International Journal of Research in Medical Sciences
Bhat B et al. Int J Res Med Sci. 2016 Nov;4(11):4974-4978
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: http://dx.doi.org/10.18203/2320-6012.ijrms20163801

Original Research Article

A hospital based study to assess the prevalence of cardiovascular risk factors among patients of chronic plaque psoriasis

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Received: 08 September 2016
Accepted: 04 October 2016

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ABSTRACT

Background: Psoriasis is a chronic systemic inflammatory disease associated with several cardiometabolic co morbidities such as obesity, insulin resistance, dyslipidemia and hypertension, and with clinically significant increased risk of cardiovascular disease and cardiovascular mortality.
Methods: The study group included 110 patients with chronic plaque psoriasis and an equally sized age and sex matched control group. Cardiovascular disease (CVD) risk factors studied included hypertension, diabetes mellitus, obesity, dyslipidemia, smoking, heavy alcohol use and family history of CVD.
Results: Psoriatic patients had a significantly higher prevalence of alcohol use (p=0.014), current smokers (p= 0.023), impaired fasting glucose (p=0.032), central obesity based on waist circumference (p=0.008), central obesity based on waist hip ratio (p=0.020) and dyslipidemia (p=0.000).
Conclusions: Psoriasis patients have a unfavourable cardiovascular risk profile. Therefore these patients should undergo screening and treatment of various modifiable risk factors to reduce morbidity and mortality.

Keywords: Cardiovascular risk factors, Metabolic syndrome, Psoriasis

INTRODUCTION

Psoriasis is a hereditary, chronic immune mediated inflammatory skin disorder of unknown etiology, affecting approximately 1-3% of the population worldwide, characterised by scaly erythematous plaques on body surfaces.[1] The pathophysiology is characterized by increase in antigen presentation, T cell activation and T-cell type 1 cytokines.[2]

The chronic inflammatory nature of psoriasis is also thought to predispose patients to other diseases with an inflammatory component, the most notable being cardiovascular and metabolic disorders.[3.] Increased mortality from cardiovascular disease in patients with severe psoriasis has been documented and psoriasis may be an independent risk factor for myocardial infarction, especially in young patients.[4] Several factors may contribute to an unfavourable cardiovascular risk profile such as cigarette smoking, alcohol consumption, obesity, physical inactivity, stress and depression all of which are more prevalent in patients of psoriasis.[4,5] The present case control study was conducted to study the prevalence of cardiovascular risk factors in patients of chronic plaque psoriasis.

METHODS

This was a hospital based case control study which was conducted from November 2013 to October 2014 in the Department of Dermatology of SMGS Hospital, Government Medical College, Jammu, Jammu and Kashmir, India. Patients aged more than 18 years with chronic plaque psoriasis for more than six months were

compared with an age and sex matched control group comprising of patients with skin diseases other than psoriasis.

The patients with guttate/ pustular psoriasis, those receiving or who have received cyclosporine, acitretin, psoralens and methotrexate within last 1 month, pregnant women and patients with thyroid disease, nephrotic syndrome, cholestasis and chronic renal failure were excluded from the study.

The study was approved by Institutional Ethics Commitee and consent was taken from all patients. A detailed history was taken regarding the age, sex, occupation, age of onset and duration of disease, joint pains, family history of cardiovascular disease, personal habits like smoking, alcohol intake and tobacco consumption. Severity of psoriasis was assessed according to the Psoriasis Area and Severity Index (PASI) and percent body surface area (%BSA). PASI was graded as mild (0.1-9.9), moderate (10-20.9), severe (>21). Nail and joint involvement was noted.

Biometric data such as weight, height, waist and hip circumference was taken. To determine waist circumference, a measuring tape was placed at the level of the umbilicus and at the widest part of the hip for hip circumference. Body mass index or BMI (Quetelet's Index) was calculated as weight in kilograms/(height)^2 in metres. Waist to hip ratio was calculated. Blood pressure was recorded and all subjects were investigated for fasting plasma glucose and lipid levels.

The definitions of the risk factors used are:

Current smoker

An adult who has smoked 100 cigarettes in his/her lifetime and who currently smokes every day or some days

Tobacco use

Consumption of any form of tobacco other than smoked in the past 6 months

Family history of cardiovascular disease *(H/O CVD)*

History of cardiovascular event in immediate family members (i.e. in parents and siblings)

Heavy alcohol drinker

For men, consuming an average of more than 2 standard drinks per day and more than 1 standard drink per day for women. One standard drink is equivalent to consuming one standard bottle or 285ml of regular beer, one medium sized glass or 120 ml of wine or single measure or 30 ml of spirits.[6]

Hypertension (HTN)

According to JNC 7th Report

Systolic blood pressure (SBP) ≥140 and/or diastolic blood pressure (DBP) ≥90 mmHg.[7]

Type 2 Diabetes mellitus (DM)

According to American diabetes association

Diagnosed by fasting plasma glucose of ≥126 mg/dl
Impaired fasting glucose (IFG) = 100-125 mg/dl.[8]

Dyslipidemia

According to NCEP ATP III guidelines

Hypercholesteremia - Total serum cholesterol ≥200mg/dl.
Hypertriglyceridemia - Fasting serum triglyceride levels ≥150mg/dl
Decreased HDL - Fasting serum HDL cholesterol <40mg/dl for males and <50 mg/dl for females.
Increased LDL -Fasting serum LDL cholesterol l ≥130 mg/dl.
Increased VLDL-Fasting serum VLDL ≥30mg/dl.
Increased LDL/HDL ratio >3.

Overweight and obesity

Normal BMI- 18.5-22.9
Overweight is BMI between 23-24.9
Obesity is BMI ≥25

Central obesity (CO)

Waist circumference (WC) >80cm for women and >90cm for men.[9]

(ii)Waist hip ratio (WHR) of >0.9 for men and >0.8 for women. [10]

The data was analyzed with the help of SPSS software and p value less than 0.05 was considered significant.

RESULTS

A total of 110 patients of chronic plaque psoriasis and equal number of age and sex matched controls were studied .The mean age of cases was 40.66±12.44 (range 18-75) years and mean age of controls was 40.29±12.35 (range 18-74) years.

A male: female ratio of 2.33:1 was observed in both groups. The duration of disease ranged from a minimum of 6 months to maximum of 23 years. Maximum number of cases were having duration of disease ranging from 1-5years (38.18%) followed by <1 year (36.36%).

59 (53.63%) patients had mild psoriasis, 39 (35.45%) had moderate psoriasis and 12 (10.90%) had severe psoriasis. Nail changes were seen in 44 (40%) patients and 8 (7.3%) had psoriatic arthritis. Table1 shows mean values of various studied parameters of the study population. The prevalence of smoking, alcohol use, central obesity, impaired fasting glucose and dyslipidemia was significantly higher in psoriasis patients than controls (p< 0.05).

Table 1: Mean values of various studied parameters.

Variable (Mean)	Cases	Controls
Weight (kg)	66.70±10.70	65.2±8.56
Height (cm)	164.68±7.14	165.02±5.49
BMI (kg/m2)	24.60±3.59	23.93±2.71
Waist Hip ratio	0.92±0.06	0.88±0.05
Fasting blood sugar (mg/dl)	95.78±18.36	89.76±19.67
D.B.P (mmHg)	82.76±8.02	81.40±7.62
S.B.P (mmHg)	125.56±13.79	123.41±14.74

Table 2: The distribution of CVD risk factors of cases and controls.

Risk factor	Cases	Controls	p value
Current smokers	46 (41.82%	30 (27.27%)	0.023*
Tobacco users	11 (10%)	13 (11.82%)	0.665
Alcohol use	31 (28.1%)	16 (14.5%)	0.014*
H/O CVD	9 (8.18%)	11 (10%)	0.641
C.O (WC)	36 (32.73%)	19 (17.27%)	0.008*
C.O (WHR)	53 (48.18%)	36 (32.7%)	0.020*
Overweight	19 (17.2%)	21 (19%)	0.727
Obese	41 (37.2%)	29 (26.36%)	0.082
IFG	30 (27.27%)	17 (15.45%)	0.032*
Diabetes mellitus	14 (12.73%)	13 (11.82%)	0.837
Hypertension	37 (33.64%)	33 (30.00%)	0.563
Dyslipidemia	69 (62.7%)	43 (39.1%)	0.000*

*p <0.05 = significant

The two groups didn't differ significantly with respect to tobacco use, family history, diabetes, hypertension, obese and overweight patients according to BMI. The distribution of different cardiovascular risk factors is shown in Table 2. Statistically significant decreased levels of HDL, along with increased level of LDL, TG, cholesterol and LDL/HDL ratio was observed in cases than controls.

No significant difference was found in VLDL levels in patients as compared to controls (Table 3). Dyslipidemia was present in 69 (62.7%) psoriasis patients. Among dyslipidemia, hypertriglyceridemia was present in 54 (49%) patients followed by hypercholesteremia in 37 (33.63%) patients. Decreased HDL was observed in 27 (24.5%) patients, raised LDL in 19 (17.2%), raised VLDL in 14 (12.7%) and raised LDL/HDL ratio in 16 (14.5%) patients.

Table 3: Distribution of lipid profiles of cases and controls.

Lipid profile	Cases	Controls	p value
↓HDL	27 (24.54)	15 (13.63)	0.039*
↑ LDL	19 (17.27)	7 (6.36)	0.012*
↑VLDL	14 (12.72)	16 (14.54)	0.694
↑TG	54 (49.09)	27 (24.54)	0.000*
↑Cholesterol	37 (33.63)	21 (19.09)	0.014*
LDL/HDL Ratio>3	16 (14.54)	6 (5.45)	0.024*

*p <0.05 = significant

DISCUSSION

Recent advances in our understanding of the role of inflammatory cells and mediators in the pathogenesis of psoriasis have shifted the clinical perspectives on psoriasis from merely a skin disorder to that of a systemic inflammatory process which has a direct bearing on the prevalence of other co-morbid conditions in patient population.[11] Given the link between atherosclerosis and inflammation, the risk of cardiovascular disease is likely to be increased are prevalent among those afflicted by psoriasis.[12]

In the current study the association between psoriasis and cardiovascular risk factors was studied. A statistically significant association was found between current smoking and chronic plaque psoriasis. Similar results have been found in previous studies. Kremers et al had explained the association of smoking with psoriasis partly by action of nicotine in promoting Th1 mediated inflammation.[13]

Among the other lifestyle factors related to CVD risk heavy alcohol use was also more prevalent in the psoriasis group. In a study of Chinese psoriasis patients by Zhang et al male psoriasis patients were found to use alcohol and tobacco more frequently than controls (p< 0.000001).[14] Malhotra et al also observed more number of psoriatics to be alcoholics than controls in their study.[15]

The prevalence of hypertension and diabetes in cases was higher but not found to be significantly associated with chronic plaque psoriasis. One of the factors contributing to the correlation between psoriasis and hypertension may be the increased amount of endothelin -1, a very potent vasoconstrictor, in both the sera and lesional skin of psoriatic patients.[16]

According to Ghiasi et al psoriatic patients are at 2.2 times risk for developing hypertension than non-psoriatic patients.[17] Nisa and Qazi found raised fasting plasma

glucose in 18% of cases and 5.3% in controls (p=0.0006).[18] The reason why we didn't find a significant association could be because of less sample size of patients taken in present study.

We also observed increased BMI in psoriasis patients versus control group. Central obesity was significantly more common in cases. Obesity is an established risk factor for cardiovascular disease and studies have shown that, compared with the general population, patients with psoriasis are more frequently overweight(BMI ≥25 and <30) or obese (BMI>30).[19]

In present study dyslipidemia was present in 62.7% of cases as compared to 39.1% in controls. The differences were highly significant. Proinflammatory cytokines like TNF-α and IL-6 which are overexpressed in psoriasis are known to contribute to dyslipedemia.[20]

Compared to the control subjects, patients are more likely to have abnormal lipid metabolism. Studies have demonstrated significantly higher levels of S.cholesterol, S.triglyerides and LDL in psoriasis as compared to control population. These patients also have significantly lower levels of HDL than controls. [21]

CONCLUSION

Aggressive cardiovascular risk factor screening should be undertaken in all psoriatic patients to enable early institution of interventions for risk factor modification in a pursuit to reduce cardiovascular mortality and morbidity. Psoriasis should be viewed as a multisystem disease and extent of systemic involvement should be ascertained and the disease should be aggressively treated to reduce systemic inflammation, a correlate of cardiovascular risk.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Bhat B, Dogra N, Dogra D. A hospital based study to assess the prevalence of cardiovascular risk factors among patients of chronic plaque psoriasis. Int J Res Med Sci 2016;4:4974-8.