The prevalence of metabolic syndrome in patient with psoriasis

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Abstract

Introduction: Psoriasis is a chronic relapsing remitting skin disease with T cell mediated inflammatory response. The presence of increased no of proinflammatory cytokines leads to increase the risk of development of metabolic disease and CVD in patient with psoriasis.

Aim: To find the prevalence of metabolic syndrome in patient with psoriasis

Methods: This study was a prospective hospital based case control study including 194 cases of psoriasis and 194 healthy matched controls. Waist circumference was obtained. Serum Triglycerides and cholesterol were measured using standard procedure. Venous samples were collected from the patients after overnight fasting (at least 8 h). Blood pressure was then recorded. Patient was labelled with metabolic syndrome when three of the five mentioned parameters were abnormal according to the criteria of the SAM National Cholesterol Education Program's Adult Treatment Panel III (ATP-III).

Results: There were 117 males (60%) and 77 females (39.7%) in study group while 127 males (65.5%) and 67 females (34.5) in control group. Metabolic Syndrome was present in 42.8% of cases compared (23.2%) of controls with a p value <0.05. fasting blood sugar level was significantly higher among those with MS (46.9% compared to 24.2% in control group)

Conclusion: The increased frequency of metabolic syndrome in patient with psoriasis led to a great burden not only on the health but also to the treating physician. All psoriasis patients must be screened for metabolic syndrome at the very onset of disease to decrease the comorbidities associated with psoriasis.

Keywords: Triglycerides, Metabolic syndrome, Psoriasis.

Introduction

Psoriasis is a chronic T cell mediated inflammatory disease of skin which at time affects the joints. The worldwide prevalence of Psoriasis is 2-3%.[1] The estimated prevalence in India is 0.44% to 2.8%.[2, 3] Males and females are equally affected.[1] Psoriasis presents as an indurated plaque which has a characteristic salmon pink colour with overlying adherent silvery white scales presents mainly over the extensors and scalp.[4] Psoriasis is a multifactorial disease with environmental, genetic, and immunologic factors appear to play a role in its pathogenesis.[5,6] Dysregulated innate immunity play an important role in development of plaques of psoriasis. Historically, Th1-type response had a suggested role in disease pathogenesis. However, Th17 subset of T cell recently been established to play a key role in the primary pathogenesis. Evidence includes genetic association, with IL-23 being a key cytokine in generation of Th17 cells.[7, 8]

Metabolic syndrome is a constellation of risk factors which include central obesity, atherogenic dyslipidemia (increased triglycerides and decreased HDL), hypertension and glucose intolerance. If in a person three out of five factors are present, it raises the risk of cardiovascular diseases higher than the individual components and individual is said to be suffering from metabolic syndrome.[1, 9]

A few studies across the world have recently shown that psoriasis is associated with Metabolic Syndrome and CVDs. In addition to the elevated cytokines such as tumor necrosis factor-α (TNF-α) and interleukin-6 (IL-6) level in plaques, the levels of cytokines are also elevated in the blood of a psoriatic patient which are proposed to be the cause of this association.[10] So far, there are very few studies done on the risk factors and associated comorbidities in psoriatic patients in India.[11,12]

Methods

This was a hospital based comparative study, which was conducted at the Department of Dermatology, JNMC, AMU, Aligarh from September 2014 to September 2016. During this study period, all the psoriasis patients attending the Dermatology Outpatient Department were enrolled in the study after obtaining an informed consent. The patients were diagnosed clinically and with positive Auspitz sign. Skin biopsy was performed, when required.

Inclusion criteria for cases was patients with more than18 years of age and with psoriasis of more than 6 months of duration. Patients with age less than18 years of age, those on retinoids or cyclosporine therapy with in the past 6 months or with features of diabetes mellitus/dyslipidemia before the onset of psoriasis were excluded from the study.

An exact number of controls (age and sex matched) attending the dermatology OPD were taken and matched with the case group to make the two groups comparable. Ethics committee clearance was obtained from the institutional ethical committee.

After allocation of the groups, detailed data such as age, sex, occupation, age at the onset of psoriasis, percentage body surface area (BSA) of involvement, psoriasis area severity index (PASI), association and distribution of psoriatic arthropathy, if present and concomitant medications were recorded in a proforma. Chronic plaque psoriasis was considered localized or generalised when it covers less or more than 10% of the BSA respectively. Extent of disease activity is determined by Psoriasis Area and Severity Index (PASI) score that evaluates the erythema, induration, and scaling of the lesions in four body areas (head, trunk, arms and legs) and ranges from 0-72. Blood pressure was than recorded twicely with a rest of 5 minutes from the right arm with the patient being sitted, the average of two values was than recorded. Serum triglycerides and cholesterol were measured using standard enzymatic procedure. Venous samples were collected from the patients after overnight fasting for measuring fasting blood sugar. Measuring tape was placed around the abdomen at the level of iliac crest and waist circumference was obtained. Metabolic syndrome was diagnosed if three or more parameters are present according to the criteria of the SAM National Cholesterol Education Program's Adult Treatment Panel III (ATP-III) abdominal obesity (definition of abdominal obesity was modified using Asia Pacific WHO guidelines as waist circumference ≥90 cm for males and ≥80 cm for females), fasting blood glucose ≥100 mg/dl, hypertriglyceridemia >150 mg/dl, or low HDL cholesterol (<40 mg/dl for males and <50 mg/dl for females), blood pressure >130/85 mmHg. [13-15]

Results

A total of 194 clinically diagnosed cases of psoriasis attending the Out Patient Department of Dermatology, Venereology & Leprosy, J. N. Medical College, Aligarh during the period from September 2014 to September 2016 were included in the study group. The same number of age and sex matched controls were selected for other group.

There were 117 males (60%) and 77 females (39.7%) in diseased group while 127 males (65.5%) and 67 females (34.5) in control group. Study showed a bimodal age of onset of psoriatic patients. (Graph 1) The mean age in the case group was 32.33 (21.65) and in the control group was 32.33 (21.27). The age group (40-50yr) constituted more than 36% of the total patients. The mean age of onset of the disease was 32.41 (11.07). The mean PASI of study group was 9.577 (7.54). Most of the patients i.e. 68% have PASI <10. (Table 3) The mean duration of disease <5 years was present in 39% of psoriatic patients, 32% of patients had duration of disease 5-10 years and 27% had duration of disease >10 years (Graph 2) Metabolic Syndrome was present in 42.8% of psoriatic patients compared to (23.2%) of controls with a p value <0.05 as per SAM NCEP ATP III criteria. (Graph 3)

There were 122 (62.8%) patients who had PASI <10.i.e. mild-moderate disease and 72 (37.2%) had PASI >10 i.e. severe Psoriasis. A total of 83 psoriatic patients had metabolic syndrome in our study and 63 out of which had PASI <10 and majority of patients had metabolic syndrome at the very onset or with in first few years of onset of disease which suggests that metabolic syndrome has no correlation with the duration and the severity of psoriasis. (Table 4)

Table 1: Descriptive characteristics of cases and controls

Characteristics	Cases	Control
Male/ Female ratio	1.5:1	1.8:1
Age range in years (mean)	32.33 (21.65)	32.33 (21.27)
BMI (mean + SD)	24.78 (3.77)	23.52 (3.14)
Smokers (%)	24	16
Alcoholics (%)	33	21

Table 2: The distribution of clinical and laboratory findings in cases and controls

Clinical and lab findings	Cases	Control	P value
Sys HTN (>130mm Hg)	44	26	.456
Dia HTN (>80mm of Hg)	40	21	.467
Abdominal circumference	71	31	.001
FBS (>110 mmm Hg)	91	47	.0001
TGs (>150mg/dl)	60	40	.0006
HDL (mg/dl) <40-M, <50-F	90	30	.000
Metabolic Syndrome	83	45	.0001

Table 3: Psoriasis Area Severity Index

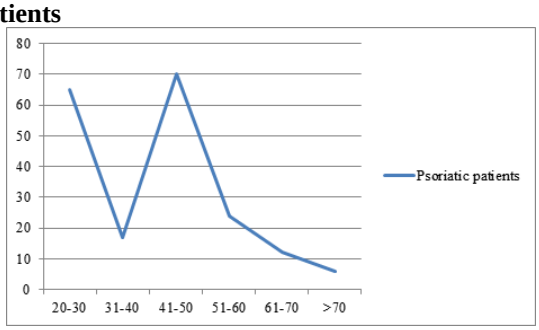
PASI	Psoriatic patients	
	No	%
<10	122	62.8
>10	72	37.2
Total	194	100
Mean SD=9.57(7.54)		

Table 4: Relationship of risk factors with PASI in cases

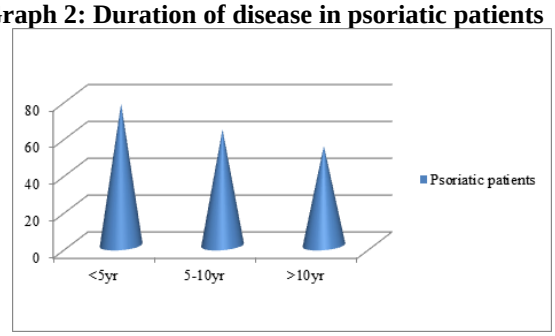
Risk factors in Cases	PASI<10	PASI>10	*P* value
Systolic Hypertension	30	14	.0007
Diastolic Hypertension	31	9	.0001
Increased AC*	53	18	.0013
Increased Fasting BS**	59	32	.00001
Hpertriglyceridemia	32	28	.4730
Increased HDL***	59	31	.0001
Metabolic Syndrome	63	20	.00001

AC*= Abdominal circumference BS**= Blood sugar, HDL***= High density lipoprotein

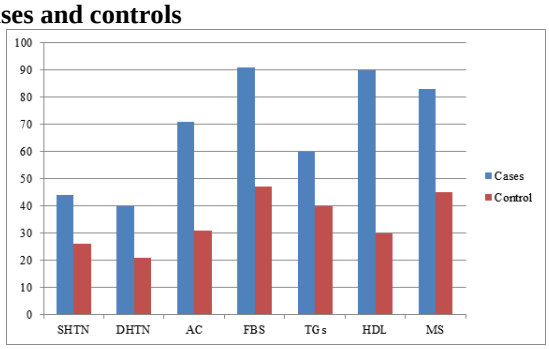
Graph 1: Bimodal age distribution of psoriasis patients



Graph 2: Duration of disease in psoriatic patients



Graph 3: Metabolic Syndrome and its parameters in cases and controls



Discussion

In 2006, Mallbris et al[16] was the one who first discussed the metabolic disorders in patients with psoriasis and psoriatic arthritis. Followed which, Sommer et al[27] also showed the association of MS in psoriatic patients. Since then, there have been many studies from various parts of the world showing the same findings.[1,17]

In our study MS was significantly more common in male psoriatic patients. However, Gisondi et al.[1], Nisa et al.[12] and Kim et al.[18] found no gender difference in the prevalence of MS.

This study represents patients of the age ranging from 20 to 75 years. Age group (40-50 y) constituted more than 36% of the total patients. The mean age of the patients was 32.33 ± 21.7. This observation was consistent with 33.6 years, the mean age reported by Kaur et al (1997).[19] Puri N et al (2013)[20] in a study evaluating different modalities in psoriasis also found the mean age of their patients to be 38.46 ± 3.29.

In our study, half of the patients had a disease onset between 10 to 30 years, while 26% patients had the onset of disease after 40 years. These findings of a bimodal age distribution are similar to earlier studies where two peaks of onset were identified in 16-25 years and 46-55 years age groups.[21, 22] Similarly, an Indian study by Sharma T and Sepaha GN et al[23] reported the highest incidence in the age group of 15-45 years. Gopal M G et al (2013)[24] similarly found that 28% of the patients were of the age group 40-50 years in their study of 100 patients in Banglore.

Our study also observed a higher prevalence of metabolic syndrome in cases (42.8%) compared to controls (23.2%) with a p value <0.05 as per SAM NCEP ATP III criteria. Several studies also found that MS is associated with psoriasis. Zindancı et al.[25] study 115 plaque type psoriatic patients and 140 healthy individuals found a higher prevalence of MS in cases (53%) compared to controls (39%), (P < 0.001 using International Diabetes Federation criteria). Nisa et al.[12] studied 150 patients with the chronic plaque psoriasis and 150 healthy individuals and found the prevalence of MS as 28% in cases and 6% in controls, (P < 0.05). Gisondi et al.[1] studied 338 patients with chronic plaque psoriasis and 334 controls, he found statistically significant higher prevalence of MS in psoriatic patients compared with the controls using National Cholesterol Education Program (NCEP) ATP III criteria (30.1% in cases and 20.6% in controls, P = 0.005). Similarly, Madanagobalane et al.[26] studied 118 adult psoriatic patients and 120 healthy controls and found that MS was significantly more common in psoriatic patients than in controls (44.1% vs. 30%, P value = 0.025). Compared to, Zindancı et al.[25], Nisa et al.[12] and Gisondi et al.[1] our study showed even

more higher prevalence of metabolic syndrome in cases which is similar to observations of Madanagobalane et al[26] one of the probable reason is due to racial factors and the use of South Asian modified NCEP ATP III criteria.

We didn't find any significantly increased BMI in our psoriatic patients though overall in both groups higher BMI levels were more frequent in our females psoriatic patients with metabolic syndrome, similar results are shown by Sommer et al.[27] We believe that this frequency is due to females have less height and are more prone to central obesity in India.

In our study, 122 patients had PASI <10 i.e. 62% and 72 patients had PASI >10 i.e. 37% of cases. Association of MS was independent of PASI and BSA involvement of psoriasis. Similar results were observed in studies performed by Nisa et al.[12] and Gisondi et al.[1] They found that the association of MS was independent of PASI score and BSA involvement. Zindancı et al.[25] and Mebazaa et al.[28] also found that the prevalence of MS was independent of the severity (PASI score). Kim et al.[18] Choi et al[29] however, found a relation between degree of severity of psoriasis and the prevalence of the components of metabolic syndrome. There studies showed the highest prevalence in the moderate severity followed by the mild severity and the least in the severe psoriasis.

Our study found that MS was significantly more common in male psoriatic patients. However, Gisondi et al.[1], Nisa et al.[12] and Kim et al.[18] found no gender difference in their study. In our study this could be due to the socioeconomic background and gender discrimination which led to less health awareness and availability of medical care to females

Niemann et al[30] found higher rates of diabetes mellitus, hypertension, hyperlipidaemia, obesity and smoking in patients with psoriasis than in controls. On analyzing the individual components of MS among psoriasis patients in our study, we found that fasting blood sugar level was significantly higher among those with MS (46.9% compared to 24.2% in control group). We also found significantly higher prevalence of other components of MS such as obesity, hypertension and dyslipidemia among psoriasis patients with MS. The possible explanation is that psoriasis and diabetes share common genetic loci. CDKALI gene has been associated with both psoriasis and type 2 diabetes mellitus. Similarly, PTPN22 has been associated with many diseases, including psoriasis and type 1 diabetes mellitus.[31, 32]

Several studies have demonstrated higher lipid levels in psoriasis. Dreiher et al[33] found a significant increase in lipid levels among psoriasis patients than in controls ($P < 0.001$). Shapiro et al[34, 35] found that psoriasis was associated with hyperlipidemia, but was not associated with an increase in LDL level. Cohen et al[36] found that psoriasis was associated with dyslipidemia ($P < 0.015$). The increased blood sugar and dyslipidemia were the most important factors contributing to increased prevalence of MS in psoriatic group in our study. Sommer et al[27] also reported that there is a significant association between psoriasis and type 2 DM, hypertension, hyperlipidemia. The risk of coronary artery disease and metabolic syndrome is increased by two folds in psoriatic patient in a study he conducted in 581 patients. Gisondi et al[1] found increased prevalence of hypertriglyceridemia and metabolic syndrome in psoriatic patients compared to controls, but they did not find any difference between psoriasis patients and controls with respect to low level of HDL, DM, Hypertension.

SHTN- Systolic Hypertension; DHTN-Diastolic Hypertension; AC- Abdominal Circumference; FBS-Fasting blood sugar; TGs- Triglycerides; HDL- High density lipoprotein

Conclusion- The increased frequency of metabolic syndrome in patient with psoriasis led to a great burden not only on the health of patients but also on the managing dermatologists. Dermatologist should keep an eye for risk factors of Metabolic Syndrome in psoriatic patients. Concerns should extend to it while managing psoriatic patients. All psoriasis patients must be screened for cardio-vascular risk factors as per the proposed guidelines at the disease onset irrespective of the disease severity.

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