

Frequency of metabolic syndrome in patients of psoriasis

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Abstract

Objective To find the frequency of metabolic syndrome in patients of psoriasis.

Methods It was an observational study carried out in a tertiary care hospital in Lahore, Pakistan. A total of 100 patients diagnosed as psoriasis both clinically and where needed supplemented by histopathology, were included in the study using non-probability purposive sampling technique. Patients' data including their body mass index (BMI), waist circumference, systolic and diastolic blood pressure (BP), fasting blood sugar (BSF), fasting triglycerides (FTg) and fasting high density lipoproteins (FHDL) were recorded. Patients were categorized as having metabolic syndrome if their waist circumference was >40cm for males and >35cm for females or their BMI was >30kg/m² plus they had any two abnormalities among hypertension, raised fasting plasma triglycerides, reduced HDL and raised fasting blood sugar level.

Results There were 73 males and 27 females. Metabolic syndrome was identified in 41 (30 males and 11 females) patients based on International Diabetes Federation consensus worldwide definition. Females were significantly obese than males ($p=0.00$) and the frequency of females with deranged HDL levels was likewise significantly high as compared to males ($p=0.00$).

Conclusion Metabolic syndrome is a frequent association in psoriasis patients. Females were obese and had had deranged HDL levels.

Key words

Psoriasis, metabolic syndrome.

Introduction

Psoriasis vulgaris is a common, chronic, inflammatory and proliferative disorder of skin, which is characterized by well-demarcated, erythematous, scaly, indurated plaques mostly seen over extensor surfaces and scalp. The disease is enormously variable in duration, extent and periodicity of flare.¹ Both genetic and environmental factors have a critical role in its initiation and aggravation.

Among genetic factors, different gene loci have been identified on various chromosomes and concordance rate for psoriasis is found in 64% of monozygotic twins compared to only 15% of dizygotic twins.²⁻⁴

Environmental risk factors associated with psoriasis include streptococcal pharyngitis, stressful life events, low humidity, drugs, HIV infection, trauma, smoking and obesity.⁴

The pathogenesis of psoriasis includes epidermal hyperproliferation, dilatation and proliferation of dermal blood vessels and accumulation of inflammatory cells, most important of which are helper T (Th) cells. These cells are recruited in response to various cytokines and they further

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release cytokines and growth factors leading to keratinocyte proliferation and resultant inflammation. Other inflammatory cell populations include antigen presenting cells, Langerhan cells, macrophages and natural killer cells. The proposed pathogenic cytokines include tumor necrosis factor-alpha (TNF- α), interferon-gamma (INF- γ), granulocyte monocyte-colony stimulating factor (GM-CSF), interleukin (IL) -1, 2, 6, 8, 12, 17, 23, vascular endothelial growth factor (VEGF) and endothelin.⁵

There are various comorbidities associated with psoriasis, both dermatological and nondermatological. A very important and recently recognized disease association is metabolic syndrome which is a combination of medical disorders like diabetes mellitus, hypertension, obesity and dyslipidaemias.⁶

The pathogenic mechanisms and cytokine profile of psoriasis and metabolic syndrome reveal many similarities, establishing both as inflammatory disorders with a potential role of T helper cells.

Obesity is a key component of metabolic syndrome and is regarded as the basic initiative of inflammatory cascade leading to adverse outcomes like dyslipidemias, hypertension and increased cardiovascular mortality in the long run. The adipocytes secrete TNF- α , interleukin-6, leptin, resistin, and plasminogen activator inhibitor-1. All have been associated with hyperinsulinemia, hyperglycemia, insulin resistance, diabetes and endothelial dysfunction.^{7,8}

Psoriasis is also characterized by overexpression of TNF- α and therapies aimed at antagonizing the effects of TNF- α have good results in psoriasis and other inflammatory conditions e.g. rheumatoid arthritis and Crohn's disease.⁸

A direct correlation between severity of psoriasis and the prevalence of obesity, dyslipidemia and hyperhomocysteinemia has been reported in psoriatic patients, suggesting that skin changes, caused by psoriasis, have a direct role in determining these risk factors.⁹ Other studies also reveal high prevalence of metabolic syndrome in psoriatic patients.⁶

It is suggested that increased oxidative and inflammatory stress may contribute to the greater risk of coronary heart disease and cerebrovascular disease in obese adults with metabolic syndrome.¹⁰⁻¹³

As the two conditions are related pathogenically and frequently found together, early screening of psoriatic patients for metabolic syndrome can lead the dermatologist for referral to a physician. It can help in prevention and management of cardiovascular and other complications associated with metabolic syndrome.

The aim of this study was to determine the frequency of metabolic syndrome in psoriatic patients in our population.

Methods

This observational study was carried out in both outpatient, as well as, inpatient departments of dermatology, Mayo Hospital, Lahore from August 2010 to February 2011. Patients were enrolled by non-probability purposive sampling. Detailed history and examination were undertaken and patients were diagnosed clinically as psoriasis if they had been suffering from erythematous plaques with adherent silvery scales and positive Auspitz sign and where in doubt histopathology examination was carried out to exclude other similar dermatological conditions. The purpose and procedure of the study were explained to every patient in easily understandable language and those who

consented to be enrolled were included. All enrolled patients had disease duration of more than 6 months. However pregnant and lactating women were excluded. Patients who were addicted to any sort of drugs and suffering from major organ diseases like diabetes, hypertension, chronic liver and kidney disease, hyperlipidemias and cardiac issues were also excluded. Patients on any kind of drugs that could interfere with their natural insulin surges and glycemic controls were also excluded.

Demographic data (age and gender) and other variables were noted on a specially designed proforma. Subjects were assessed for the five components conditions of metabolic syndrome. Blood pressure was measured by using a standard sphygmomanometer after the subject had been seated for at least 5 minutes. The mean value of two measurements taken at least one minute apart was used in the analysis. Fifth-phase Korotkoff sound was used for diastolic blood pressure. Abdominal obesity based on waist circumference was measured at the narrowest point between umbilicus and bottom of ribcage with a measuring tape by the same observer.

Fasting blood samples (14 hour fasting) were drawn for glucose and lipid profile. Metabolic syndrome was defined by the presence of central obesity and any two derangements out of the following: fasting blood sugar, serum triglycerides, high-density lipoprotein cholesterol and blood pressure.

The data were analyzed in Statistical Package for Social Sciences version 11.0 for Windows. Quantitative variables like age, BMI, blood pressure, fasting blood sugar, serum triglycerides, high-density lipoprotein cholesterol were presented as mean. Qualitative variables like gender was presented as frequency and percentages.

Results

There were 73 males and 27 females with male to female ratio 2.7:1. Mean age of the patients was 51.20 ± 10.91 years. 10 patients were in the age range of 25-34 years, 13 patients in the age range of 35-44 years, 30 patients in age range of 45-54 years, 37 in the range 55-64 years and 10 patients were found in age range of 65-74 years. Maximum number (37%) of patients was found in the age range of 55-64 years (**Figure 1**). Mean age of male patients was 51.42 ± 11.65 years and that of female patients was 50.59 ± 8.77 years.

Of 100 patients, metabolic syndrome was identified in 41 patients i.e. 41% of study population (**Table 1**). The frequency in males was 41% (30 out of 73) and in females, 40% (11 out of 27).

Fifty-six patients (31 males and 25 females) had elevated waist circumference values. So, females were significantly obese than males ($p=0.00$). A total of 40 patients were found to have BMI $>30\text{kg/m}^2$. Frequency of various components of metabolic syndrome among study population is shown in **Table 2**. Systolic hypertension was detected in 17 (13 males and 4 females) patients, yet the difference was insignificant ($p=0.125$). Diastolic hypertension was seen in 14 males and 4 females (total=18) with insignificant sex difference. Elevated blood sugar levels were found in 33 (24 males and 9 females) patients but sex difference was insignificant. Deranged fasting triglyceride levels were detected in 19 patients (14 males, 5 females). 18 males and 14 females (total=32) had deranged HDL levels. Hence, the frequency of females with deranged HDL levels was significantly high as compared to males ($p=0.00$).

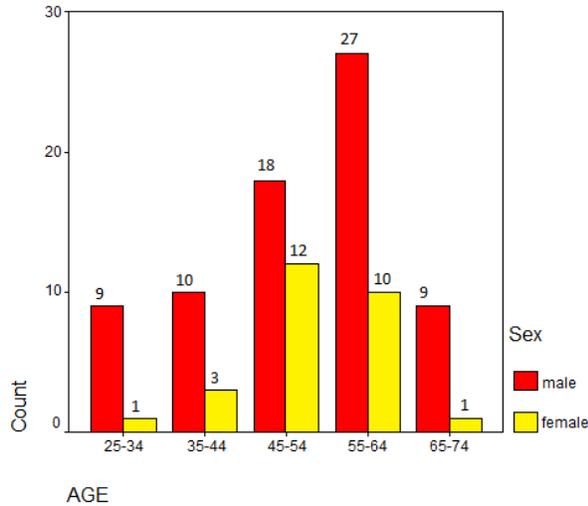


Figure 1 Analysis of patients according to age and gender.

Table 1 Frequency of metabolic syndrome.

	Metabolic syndrome	
	Present	Absent
Male	30 (41%)	43 (59%)
Female	11 (40.7%)	16 (59.3%)
Total	41 (41%)	59 (59%)

Table 2 Distribution of variables (n=100).

Variables	Males	Females
Gender	73 (73%)	27 (27%)
Mean age (years)	51±11.65	50±8.77
Fasting blood sugar (mg/dl)	98±21.41	101±25.68
Systolic blood pressure (mm/Hg)	123±12.03	122±12.88
Diastolic blood pressure (mm/Hg)	80±7.74	80±7.46
Triglycerides (mg/dl)	134±29.82	143.35±24.43
HDL (mg/dl)	43±6.64	49±6.68
Weight (Kg)	69±8.8	66.6±8.5

HDL: High-density lipoprotein.

Discussion

The role of chronic inflammation causing metabolic and vascular disorders is increasingly recognized.¹³ It is said that proinflammatory cytokines contribute to atherogenesis, peripheral insulin resistance and the development of hypertension and type II diabetes mellitus.^{7,8} Psoriasis is a chronic inflammatory skin disease and is characterized by a variety of immunological and inflammatory changes which, therefore, can predispose to these disorders.

The patients presenting to us did not represent a specific area of population or class, however, majority belonged to middle or lower socioeconomic status. We investigated a total of 100 patients with chronic plaque psoriasis and determined the frequency of metabolic syndrome and its individual components.

The frequency of metabolic syndrome in general population has been assessed by many studies.¹³⁻¹⁶ Unfortunately, not much data have been published on the frequency or prevalence of metabolic syndrome in Pakistani population. The Chennai Urban Rural Epidemiology Study (CURES) from India, investigated 26001 individuals for the prevalence of metabolic syndrome in general population according to WHO, ATP III and IDF consensus criteria. They found a prevalence of 23.2%, 18.3% and 25.8%, respectively.¹⁶

Previous reports in literature have positively elucidated a relationship between psoriasis and metabolic syndrome.¹⁴⁻¹⁸ We compared our study results with other internationally published data.

In one study done by Dorothea *et al.*¹⁸ in Germany, the prevalence of metabolic syndrome was found to be 4.3% in hospital-based cases as compared to 1.1% in controls, clearly, a twofold increased rate in psoriatic patients. It was found to start at mid age and persist throughout further life. This was similar to our study results in which maximum number of patients suffering from metabolic syndrome were noted in 45-54 year age group. Considering weight, hyperlipidemia and diabetes mellitus no apparent differences were noted among male and female patients with psoriasis. However in our study, females had deranged fasting HDL levels significantly more than males. Regarding obesity, females of similar age were significantly more obese than males while in our study 39% males and 40% females were obese

i.e. almost same ratio. The high rates of obesity in German psoriatic females could be due to affluent life style with higher consumption of junk food items.

We also compared our study results with a study done by Gisondi *et al.* in Italy.¹⁷ They studied a total of 338 cases and 334 controls. Mean age of cases was 62.1 year and mean BMI of 27.7 kg/m². Prevalence of metabolic syndrome was found to be 30.1% in cases versus 20.6% in controls. The higher frequency of metabolic syndrome seen in our study population may be due to following factors; firstly, the mean age of our study population was much lower i.e. 51±10 years and higher frequency of psoriasis is observed at almost mid age in our study i.e. 45-54 years age group. Secondly, mean BMI of our study patients was 28.5 kg/m² i.e. patients had higher rates of obesity and were prone to various comorbidities that constitute metabolic syndrome. There was no difference in frequency of metabolic syndrome between males and females, the same was observed in our study.

A US National Health and nutrition Examination Survey (NHANES) 2003-2006, conducted by Love *et al.*⁶ was carried out on 6549 participants. Mean age of the patients was 39 years. Prevalence of metabolic syndrome was 40% in psoriatic population versus 23% in controls. These results were similar to what we had in our study. However, they found a higher number of women suffering from metabolic syndrome than men. Comparing the prevalence of individual components in psoriatic population, high BSL levels were seen in 30%, hypertension in 28%, raised fasting triglyceridemia in 44% and decreased fasting HDL in 33%. These frequencies were almost similar to our study results.

Nisa and Qazi conducted a hospital-based case control study in Srinagar, Jammu and Kashmir,

India, with 150 cases and 150 controls.²⁰ Mean age was 37 years and mean BMI was 28kg/m². Prevalence of psoriasis was 28% among cases versus 6% among controls whereas in our study, 41% patients were found to have metabolic syndrome. Percentage of individual components of metabolic syndrome was as follows; deranged FTg 48%, HDL 56%, BSF 18%, and hypertension 49%. In this study, derangements of lipid profile and hypertension were detected in a higher percentage of psoriatic patients as compared to our study (48% vs. 19% and 49% vs. 35%) while deranged fasting BSL was seen less prevalent among the cases than in our study (18% vs. 33%). Hence, diabetes was seen more in our study patients and hypertension and abnormal lipid profile among the Indians. The difference in results may be due to difference in mean BMI which was 23 kg/m² in Indian study and 28 kg/m² in ours, as obesity has a direct relationship to diabetes mellitus. The other factors may be food, life style and genetic variations of people belonging to two regions.

Unfortunately no such study, estimating the prevalence of metabolic syndrome, has yet been carried out in Pakistan.

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