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A Study on Assessment of Comparison of Psoriatic Patients with and Without Metabolic Syndrome

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ABSTRACT
Psoriasis has been shown to be an independent risk factor for myocardial infarction, particularly in young patients and severe psoriasis has been shown to be associated with increased mortality in patients with cardiovascular disease. This comprehensive concept of metabolic syndrome is of clinical significance because it can be a strong predictor of cardiovascular diseases, diabetes and stroke. A detailed history taking included duration of the disease, joint pains, smoking, alcohol consumption, diet, presence of other systemic illness, past intake of systemic agents for psoriasis and concomitant intake of medicines for other illnesses. Clinical examination included measurement of height, weight, waist circumference, hip circumference and blood pressure. The body mass index (BMI) was by weight in kg/square of height in meters. According to Indian guidelines, a BMI from 23-24.9 is overweight, a BMI greater than or equal to 25 is moderate obesity and a BMI greater than or equal to 30 is severe obesity. We noted that presence of impaired fasting glucose is a strong predictor for developing metabolic syndrome in the patients without metabolic syndrome (OR-6, p = 0.017). When comparing both the groups with and without metabolic syndrome, we observed significant correlation between HDL levels, TG and LDL levels and metabolic syndrome. Cholesterol levels have no significant correlation with metabolic syndrome. There was no correlation between the severity of psoriasis and occurrence of metabolic syndrome. This study has to be continued for years to know the real prevalence. all patients must be screened for cardiovascular risk factors as per the proposed guidelines at the disease onset irrespective of the disease severity and more so in those patients where systemic therapy is being considered.

INTRODUCTION

In 1988, Reaven proposed the term ''syndrome X'' for the combination of glucose intolerance, hypertension, hyperinsulinemia, high-density lipoprotein (HDL) cholesterol, high triglyceridimea and hypertension. In 1991, De Fronzo named the clustering of metabolic disorders, including non-insulin-dependent DM, obesity, hypertension, lipid abnormalities and atherosclerotic cardiovascular disease as ''insulin resistance syndrome''[1].

Moreover, psoriasis has been shown to be an independent risk factor for myocardial infarction, particularly in young patients and severe psoriasis has been shown to be associated with increased mortality in patients with cardiovascular disease. This comprehensive concept of metabolic syndrome is of clinical significance because it can be a strong predictor of cardiovascular diseases, diabetes and stroke[2].

The prevalence of metabolic syndrome is increasing (30-40%) in part paralleling the rising prevalence of obesity worldwide. Systemic inflammation is associated with metabolic syndrome, with T helper cell type 1 (Th-1) pro-inflammatory cytokines such as tumor necrosis factor a and non-specific measures of inflammation such as C reactive protein levels being elevated compared to those without the metabolic syndrome However, there is a limited understanding of the relationship between chronic inflammatory diseases and the prevalence of metabolic syndrome[3].

The association between psoriasis and metabolic syndrome is also true for mild severity psoriasis and is independent from the tendency of psoriatic patients to be obese. Yet despite numerous studies linking psoriasis and cardiovascular disease, translating these studies into clinical guidelines has been hampered by the lack of accurate cardiovascular risk prediction in the psoriasis population[4].

Psoriasis is a chronic, immunologically based inflammatory skin disease[5]. Over the last decade, many studies world over have shown that people with psoriasis often have comorbidities like diabetes, hypertension and lipid abnormalities[6-8]. However, there have been very few studies so far on the risk factors and comorbidities associated with psoriasis in Indian patients[9-11].

MATERIALS AND METHODS

The study was a hospital based cross sectional study conducted in the outpatient department of dermatolgy. Eigthypatients diagnosed as psoriasis who are more than 18 years were included in the study.

After obtaining the informed consent, all patients were subjected to detailed history taking and clinical examination. A detailed history taking included duration of the disease, joint pains, smoking, alcohol consumption, diet, presence of other systemic illness, past intake of systemic agents for psoriasis and concomitant intake of medicines for other illnesses. Clinical examination included measurement of height, weight, waist circumference, hip circumference and blood pressure. The body mass index (BMI) was by weight in kg/square of height in meters. According to Indian guidelines, a BMI from 23-24.9 is overweight, a BMI greater than or equal to 25 is moderate obesity and a BMI greater than or equal to 30 is severe obesity. The waist circumference was measured by placing the measuring tape snugly around the abdomen at the level of the iliac crest. A waist circumference of more than 90 cm and 80 cm for men and women, respectively, was considered as abdominal obesity. The blood pressure was taken in the sitting posture and the average of two measurements was recorded. Extent of involvement was assessed by body surface area affected by psoriasis mild <5% of the surface area moderate 5-30% and severe >30%. Psoriasis area and severity index (PASI) is also calculated.

All patients underwent Serum glucose levels, lipid profile which included total cholesterol, low density lipoprotein (LDL), high density lipoprotein (HDL) and triglyceride levels and Liver function test. Patients were considered to have diabetes if their fasting glucose was more than or equal to 100 mg/dL.

MS was diagnosed using the South Asian Modified National Cholesterol Education Program Adult Treatment Panel III criteria (SAM-NCEP criteria)[5].

If three or more of the following were present, the patient was diagnosed as having MS:

- 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)
- Blood pressure >130/85 mmHg
- 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)
- BMI was calculated and was substituted for obesity

Statistical Analysis: Data entry and analysis was done using statistical package for social sciences (SPSS) version 16.0 software. Percentages, mean, standard deviation, correlation, chi-square test, t-test were calculated at 5% level of significance.

RESULTS AND DISCUSSIONS

Our study included 80 patients which include 50 (62.5%) males and 30 (37.5%) females. Age at the time of first visit varied from minimum of 23 years to

Table 1: Descriptive characteristics of the study population

Variable	Mean±SD	Min-Max.
Sex M/F (%)	50 (62.5)/30 (37.5)	
Age @ enrolment	43.02±8.489	24-66
Duration of psoriasis	6.288±5.24	2 months-20 years
BSA	25.1±18.18	3-52
PASI	50.31±33.508	8-108
BMI (mean±SD)	27.53±6.306	19-42
Waist circumference	96.3±15.68	68-132
Waist /hip ratio	2.03±0.048	1-1
HDL <40 infemales, <50 in males	54.94±8.984	39-71
Triglycerides >150 mg/dL	109.91±30.93	60-172
Blood pressure >135/85	121.6±14.64/81.24±9.82	100/60 to150/90
Fasting blood sugar = 100 mg/dL	114.01±59.738	62-41
Metabolic syndrome	22 (27.5%)	

Table 2: Comparison of psoriatic patients with and without metabolic syndrome

Variable	Psoriasis without metabolic syndrome (n = 58)	Psoriasis with metabolic syndrome (n = 22)	t	p-value
Age	41.40±10.21	49.63±8.61		
DBP	78.81±9.23	91±0.00	11.216	0.0001
SBP	117.81±13.16	137.63±5.90	9.771	0.0001
BMI	26.50±3.74	35.60±7.71	5.564	0.0001
Duration	6.62±5.65	4.80±2.51	3.249	0.04
BSA	25.63±17.50	23.80±3.21	0.31	0.79
PASI	50.60±31.03	49.15 ±43.50	0.115	0.92
Waist circumference	91.60±10.4	116.4±15.70	6.59	0.0001
Waist hip ratio	2.03±0.06	2.03±0.03	0.678	0.51
Fasting blood sugar	97.10±18.30	181.64±105.80	3.786	0.02
Serum cholesterol	177.25±42.30	194.4±60.80	0.944	0.38
HDL	57.26±8.01	45.63±4.4	6.51	0.0001
TG	103.31±25.30	136.18±37.70	4.79	0.0001
LDL	107.84±42.20	138.2±46.30	3.21	0.04

maximum of 65 years with mean age of 43.02 years. We found there is increase in age is proportionate to the appearance of metabolic syndrome. Duration of psoriasis varied from 2 months to 20 years with the mean duration of about 6.288 years. Duration of psoriasis has significant positive correlation with the severity of psoriasis as shown in Table 1.

We noted that presence of impaired fasting glucose is a strong predictor for developing metabolic syndrome in the patients without metabolic syndrome (OR-6, p = 0.017). When comparing both the groups with and without metabolic syndrome, we observed significant correlation between HDL levels, TG and LDL levels and metabolic syndrome. Cholesterol levels have no significant correlation with metabolic syndrome. There was no correlation between the severity of psoriasis and occurrence of metabolic syndrome. In particular, there was no difference in the prevalence of MS in patients with a PASI score lower or higher than 10 or in patients with BSA involvement lower or greater than 10% as given in Table 2.

Often comorbidity appears to be related to common pathogenetic pathways. In contrast to syndromes, which comprise symptoms that appear synchronously, comorbidities reflect timely unrelated secondary disease involving the same or additional organs. Comorbidities tend to arise from complex disorders, they are frequently multigenic and multifactorial and most often demonstrate an inflammatory background. Such is the case with psoriasis. Many studies undertaken in western populations highlight the association between psoriasis and diabetes, obesity, dyslipidaemia and cardiovascular disorders. As a race, Asian-Indians have a higher predisposition to obesity, metabolic syndrome, diabetes and cardiovascular disorders as compared to western populations. There is a paucity of literature highlighting the association of psoriasis with diabetes, dyslipidaemia and cardiovascular disorders in Indian populations[12].

As many of the studies conducted in United States, United Kingdom and Europe suggested higher prevalence of metabolic syndrome. Gisondi *et al*.[12] reported that the prevalence of metabolic syndrome was higher in psoriasis patients (30.1%) than in patients with general dermatological conditions (20.6%). In addition, Sommer *et al*.[13] observed a high prevalence of metabolic syndrome among patients (4.3%) with psoriasis than in controls (1.1%)[14].

But in a Korean study reported the prevalence of metabolic syndrome in psoriatic patient is 10.3% and found no association by this two. Similarly a study conducted in Mumbai by Rickson *et al*.[12] found 18.2% prevalence of metabolic syndrome which is comparable to the general population.

The overall prevalence of MS is about 30-40% in the Indian population, with a higher prevalence in South India[15]. In Punjab study, metabolic syndrome in psoriasis is found to be 25%.16 In our study prevalence of metabolic syndrome in psoriasis to be 20% which is much lower than other studies conducted in India. In our study we found no relation between the severity of psoriasis with metabolic syndrome which is supported by Gisondi *et al*.[12] sommer *et al*.[13] and by many other

studies and in contrast with Cohen *et al*.[17] In our study there was no association between the duration of psoriasis and MS as with other studies.

There have been varying findings on the relationship between the severity of psoriasis and the presence of MS. A Korean study has shown that MS is significantly more prevalent in patients who had moderate and severe disease[18]. Other studies have shown that MS is present irrespective of the extent of involvement. However, they showed a positive correlation between some of the individual components such as triglyceridemia and higher PASI score in these western studies. Our observation is consistent with the latter. Studies have shown that TNFa levels, IL-12 and IL-18 correlate with severity of psoriasis[19,20]. These cytokines also play a role in the development of MS[21]. An increased level of these cytokines in moderate and severe disease is a possible explanation for a higher occurrence of abdominal obesity and triglyceridemia in more severe disease in our study.

We did not observe any difference between the presence of MS and the duration of the disease. Mallbris *et al*.[22] in their study, have shown that patients with new onset psoriasis had increased total cholesterol and HDL than controls, proving the presence of lipid abnormalities even in those with shorter duration of disease. On the contrary, an Indian study by Nisa *et al*. has shown a positive association between longer duration of psoriasis and MS. However, the individual components of MS and the duration were not analyzed. From the discrepancies in earlier studies, it is unclear whether MS is a risk factor for psoriasis or psoriasis is a risk factor for MS.

This is the first study on the association of MS in North Indian patients with psoriasis and the second such study from India. We have confirmed an association between psoriasis and the presence of MS in our North Indian rural population. Though the sample may not be representative of the entire country, it gives an insight into the pattern of comorbidities of psoriasis in our country, prompting quick therapeutic intervention at the onset of disease itself. Secondly, this being a cross-sectional study the direction of association, whether psoriasis is a risk factor for MS or MS is a risk factor for psoriasis, cannot be determined.

CONCLUSION

Severity of psoriasis is not a related factor for metabolic syndrome. As the BMI increases the risk of developing metabolic syndrome is more. Waist circumference is directly proportional to the BMI. Waist-Hip ratio is not a relevant indicator for the assessment of obesity in Indian population. Concurrent occurrence of diabetes with psoriasis increases the risk of metabolic syndrome two fold. This study has to be continued for years to know the real prevalence. all patients must be screened for cardiovascular risk factors as per the proposed guidelines at the disease onset irrespective of the disease severity and more so in those patients where systemic therapy is being considered.

REFERENCES

1. Takahashi, H. and H. Iizuka, 2011. Psoriasis and metabolic syndrome. J. Dermatol., 39: 212-2183
2. Kim, G.W., H.J. Park, H.S. Kim, S.H. Kim and H.C. Ko *et al*., 2012. Analysis of cardiovascular risk factors and metabolic syndrome in korean patients with psoriasis. Ann. Dermatol., 24: 11-15.
3. Langan, S.M., N.M. Seminara, D.B. Shin, A.B. Troxel and S.E. Kimmel *et al*., 2012. Prevalence of metabolic syndrome in patients with psoriasis: A population-based study in the united kingdom. J. Invest. Dermatol., 132: 556-562.
4. Mehta, N.N., Y. Yu, R. Pinnelas, P. Krishnamoorthy, D.B. Shin, A.B. Troxel and J.M. Gelfand, 2011. Attributable risk estimate of severe psoriasis on major cardiovascular events. Elsevier BV, Am. J. Med., 124: 7750-775000000
5. Nickoloff, B.J. and F.O. Nestle, 2004. Recent insights into the immunopathogenesis of psoriasis provide new therapeutic opportunities. J. Clin. Invest., 113: 1664-1675.
6. Christophers, E., 2006. Comorbidities in psoriasis. J. Eur. Acad. Dermatol. Venerol., 20: 52-55.
7. Mallbris, L., F. Granath, A. Hamsten and M. Stahle, 2006. Psoriasis is associated with lipid abnormalities at the onset of skin disease. J. Am. Acad. Dermatol., 54: 614-621.
8. Shapiro, J., A.D. Cohen, M. David, E. Hodak and G. Chodik et al., 2007. The association between psoriasis, diabetes mellitus and atherosclerosis in israel: A case-control study. J. Am. Acad. Dermatol., 56: 629-634.
9. Sundharam, J.A., R. Singh and P.S. Agarwal, 1980. Psoriasis and diabetes millitus. . Indian J. Dermatol. Venereol. Leprol., 46: 158-162.
10. Alexander, E., J. Pinto, G.S. Pal, N. Kamath and M. Kuruvilla, 2001. Disease concomitance in psoriasis: A clinical study of 61 cases. Indian J. Dermatol. Venereol. Leprol., 67: 66-68.
11. Nisa, N. and M. Qazi, 2010. Prevalence of metabolic syndrome in patients with psoriasis. Indian J. Dermatol., Venereology, Leprology, 76: 662-665.
12. Pereira, R., P. Varthakavi and S. Amladi, 2011. A study of the prevalence of diabetes, insulin resistance, lipid abnormalities and cardiovascular risk factors in patients with chronic plaque psoriasis. Indian J. Dermatol., 56: 520-526.

13. Gisondi, P., G. Tessari, A. Conti, S. Piaserico and S. Schianchi et al., 2007. Prevalence of metabolic syndrome in patients with psoriasis: A hospital-based case?control study. Br. J. Dermatol., 157: 68-73
14. Sommer, D.M., S. Jenisch, M. Suchan, E. Christophers and M. Weichenthal, 2006. Increased prevalence of the metabolic syndrome in patients with moderate to severe psoriasis. Arch. Dermatological Res., 298: 321-328.
15. Ramachandran, A., C. Snehalatha, K. Satyavani, S. Sivasankari and V. Vijay, 2003. Metabolic syndrome in urban asian Indian adults: A population study using modified ATP III criteria. Diabetes Res. Clin. Pract., 60: 199-204.
16. Malhotra, S.K., G.S., Dhaliwal, K.J.P.S. Puri, M.L. Gambhir and M. Mahajan, 2011. An insight into relationship between psoriasis and metabolic syndrome. Egyptian Dermatol. Online J., Vol. 7.
17. Cohen, A.D., M. Sherf, L. Vidavsky, D.A. Vardy, J. Shapiro and J. Meyerovitch, 2008. Association between psoriasis and the metabolic syndrome. Dermatology, 216: 152-155.
18. Choi, W.J., E.J. Park, I.H. Kwon, K.H. Kim and K.J. Kim, 2010. Association between psoriasis and cardiovascular risk factors in korean patients. Ann. Dermatol., 22: 300-0
19. Arican, O., M. Aral, S. Sasmaz and P. Ciragil, 2005. Serum levels of TNF-[alpha], IFN-[gamma], IL-6, IL-8, IL-12, IL-17 and IL-18 in patients with active psoriasis and correlation with disease severity. Mediat. Inflamm., 2005: 273-279
20. Trøseid, M., I. Seljeflot and H. Arnesen, 2010. The role of interleukin-18 in the metabolic syndrome. Cardiovasc. Diabetology, 9: 11-0
21. Joshi, H., A. Shukla, D. Patel and T. Jivani, 2022. Study of hematological parameters in early diagnosis of neonatal septicemia in tertiary care center. 1 Eur. J. Mol. Clin. Med., 9: 287-1298