). which is similar to the results of a well-designed, good volume, cross-sectional study by Gisondi et al.[11] having 30.1% prevalence of metabolic syndrome. In Nisa et al.[4] it was 28%. Sommer et al.[15] Also found higher prevalence of metabolic syndrome among hospitalized psoriatic patients as compared to hospitalized melanoma patients but the study instead of ATP III criteria adopts a modified version of the WHO definition of metabolic syndrome. In comparison to studies of Nisa et al.[4] Gisondi et al.[11] and Sommer et al.[15] our study has the drawback of being an uncontrolled study. These differences may be due to the ethnic differences in the study populations throughout the country.

In our study, 44.34% of the study population was smokers however no significant association was found between smoking and the presence of metabolic syndrome in our study. Association with smoking may be partly explained by the action of nicotine which promotes Th1 mediated inflammation.[16,17]

Alcoholism has been related with psoriasis and studies have reported 1.3-1.6 fold increased risk of development of psoriasis in alcoholics.[17] In our study, 67.8% were chronic alcoholics. This higher percentage could be due to increased proportion of migrant population in south Gujarat. However no significant correlation was found between alcoholism and presence of metabolic syndrome.

Socioeconomic factors could have also played a role in lowering the actual prevalence of MS in our study. Most of our cases belonged to lower socioeconomic status which may explain the lower frequency of MS in our study population. MS might have been influenced by occupational activity in our patients which involved moderate to high physical activity (33% of study population). This is supported by a study done by Crist et al.[18] that reported increased aerobic exercise/work could reduce the prevalence of MS.

In present study, metabolic syndrome is significantly higher in psoriatic patients after the age of 40 years (65.71%). Age influences the occurrence of MS in the general population as the individual components of MS are more common in the elderly. Gisondi et al.[11] found MS in psoriasis was more common after 40 years of age. Zindancı et al.[19] found that MS was common in the age group of 40-59 years. Kim et al.[20] found the prevalence of MS in patients older than 53 years age. While cases having metabolic syndrome at younger age (18-40 years) had equal sex distribution as compared to male predominance (65.22%) in >40 years age group but the difference in both group was not statistically significant. Zindancı et al.[18] found increased prevalence of MS in female patients ($p<0.05$). Mebazaa et al[19] found increased prevalence of MS in female patients with psoriasis (47.4%) compared to controls (30.1%), ($p=0.01$). However, Nisa and Qazi[4], Gisondi et al.[11] and Kim et al.[20] found no gender difference in the prevalence of MS, similar to the findings of our study.

In our study, cases with metabolic syndrome had higher BMI (27.48±4.36) as compared to patients without metabolic syndrome, difference noted was statistically highly significant ($p<0.0001$).

Duration of psoriasis has been found to be statistically significant ($p<0.05$) associated in patient with metabolic syndrome. Patients with metabolic syndrome had mean psoriasis duration of 5.52±5.83 years, more than that of patients without metabolic syndrome, difference noted was statistically significant ($p<0.01$), suggesting that prevalence of metabolic syndrome correlates to disease duration.

Current study showed that the higher prevalence of individual components of metabolic syndrome, most commonly affected parameter was fasting blood sugar levels raised in 51 (44.35%) of patients. Blood pressure was elevated in 48 (41.74%) cases. Several studies have demonstrated higher lipid levels in psoriasis. Dreiher et al.[21] found a significant increase in lipid levels among psoriasis patients than in controls ($p<0.001$). Shapiro et al.[22] found that psoriasis was associated hyperlipidemia, but was not associated with an increase in LDL level. Cohen et al.[6] have found that psoriasis is associated with dyslipidemia ($p<0.015$). However, in our study, hyper-lipidemia was not significantly present in patients with metabolic syndrome. This could be due to the dietary habits of our study population.

Amongst the Indian studies, looking at the individual parameters of Kothiwala et al[23], Pereira et al.[24] and Madanagobalane et al [25] had similar findings to our study with respect increased blood sugar levels. However the findings regarding dyslipidemia in the study by Madanagobalane et al.[25] conflicted with our findings. In view of increased prevalence of metabolic syndrome Pereira et al.[24] did not find any correlation between psoriasis and MS. Madangobalene et al.[25] found that MS was associated with psoriasis but there was no correlation with severity. Our findings are in agreement with Kothiwala et al.[23] who stated MS and severity of psoriasis were strongly related.

Limitation of this study was that the sample size was not large enough to represent general population. Further large, controlled, randomized, population based studies should be undertaken to confirm the association and causality between psoriasis and metabolic syndrome.

CONCLUSION

Higher prevalence of metabolic syndrome in patients with psoriasis could play a relevant role in accelerating atherosclerosis. Psoriatic patients have a higher prevalence of metabolic syndrome, which can favour cardiovascular events. Given the serious complications associated with the metabolic syndrome, this frequent comorbidity should be recognized and taken into account in the long-term treatment of individuals with psoriasis. All patients with psoriasis should be encouraged to correct aggressively their modifiable cardiovascular risk factors, in particular, metabolic syndrome. Psoriasis may represent a relevant healthcare issue. Current guidelines of care for psoriasis may require a significant update. On the basis of existing knowledge, new guidelines have been issued aimed at actively identifying metabolic disease and other cardiovascular risk factors in patients with psoriasis so that they may be properly addressed.

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