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ORIGINAL RESEARCH

A CROSS SECTIONAL COMPARITIVE STUDY OF METABOLIC SYNDROME IN PSORIASIS AND CHRONIC ECZEMA IN A TERTIARY CARE HOSPITAL OF ODISHA, A STATE IN EASTERN INDIA

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ABSTRACT

Introduction: Psoriasis is a chronic inflammatory disease of skin and joint associated with cardiovascular morbidity.Previous studies have shown higher prevalence of metabolic syndrome in psoriasis patients.

Material & Methods: In this study 60 adult patients from each group with psoriasis and chronic eczema were included for assessment of metabolic syndrome.Metabolic syndrome was diagnosed based on the presence of three or more criteria of the National Cholesterol Education Program, Adult Panel III (ATP III) with Asian modification for waist circumference.

Results: Metabolic syndrome was significantly more common in psoriatic patients than in eczema patients ((23)38.3% VS (13) 21.6%) P=0.046. Psoriatic patients had a higher prevalence of triglyceridemia, low HDL levels and elevated blood sugaras compared to those findings in chronic eczema group of patients.

Conclusion: In view of our study showing strong association between metabolic syndrome and psoriasis, it is recommended that all psoriasis patients should be screened for early detection of metabolic syndrome so as to prevent mortality and morbidity related to metabolic syndrome. In eczema, the prevalence of metabolic syndrome is comparable to that observed in normal population of this region.

Keywords: Psoriasis, metabolic syndrome, eczema, diabetes, HDL, BSA, PASI

INTRODUCTION

Psoriasis is a chronic T-cell mediated inflammatory and proliferative disorder of the skin with systemic organ involvement having a prevalence of 1-3%[1].

Psoriasis is associated with metabolic syndrome(MS) as evidenced by many studies done in western population[1].

There has been a rapid expansion of scientific data relating psoriasis with MS. Since there is a significant difference in demographic features and eating habits (rice eaters and more non-vegetarain) in Eastern Indian population. In view of the above fact this study was being conducted to look into prevalence of MS in psoriasis as compared to that in chronic eczema.

MATERIAL AND METHODS

This study was done in the outpatient department of Dermatology, Venereology and Leprosy, in a tertiary care center in Odisha, a state in eastern belt of India where non-veg food including fish is consumed very commonly in diet. This was an age and sex matched cross sectional comparative study conducted between October 2019 to September 2021 and included sixty psoriasis patients and sixty eczema patients fulfilling the inclusion and exclusion criteria. Ethical clearance was taken from institutional ethical committee. Before starting the study, informed consent was taken from all the patients.

General data including age, sex, disease duration, symptoms, treatment history, smoking and alcohol consumption, family history, history of cardiovascular and cerebrovascular disease, type and distribution of lesions were recorded. Waist circumference and BP measured and recorded.

To assess the severity of psoriasis, BSA (Body Surface Area) and PASI (Psoriasis Area and Severity Index) were recorded. Wherever diagnosis was doubtful, histopathology was performed for both psoriasis and eczema cases.

Inclusion criteria were those consenting for study, age ≥18 years, presenting with characteristic clinical features of psoriasis or eczema, disease duration of at least 6 months. Exclusion criteria were those who were not consenting for study, familial hypolipoproteinemia, thyroid disorders, congenital or acquired medical conditions which can predispose to abnormal lipid profile, glucose intolerance, medications like OCP, systemic corticosteroids and retinoids, which can alter serum lipid profile, blood glucose and blood pressure, pregnant and lactating women, age <18 years.

Waist circumference was measured by keeping measuring tape horizontally at upper part of the hipbone around abdomen. Patients were asked to sit for 5 minutes and blood pressure was calculated as the average of two measurements.

After overnight fasting for at least 8 hours, serum samples were taken for HDL cholesterol, triglycerides and blood sugar.

Patients were screened for metabolic syndrome as per definition by National Cholesterol Education Program Adult Panel III 2001[2].

Diagnosis of Metabolic Syndrome is made when 3 or more of 5 criteria proposed by the updated National Cholesterol Education Program Adult Treatment Panel III (ATP III), with Asian modification for waist circumference. The criteria are 1. Central obesity: Waist circumference ≥102 cm in male and ≥88 cm in female, 2. Hypertriglyceridemia: Triglyceride ≥150 mg/dl or on specific medications, 3. Low high-density lipoprotein (HDL) cholesterol:

<40 mg/dl for male and <50 mg/dl for female, 4. Hypertension: Systolic blood pressure ≥130 mmHg and diastolic blood pressure≥85 mmHg or on specific medications and 5. Fasting blood glucose: ≥100 mg/dl or on specific medications or previously diagnosed type 2 diabetes mellitus[2].

Characteristic findings of psoriasis skin lesion like erythema, scaling and induration help to assess the severity of psoriasis. The current gold standard parameter used for assessment of extensive psoriasis has been the Psoriasis Area and Severity Index (PASI). PASI is a measure of the average erythema, scaling and induration of the lesions (each is graded on a 0-4 scale), weighed on the basis of involved area. Based on rule of 10, psoriasis is considered as moderate to severe if PASI more than 10 or BSA more than 10 or DLQI more than 10[3].

BMI was calculated by dividing weight in kg by height in meter[2]and categorized into 4 groups with BMI less than 18.5 as underweight, between 18.5 to 24.9 as normal BMI, between 25 to 29.9 as overweight and BMI more than 30 as obesity[4].

Computer assisted analysis was done using IBM SPSS-24.0 (Chicago, IL, USA) and P-value of less than 0.05 was taken as statistically significant[5].

RESULTS

The age of the psoriasis and eczema patients varied from 18 to 80 years with a mean of 42.93 years and standard deviation 12.11 years. Among psoriasis and eczema patients 41(68.3%) were male and 19 (31.6%) females. In psoriasis group patients types of psoriasis included chronic plaque psoriasis, palmoplantar psoriasis, scalp psoriasis and erythrodermic psoriasis [commonest type: chronic plaque psoriasis45(75%)]. Disease duration was less than 10 years in 54(90%) patients, 4(6.6%) between 11-20 years and 2(3.3%) more than 20 years. In eczema group patients types of eczema included asteatosis eczema, ACD, palmar and plantar hyperkeratotic eczema, nummular eczema, [commonest type: ACD 20 (33%)]. Disease duration was less than 1 year in 34(56.7%) patients, between 1-10 years in 22(36.7%) and more than 10 years in 4(6.7%) patients.

Among psoriasis patients, normal BMI was seen in 30(50%) patients and 24(38.3%) patients were overweight, 4(6.6%) patients were obese and 2(3.3%) patients were underweight whereas among patients with eczema 33(55%) had normal BMI, 22 (36.6%) were overweight, 3(5%) patients were obese and 2(3.3%) patients were underweight. 13(54.1%) psoriasis patients with metabolic syndrome had BMI between 25-29.9 and 2(9%) with metabolic syndrome had BMI more than 30 whereas 5(38%) eczema patients with metabolic syndrome had BMI between 25-29.9 and 2(15%) had BMI more than 30.

Body surface area (BSA) was calculated to correlate metabolic syndrome with severity of psoriasis. Patients were broadly categorized into 2 groups which were mild psoriasis group (less 10% BSA) and moderate to severe psoriasis group (more than or equal to 10% BSA.) Out of the 23 psoriasis patients with metabolic syndrome, 13 cases (56.53%) were having mild psoriasis whereas 10 cases (43.47%) were having moderate to severe psoriasis.

We found higher proportion of psoriasis patients with metabolic syndrome had mild psoriasis (BSA less than 10 %).

Psoriasis Area severity index (PASI) was calculated to correlate the occurrence of metabolic syndrome and a high PASI score. The patients were broadly divided into 2 groups which

were mild psoriasis (PASI less than 10) and moderate to severe psoriasis (PASI more than or equal to 10).

41(68.3%) patients had mild psoriasis whereas 19(31.7%) patients had moderate to severe psoriasis. Among moderate to severe psoriasis 9(15%) had PASI between 21-30, 5(8.3%) had PASI between 11-20, 4(6.6%) had PASI between 41-50 and 1(1.66%) had PASI between 31-40. No patient had PASI above 50. 7(30.4%) patients with moderate to severe psoriasis had metabolic syndrome and 16(69.6%) patients with mild psoriasis had metabolic syndrome. We found higher proportion of psoriasis patients with metabolic syndrome had mild psoriasis (PASI less than 10 %).

Among psoriasis patients, diabetes mellitus was the most common comorbidity seen in 14(23.3%), followed by hypertension in 7(11.6%), dyslipidemia in 3(5%), CAD in 3(5%) and bronchial asthma in 3(5%). No comorbidities were seen in 34(56.6%) patients. Among eczema patient's comorbidity was seen in 10(16.66%) patients with diabetes mellitus seen in 6(10%), followed by hypertension in 3(5%) and dyslipidaemia in 1(1.6%) patient. No comorbidities were seen in 50(83.3%) patients.

Central obesity was found in 17(28.3%) psoriasis patients and 19(31.6%) eczema patients. Hypertension was found in 19(31.6%) psoriasis patients and 22 (36.6%) eczema patients. Impaired fasting glucose was seen in 19(31.6%) psoriasis patients and 11(18.3%) eczema patients.

Hypertriglyceridemia was seen in 25(41.6%) psoriasis patients and 13(21.6%) eczema patients. High HDL levels was seen in 24(40%) psoriasis patients and 11(18.3%) eczema patients.

Hypertriglyceridemia was the most common deranged parameter of metabolic syndrome in psoriasis and hypertension in eczema. The least deranged parameter in psoriasis was central obesity and impaired fasting glucose and low HDL levels in eczema patients.

Metabolic syndrome was detected in 23(38.3%) psoriasis patients where as it was detected in 13(21.6%) of eczema patients. Among 23 psoriasis patients with metabolic syndrome, 14(60.9%) patients were male and 9(39.1%) were female. Out of 13 eczema patients with metabolic syndrome, 9(69.2%) were males and 4(30.8%) were females.

Among 23 patients with metabolic syndrome only 9(39%) patients had a duration more than 6 years.

DISCUSSION

In our study 41 patients had PASI scores below 10 which shows that they were less severely affected patients and were treated on outpatient basis.

Only 4 patients had PASI score above 40 who required hospital admission and treatment.

Among23 psoriasis patients with metabolic syndrome 14(61%) patients had disease duration less than 6 years. There is no increase in occurrence of metabolic syndrome with disease duration in our study. Likin Zindancı et al observed that there was no association between metabolic syndrome and disease duration[6].However, Sommer et al., reported occurrence of metabolic syndrome with longer duration of the disease[7].Gisondi et al., also reported that metabolic syndrome occurs more commonly in older psoriasis with prolonged disease duration[8].

Among 23 psoriasis patients with metabolic syndrome, mild psoriasis (BSA less than 10) was seen in 13(56.53%) patients and moderate to severe psoriasis (BSA more than 10) in 10(43.57%) patients.

There was no correlation between prevalence of metabolic syndrome and BSA involvement in study done by Nisa and Qazi et al.,[9]which was in concordance with our study.

Among 23 psoriasis patients with metabolic syndrome, PASI more than10 was present in 7(30.4%)cases, whereas PASI less than 10 was present in 16(69.6%)cases. These results were similar to previous studies. Sristi Lakshmi et al.,[10]reported that Metabolic Syndrome was independent of PASI. Gisondi *et al.*,[8]and Nisa and Qazi[9]had obtained similar results. They found there was no difference in the prevalence of Metabolic Syndrome based on PASI score. Our study found that majority of the patients were affected by mild psoriasis which could be due to climate, dietary habits etc.

Central obesity was seen in 17 (28.3%) psoriasis patients and 19(31%) eczema patients (*P*=0.690). This was similar to study done by Nisa and Qazi[9](14% vs 20%).

Studies conducted by Gisondi et al., (57.1% vs 47.6%)[8], Thorvardur et al (62.9% vs 49.9%)[11] and Jacob Drehier and Dahlia (24% vs 17.9%).[12]had higher proportion of central obesity in psoriasis patients.

Fasting blood sugars were elevated in 19(31.66%) psoriasis patients and 11(18.33%) eczema patients. (*P*=0.092)

Higher occurrence of diabetes in psoriasis patients have been shown in studies by Sommer et al[15], Shapiro et al[22], Cohen et al[23]and Neimann et al.[14]

It is considered that impaired fasting glucose (IFG) is a pre-diabetic state, related to insulin resistance with higher chance of cardiovascular complications, but lower risk when compared to impaired glucose tolerance (IGT).

Impaired fasting glucose may show progression towards type 2 diabetes mellitus. Ten-year risk of progression to overt diabetes is 50%. Nicolas et al in his study showed that the average time for this progression is lesser than 3 years.[13]

Impaired fasting glucose is also considered as risk factor associated with higher mortality.

Hypertension was seen in 19(31.66%) psoriasis patients and 22(36.6%) eczema patients (*P*=0.564). Cohen et al [16]who reported higher levels of hypertension in psoriasis patients when compared to controls (38.8%, 29.1% respectively). Jacob Drehier and Dahl also reported higher levels of hypertension in psoriasis patients when compared to controls (37.5%, 29% respectively)[12]Sommer et al. [15]also reported similar results.

Impaired triglyceride levels were seen in 25(41.66%) psoriasis patients and 13(21.66%) eczema patients (P<0.019). This is similar to study of Laurie Barclay et al[24](44% in cases), Gisondi et al[8](37.8% vs 23.3% of controls) and Jacob Drehier and Dahlia [14](57.1% vs 47.4% of controls).

Low levels of HDL were seen in 24(40%) psoriasis patients and 11(18.33%) in eczema group(P<0.009). This was in concordance with studies done by Gangaiah et al (50% vs 20%), Mebazaa et al (60.9% vs. 35.9%) and Rocha-Pereira et al who reported low levels of HDL in psoriasis .[17,26]

In our study 23(38.3%) psoriasis patients had metabolic syndrome compared to 13(21.6%) eczema patients which correlated with the previous studies. (P<0.046)

Occurrence of metabolic syndrome in eczema was comparable to study done by Bhalwar et al.,[27]in general population and Shalom et al.,[25]in moderate to severe atopic eczema.

Isabela Guimarães Ribeiro Baeta et al reported 80 (44.9%) patients having metabolic syndrome based on NCEP-ATP III diagnostic criteria.[18]

Niti Khunger et al reported metabolic syndrome in 30% of cases and 8% of controls which was statistically significant ($P < 0.005$).[19]

Prevalence of metabolic syndrome between 14% to 40% was reported by Catherine Ni and Melvin W Chiu.[20]

Sinéad M. Langan et al reported 34% of psoriasis patients having metabolic syndrome compared with 26% of controls in his study.[21]

Gisondi et al also reported higher proportion of metabolic syndrome in psoriasis patients than in control group having skin disease other than psoriasis (30.1% vs. 20.6%) .[8]

But Sristi Lakshmi et al reported metabolic syndrome in 13(32.5%) out of 40 psoriasis patients and 12(30%) out of 40 in control group having skin diseases other than psoriasis[10].

The prevalence of metabolic syndrome in India among adult population was 30% based on study done by Krishnamurthy et al.[28]

The prevalence of metabolic syndrome in psoriasis group 38.3% is higher than general population and in eczema group 21.6% is lower than general population.

In a cohort study done in Sweden comparing cardiovascular mortality in hospitalized psoriasis patients and outpatient controls, 50% greater risk of cardiovascular death was seen among psoriasis inpatients.

Metabolic syndrome is a growing concern to the modern day society because of higher risk of cardiovascular diseases.

Our study indicates that there is a significant association of metabolic syndrome with psoriasis within the study population.

So measures should be taken to detect metabolic syndrome simultaneously along with diagnosis of psoriasis, counselling and aggressive management in the form of balanced diet low in fat, adequate nutrients and antioxidants, exercise in the form of yoga should be initiated which may prevent the progression of metabolic syndrome to decrease the risk of cardiovascular morbidity.

CONCLUSION

In view of our study showing strong association between metabolic syndrome and psoriasis, it is recommended that all psoriasis patients should be screened for early detection of metabolic syndrome so as to prevent mortality and morbidity. In eczema, the prevalence of metabolic syndrome is comparable to that observed in normal population of this region.

CONFLICT OF INTEREST

None to Declare.

FUNDING SOURCE

The study was conducted using Institutional/Departmental resources and this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

ETHICAL APPROVAL

This study was approved by the Research Ethics Committee of the Institute. This study was conducted in accordance with the Declaration of Helsinki.

Author's Contribution

KV conducted the whole study,intake of cases,investigation and analysis.JRD provided the patients and writing of paper.CRS helped in guiding methodology,analysis and editing.HKK initiated the project concept,helped in analysis,writing discussion and final editing. FN contributed to the data and performed manuscript review and proofreading.

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