ORIGINAL ARTICLE

A Study on the Association of Psoriasis with Metabolic Disorders

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Abstract

Background: Psoriasis is a chronic inflammatory and hyper-proliferative skin disorder which is chronically relapsing with high morbidity and impaired quality of life, characterized by erythematous scaly patches affecting skin, joints and nails. It is a disorder of immune

system involving genetic, immunologic and environtmental factors. Metabolic syndrome (also known as metabolic syndrome X) is a grouping of interrelated medical traits that, when present, indicate an increased risk of developing noninsulin-dependent diabetes mellitus and/or cardiovascular disease.

Aims and Objectives : An attempt to find out the association between psoriasis and metabolic disorders by measuring height, weight, body mass index, hip circumference,waist circumference and its ratio, blood pressure and severity of psoriasis patients by PASI (Baseline psoriasis and severity index) score. Further, to investigate each and every patient with complete blood count, fasting and post-prandial blood glucose levels, thyroid profile,lipid profile.

Materials: It is a hospital based Case-control study conducted at Department of Dermatology, Venereology and Leprology at Dr.D.Y. Patil Hopsital Nerul, Navi Mumbai for a duration of October 2015 –October 2016 with sample size of 100 patients of Psoriasis along with 100 patients of controls. Informed consent was taken from patients to satisfy the inclusion criteria with patients clinically diagnosed as psoriasis, above 18 years and those who participated in the study not having psoriasis as the controls with no exclusion criteria. An information sheet was given to all the participating patients.

Methods: Ethical committee approval, informed Consent were taken from the patients. Severity of psoriasis by PASI score (Baseline psoriasis and severity index) along with height, weight, waist circumference: hip circumference, body mass index were measured. Investigations carried out in all patients were CBC, FBS, PLBS, Thyroid profile, Lipid profile and results were statistically analyzed at the end of study. RESULTS: Out of 200 patients, The observation was in accordance of psoriasis being associated with metabolic syndrome in 71% cases as compared to 37% controls.

Conclusion: The blood pressure, sr. triglycerides, sr. high density lipids, fasting blood sugar were significant in cases as compared to controls satisfying the criteria of Adult Panel Treatment III (ATP III) of Metabolic Disorders.

Introduction

Psoriasis is a chronic inflammatory and hyper-proliferative skin disorder which is chronically relapsing disease with high morbidity and impaired quality of life. It is characterized by erythematous scaly patches affecting skin, joints and nails. Psoriasis is a disorder of immune system. Genetic, immunologic and environmental factors are implicated in the etio-pathogenesis of psoriasis. The term 'Psora' was first used by Galen. Robert willan in 1809 gave an accurate description of psoriasis and Hebra in 1841 distinguished features of psoriasis and leprosy. Psoriasis is identified as a marker of Metabolic syndrome with multiple co-morbid associations like cardiovascular diseases and Diabetis mellitus.

Metabolic syndrome (also known as metabolic syndrome X) is a grouping of interrelated medical traits that, when present, indicate an increased risk of developing noninsulin-dependent diabetes mellitus and/or cardiovascular disease. Many variations of the concept of metabolic syndrome have existed since the 1950s, and while there are a myriad of definitions that exist today, the most commonly used are the American Heart Association/National Heart, Lung and Blood Institute's 2005 update of The National Cholesterol Education Program Adult Treatment Panel III (ATP III) definition and the International Diabetes Federation (IDF) criteria. The ATP III identified six components of the metabolic syndrome; abdominal obesity (measured by waist circumference), atherogenic dyslipidemia [demonstrated by high triglycerides and low high-density lipoprotein"good" cholesterol (HDL-C) cholesterol concentrations], elevated blood pressure, insulin resistance, a pro-inflammatory state (commonly manifested as an elevated C-reactive protein), and a pro-thrombotic state (characterized by elevated plasma-plasminogen activator inhibitor and fibrinogen). Many epidemiologic studies with varied designs link psoriasis to systemic metabolic comorbidities such as obesity, hyperlipidemia, cardiovascular disease, and diabetes..

Methods

It is a hospital based case-control study conducted at Department of Dermatology, Venereology and Leprosy, D.Y. Patil Hopsital Nerul, Navi Mumbai for a duration of October 2015 – October 2016. A sample size of 100 patients of Psoriasis along with 100 patients of controls were taken for

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this study. Informed consent was taken from patients who satisfy the inclusion criteria. An information sheet was given to all the participating patients. with inclusion criteria of all patients clinically diagnosed as Psoriasis, those who participated in the study not having psoriasis as the controls and age above 18 years with no exclusion criteria.

Methods

Ethical committee approval was taken. Informed consent from the patients was taken. Severity of psoriasis by PASI score (Baseline psoriasis and severity index) were measured, simultaneously height, weight, waist circumference: hip circumference, body mass index were measured. Few investigations like CBC, FBS, PLBS, thyroid profile, lipid profile were carried out both in cases and control patients and results were statistically analyzed by the end of the study.

Results

The mean age of patients enrolled in study for cases were 41.92 and that of controls 37.95 (p=0.012), sex ratio showing preponderance of male in cases being 66% and that of controls being 48%. That of females had shown cases of 34% and that of controls is 52%, together showing 'p' value of 0.010. The mean was calculated, it showed 8.71±4.99 in overall 100% of psoriasis patients (p=0.499). Body mass index (kg/m2) in psoriasis patients has shown 26% falling under normal range, 70% are overweight and 45% under obesity and that of controls had shown 32% normal, 64% overweight and 4% obese with overall (p= 0.641).Waist circumference (cm) shows 66 within low range,1 moderate and 33 high range as compared to controls 48 being low, 7 moderate and 45 high range with overall (p = 0.010). The prevalence was higher in female as compared to male. Average tot. cholesterol and sr. triglycerides in cases were 205.8mg/dl, sr.trigly-138.3 mg/dl and those in controls were 214.6 mg/dl, and 145.0mg/dl, with (P = 0.01 and 0.04), respectively. HDL and LDL levels in cases were 36.78 mg/dl, 138.6 mg/dl and those in controls were 40.5 mg/dl and 142.83 mg/dl with (P = 0.01 and 0.119). Cases showed LDL/HDL – 3.83mg/dl, T. CHOL/HDL – 5.59 mg/dl and that with controls had 3.58 mg/dl and 5.36 mg/dl with (P = 0.011). Fasting blood sugar in cases and controls were 103.9 mg/dL, 95.5 mg/dl while those of PLBS were 125.1 mg/dL and 124.6 mg/dl with (P = 0.01 and 0.864). The observation was in accordance of psoriasis being associated with metabolic syndrome in 71% of cases as compared to 37% controls.

Discussion

The present cross sectional study was conducted in Dr. D.Y. Patil hospital with the purpose of correlating the association of psoriasis with metabolic syndrome. In this study 100 cases of suspected psoriasis patients attending skin OPD over a period of 2 years from October 2015 to October 2016 were enrolled. As shown in Table 1 the mean age of patients enrolled in study for cases were 41.92 and that of controls 37.95 giving a 'p' value of 0.012, showing significance over the age. The sex ratio showing preponderance of male in cases being 66% and that of controls being 48%. That of females had shown cases of 34% and that of controls is 52%, together showing 'p' value of 0.010. The distribution of cases were not similar to those of controls. It was observed that patients with psoriasis have a higher smoking and alcohol consumption. It is more triggered by drinking, 30-32% population of psoriasis patients showed consumption of alcohol along with smoking and 'p' value of <0.001. Kremers et al. noted that patients with psoriasis have a higher of smoking and alcohol consumption.[2] Psoriasis is exaggerated by drinking habit.[3] The amount of alcohol consumption may be related to higher incidence and severity of psoriasis. There was seasonal variation seen in the patients with psoriasis for winter. The lesions had increased in number after exposure to cold. There was 66% of psoriatic showing seasonal variation as compared to controls and 'p' value of <0.001. Stress was one of the predisposing factor which was commonly encountered in patients having psoriasis. In this study, 77% of psoriasis patients had shown exposure to stress with 'p' value <0.001.

Psoriasis area severity index was measured on basis of erythema, scaling and induration with 'p' value 0.499. The parameters considered to prove psoriasis and its associations with metabolic syndrome, we had asked patients to undergo blood investigations like CBC, FBS, PLBS, Lipid Profile, TSH and body measurements such as Weight, Height, BMI, waist : hip ratio were taken to rule out the same. Body mass index (kg/m^2) in psoriasis patients has shown 26% falling under normal range, 70% are overweight and 45% under obesity and that of controls had shown 32% falling in normal, 64% are overweight and 4% are obese with overall 'p' value 0.641. On comparing the body mass index, psoriatic patients were significantly more obese (14% vs. 1%) ($p < 0.05$). We found that metabolic syndrome was more common in psoriatic cases than in controls and the differences were statistically highly significant (p= 0.005). The findings were in accordance with previous reports.[6-9] The proportion of the psoriatic cases with metabolic syndrome (37%), was much higher in our study when compared with previous studies reported in the Caucasian population. This gross difference is probably due to racial factors and the use of South Asian modified NCEP ATP III (National Cholesterol Education Programme Adult Treatment Panel) criteria.[6] Similarly,Waist circumference (cm) was measured showing 66 patients with low range,[1] moderate and 33 high as compared to controls showing 48 low,[7] moderate and 45 high range with overall 'p'value of 0.010. Average In cases and controls overall the total Cholesterol and Sr. triglycerides were 205.8 mg/dl, 138.3 mg/dl,214.6 mg/dl and 145.0 mg/dl with 'p' value of 0.01 and 0.04 respectively followed by sr.HDL and sr.LDL showed 36.78 mg/dl, 138.6 mg/dl and those in controls were 40.5 mg/dl, 142.83 mg/dl with 'p' value of 0.01 and 0.119. Fasting blood sugar were 103.9 mg/dl and 95.5 mg/dl with 'p' value of 0.01.The most common feature of the metabolic syndrome among patients with psoriasis was abdominal obesity, followed by hypertriglyceridemia and low levels of HDL cholesterol.[3] The prevalence was higher in female as compared to male.The proportion of patients with metabolic syndrome was more in cases over the age of 25 than in controls (18% vs. 0%), which was comparable to Indian studies.[6,9] Reduced HDL levels (58%) was the most common feature of metabolic syndrome, followed by central obesity (45%), hypertension

Table 1: Demographic details of patients presented to OPD

Characteristics	Cases	Controls	P
Demographic details			
Age (mean)	41.92	37.95	.012
Male	66	48	.010
Female	34	52	.010
Alcohol	30	3	<.001
Smoking	32	4	<.001
Seasonal (winter)	66	0	<.001
Joint pain	27	0	<.001
Atopy	31	13	.002
Drugs	3	33	<.001
Stress	71	37	<.001
PASI			
Mild (<10)			
Moderate (10-14)	8.71±4.99	0	499
Severe (>14)			
Body mass index, (kg/m2)			
Normal <25	26	32	
Overweight 25-30	70	64	
Obese >30	4	4	.641
Waist circumference (cm)			
Low	66	48	
Mod	1	7	
High	33	45	.010
SBP (mm Hg)	126.18	119.71	.010
DBP (mm Hg	81.18	77.42	.008
S. triglycerides (mg/dL)	138.32	145.07	.046
Serum HDL (mg/dL)	36.78	40.50	.010
FBG (mg/dL)	103.98	95.51	.011

(39%), raised triglyceride levels (33%), and diabetes (23%). In this study, smokers and alcoholics were more among the cases than the controls (P = 0.007), similar to various other studies.[5,6,8] Sterry et al. found that obese patients were more likely to have severe psoriasis (i.e.>20% BSA). Intrabdominal obesity was directly linked to psoriasis.[4] Women with psoriasis showed 63% increased risk of future diabetes compared with women without psoriasis.[2] The observation was in accordance of psoriasis being associated with metabolic syndrome in 71% of cases as compared to controls.

Department of Dermatology, Kasturba Medical College, Mangalore, Manipal University, Manipal, Karnataka, India conducted a case-control study in subjects above 18 years of age to study the association between psoriasis and metabolic syndrome, and to assess correlation between severity of disease and presence of metabolic syndrome.

The mean (± standard deviation) duration of psoriasis amongst the cases was 7.5 years ± 8.3 years. The duration ranged from 6 months to 40 years. Amongst the cases, 47% of the patients had PASI <10 and 53% of the patients had PASI > 10. Hypertriglyceridemia (59% vs. 31%), (P = 0.01), abdominal obesity (45% vs. 39%) (P > 0.05) and hypertension (39% vs. 34%) (P > 0.05) were more common in cases, whereas diabetes mellitus (23% vs. 29%) (P > 0.05) was more common among the controls. Diabetes mellitus was the only component of metabolic syndrome which was more common among the controls.

This observation was in accordance with the study by Gisondi et al., but it was in contrast with the studies by Madanagobalane and Anandan,[6] Choi et al.,[5] and Ahmed et al.,[7] The mean age was higher in psoriasis patients with metabolic syndrome than in those without metabolic syndrome, which was comparable to the study by Gisondi et al.,[8] and Ahmed et al.[7] However, in contrast to these reports, the cases with metabolic syndrome did not have earlier disease onset. The severity of disease was more in cases with metabolic syndrome than in those without metabolic syndrome, though it was not statistically significant. This was comparable to the study conducted by Choi et al.,[5] (97.1% vs 77.2%), However, Nisa and Qazi[9] reported that PASI >10 was more common in patients without metabolic syndrome than in patients with metabolic syndrome (P > 0.05).

Various studies conducted in India and abroad have proved the increased prevalence of metabolic syndrome among psoriatic patients. In this study, the association is not limited to severe disease and is independent of the duration of disease and can present from the late second decade. This emphasizes the need for regular evaluation of psoriatic patients, even younger patients and those with mild disease, for the presence of any of the components of metabolic syndrome. There is a paucity of studies from India on the prevalence of metabolic syndrome in psoriasis patients. Nisa and Qazi reported an increased prevalence of metabolic syndrome in patients with psoriasis (28%) as compared to controls (6%) with an odds ratio of 6.09.[9] The high odds ratio in their study may be attributable to the high psoriasis area and severity index (PASI) scores (mean, 15.2 ± 13.9 and median, 13.05) of their patients, comparable to the scores of the patients with severe psoriasis in the present study (odds ratio of 7.2 for developing metabolic syndrome).

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