A Case Control Study to Determine the Association of Psoriasis with Metabolic Syndrome in a Tertiary Care Centre

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***Abstract*-** Several studies have linked psoriasis with metabolic syndrome (MS), but only a few of them have used population specific criteria for diagnosis of MS. None of the previous studies have explored whether MS is more frequent in psoriasis when compared to another chronic inflammatory disease of skin.
Aims: To find out if there is any association between psoriasis and MS; to study the contribution of individual components of MS towards such association and to explore the relationship of MS with clinical type, duration and severity of psoriasis.

Methods and Material**:** A hospital based case-control study was conducted involving 150 patients with psoriasis as cases and 150 patients with eczema as controls. The differences between the two groups regarding various components of MS were studied by univariate analysis. **Result:** Psoriasis was associated with MS (Odd's ratio (OR) 1.9 (1.3 – 3.3), p = 0.02). Increased duration (p = 0.04) and severity of psoriasis (p 0.01) was associated with MS. Waist circumference (p = 0.001) was identified as the key factor which contributed for development of MS. **Conclusion:** There was an overall association of psoriasis with MS. Among the individual components of MS, increased waist circumference was significantly associated.Patients with greater duration or severity of psoriasis were more likely to have an association with MS.

***Index Terms*-** dyslipidemia, metabolic syndrome, obesity, psoriasis

I. INTRODUCTION

Introduction: Psoriasis is now considered as a systemic inflammatory disease. The chronic inflammatory nature of psoriasis has been suggested to be a contributing and potentially independent risk factor for development of MS.[1]Several studies has shown an association between psoriasis and MS. Most of these were of cross sectional design. There have been only a few case control studies addressing the issue. [2,3,4,5,6,] Only a few studies from India have used the revised population specific criteria for diagnosis of MS .[2,3,6] A recent study from Pakistan concluded that inclusion of modified waist circumference and specific body mass index (BMI) cut offs for Asians may help predict MS at an early stage. [7] Control groups in the previous case control studies were either healthy people or persons attending the hospital for various skin diseases. [2,3,4,5,6] We thought that comparing the association of MS in psoriasis with another chronic and often recurrent inflammatory skin disease such as eczema would be more informative. As the lifestyle changes and effect of chronic inflammation of the skin can be expected to be comparable in both groups, any further difference observed between the groups can be more directly attributed to the disease process of psoriasis. Our aim was to establish any association between psoriasis and MS and if so, to find out which all components of MS contributed to such association and to study the relationship of MS with various clinical features of psoriasis such as type, duration and severity.

Materials and Methods: The setting of this case control study was the outpatient department of Dermatology & Venereology in a tertiary care teaching hospital. The sample size was calculated using the software epi info, for a power of 80% and confidence level (1alpha) of 95 %.This was based on previous studies which showed an estimated prevalence of MS in general population as 23% [8] with an Odds ratio of 2.1 in psoriasis.[5] According to sample size calculation, we studied 150 consecutive patients with psoriasis who attended our OP as cases and an equal number of patients with recurrent episodes of generalized eczemafor more than one year as controls. Patients aged less than 18years were excluded from both the study population since we intended to study the adult population. Written informed consent was obtained from all subjects. The study was approved by the Institutional Review Board. We prepared a proforma to record the demographic and clinical details of the patients. The information collected included the age of onset of psoriasis, habits like smoking and alcohol use and history of diabetes mellitus (DM), hypertension and coronary artery disease (CAD). Clinical examination included measurement of height, weight, waist circumference and blood pressure (BP). Body mass index (BMI) was calculated as weight in kg / height^2 in metres. Clinical type of psoriasis, presence of scalp and nail involvement and psoriatic arthritis were noted. Severity of psoriasis was assessed using PASI score. We used 'The IDF consensus worldwide definition of MS' which defines central obesity specific for each population.[9] We also estimated Fasting blood sugar (FBS) and fasting lipid profile (FLP) of all subjects . The results were collected from the laboratory. Data was entered in Microsoft Excel and analysed using SPSS version 16. The statistical tests used were chi square test, t test and z test. P value of less than 0.05 was considered as statistically significant.

Results: General characteristics of the study group are shown in Table 1.

Table 1: General characteristics of study population

Characteristics	Cases (n=150)	Controls (n=150)
Age (Mean ± standard deviation (SD))	48.73 ± 12.83	51.4 ± 14.34
Age :(Range)	19 - 85	21 -85
Male / Female (M : F)	99/51 (1.94:1)	86/64 (1.34:1)
BMI (Mean ± SD)	23.96 ± 5.33	23.56 ± 2.48
Smoking	55 (37%)	50 (33%)
Alcohol	66 (44%)	52 (35%)
H/o Diabetes Mellitus	28 (19%)	19 (13%)
H/o Hypertension	31 (20%)	32 (21%)
H/o Coronary artery disease (CAD)	13 (9%)	12 (8%)
H/o Dyslipidemia	10 (7%)	9 (6%)

Though smoking, alcoholism, presence of DM and CAD had OR greater than one, these were not statistically significant.

A higher overall prevalence of MS was seen among cases compared to controls across all age groups (Fig1).

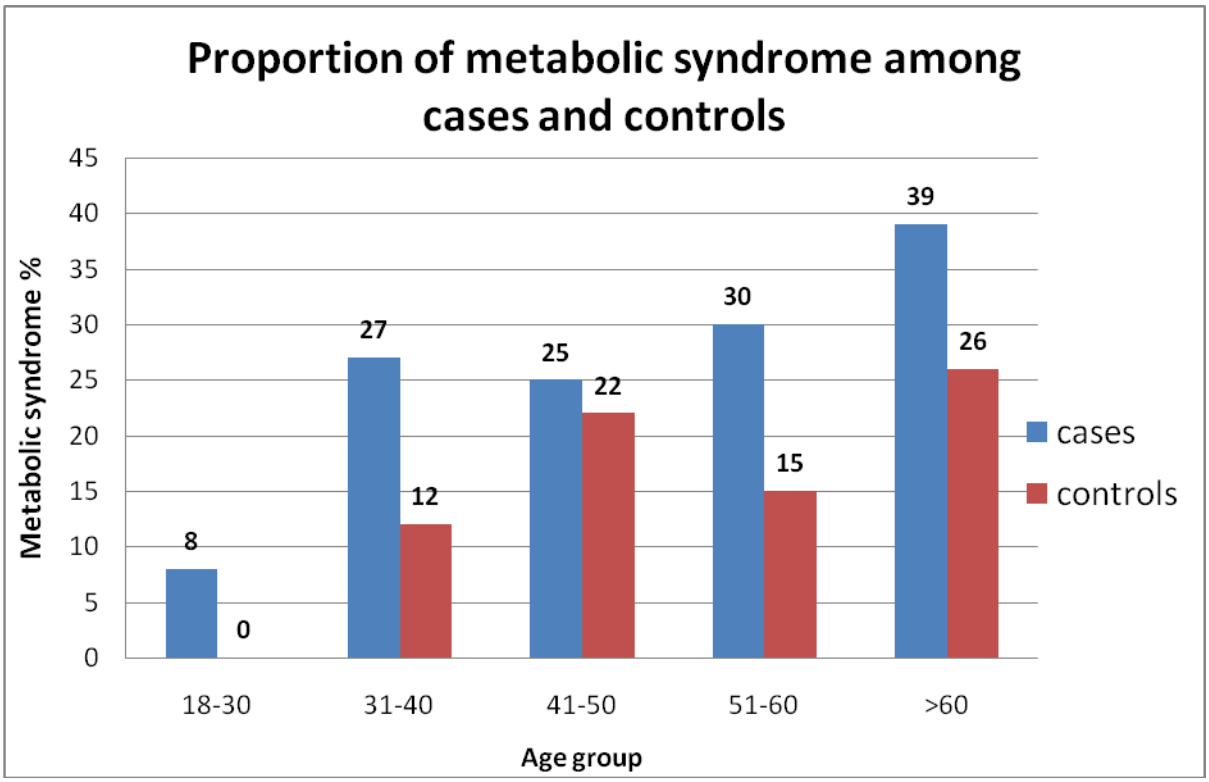

Fig1: Proportion of metabolic syndrome in cases and controls in different age groups

When the prevalence of individual components of MS were analysed between cases and controls, only waist circumference showed significant difference between the groups (p 0.007) (Table 2).

Table 2: Prevalence of metabolic syndrome & its components among cases & controls

Characteristics	Cases (n=150)	Controls (n=150)	Odd's ratio (OR)	Confidence interval (CI)	P value (p)
Metabolic syndrome	44(29.33%)	27 (18%)	1.9	(1.1 -3.3)	**0.02**
Waistcircumference ≥90cm in males & ≥80cm in females	84(56%)	59(39.3%)	1.86	(1.2 – 2.9)	**0.007**
FBS≥ 100mg/dl	53(35.3%)	54(36%)	1.14	(0.63-2.02)	0.6
HDL <40mg/dl in males & <30mg/dl in females	20(13.33%)	30(20%)	0.72	(0.4 – 1.2)	0.2
TG ≥ 150mg/dl	31(20.67%)	41(27.33%)	0.69	(0.4 – 1.1)	0.17
BP ≥130mmHgSBP / ≥85mmHg DBP	65(43.33%)	64(42.67%)	1	(0.62 – 1.63)	1

When psoriasis patients with and without MS were analysed (Table 3), all variables except clinical type of psoriasis, BP and FBS showed significant difference between the groups**.** MS was significantly associated with psoriasis of more than ten years duration (p 0.01), PASI score of more than twelve (p 0.04), scalp involvement (p 0.05)and presence of psoriatic arthritis (p 0.02).

Table 3: A comparison of clinical features of psoriasis patients with and without metabolic syndrome

Variables	MS +	MS -	P value
Smoking	9(16.4%)	46(83.3%)	**0.007**
Alcohol use	13 (19.7%)	53(80.3%)	**0.02**
Scalp involvement	31(70.5%)	89(84%)	**0.05**
Type of psoriasis (chronic plaque psoriasis vs others)	73.5%	83 (73.3%)	0.8
Severity of psoriasis (PASI > 12)	20(45%)	30(28%)	**0.04**
Psoriatic arthritis	10(23%)	10(0.1%)	**0.02**
Duration > 10yrs	21(48%)	28(26%)	**0.01**
BMI	32(72%)	49(46%)	**0.002**
Waist circumference ≥90cm in males & ≥ 80cm in females	44 (100%)	62 (58%)	**0.001**
BP: ≥130mmHgSBP / ≥85mmHgDBP	37 (84%)	86 (81%)	0.66
FBS ≥ 100mg/dl	42 (95%)	104 (98%)	0.35
TG≥150mg/dl	22(50%)	97(91%)	**0.001**
HDL <40mg/dl in males & <30mg/dl in females	18(16.4%)	92(83.6%)	**0.001**

Discussion: Our study shows that increased prevalence of MS is more among patients with psoriasis compared to patients with chronic and recurrent eczema. A few previous case control studies had shown an association between psoriasis and MS , but only a few from India have used the population specific criteria for diagnosis of MS.[2,3,6] Previous case control studies had selected either healthy persons or patients with miscellaneous skin diseases as controls. This is the first study which compares the prevalence of MS in psoriasis with another chronic inflammatory disease of the skin.

Increased waist circumference (p 0.001) was the component of MS recognized, which predisposed for MS. Factors such as decreased physical activity due to social stigma or depression, alcohol consumption and presence of psoriatic arthritis may result in obesity in patients with psoriasis. Obesity is a proinflammatory state and the adipose tissue is a rich source of inflammatory mediators known as adipocytokines and TNFα. These products have well-known roles in the pathogenesis of psoriasis and MS.[10]

We also observed that psoriatic patients with MS have significantly higher BMI compared with those without MS. Patients with BMI>25kg/m^2 are prone to develop MS (p0.01). The American Heart association has recommended achieving BMI of less than 25kg/m^2 as a first line therapy for MS.[11]

There are conflicting reports regarding the association of duration of disease and severity of psoriasis with MS. We obtained statistically significant association between duration of psoriasis and MS [OR: 2.5(1.2-5.3) and p0.01] which is in accordance with some studies [5] and in contrast to some other studies. [2,3,12] Some have reported an increased prevalence of MS in patients with moderate-to-severe psoriasis. [13,14] On the contrary, a few other studies[2,5,12,15,16] detected no correlation between severity of psoriasis and MS. We noticed that patients with PASI >12 had noteworthy association with MS (p0.04).

Limitation of our study is that since it is a hospital based study ,the results cannot be generalised. Population based studies should be conducted to overcome the hitch .

To conclude, our study shows that MS is more prevalent in psoriasis compared to another inflammatory disease of skin . Dermatologists being the caretakers of psoriatic patients should screen them for risk factors for development of MS and ensure that they receive appropriate counselling and treatment.

Appendix
Table 1: General characteristics of study population
Table 2: Prevalence of metabolic syndrome & its components among cases & controls
Table 3: A comparison of clinical features of psoriasis patients with and without metabolic syndrome
Fig1: Proportion of metabolic syndrome in cases and controls in different age group

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