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Demographic Profile of Psoriasis Patients, Associated Co-Morbidities and Their Relation with Disease Severity

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Abstract: Psoriasis is a complex, chronic, multifactorial, inflammatory disease. Objectives of this study were to determine the occurrence of metabolic co-morbidities such as cardiovascular disease, diabetes mellitus, hypertension, dyslipidemia, obesity, MetS and NAFLD in psoriatic patients and to compare their occurrence with controls and to determine if the presence of these metabolic co-morbidities is related to the severity of the psoriasis. This is a single centre case control study done at department of Dermatology, Venerology & Leprosy of a tertiary care centre of Indore. Three hundred patients with Psoriasis Vulgaris were consecutively enrolled over a period of one year from January 2017 to December 2017. Our cases included 300 patients with psoriasis above the age of 18 years and 300 controls. Patients with psoriasis had a higher BMI. 34.1% and 22.5% of patients with psoriasis had grade I and grade II obesity respectively Vs 52.4% and 14.4% among controls. Low HDL levels was the most common feature of metabolic syndrome (64%), followed by abdominal obesity (63%), raised fasting blood sugars (55%), triglyceridemia (34%) and hypertension (27%) in the psoriasis group. Metabolic syndrome and its individual components such as abdominal obesity, triglyceridemia, increased fasting blood sugars and hypertension were significantly more in patients with psoriasis than in controls. In our study there was a significant association between psoriasis and occurrence of MetS and its components like insulin resistance, hypertriglyceridemia, abdominal obesity, hypertension and raised fasting blood glucose. Therefore we propose that all psoriatic patients must be screened for cardiovascular risk factors and their predecessors i.e the metabolic disturbances, at the disease onset itself irrespective of severity and duration, especially those where systemic therapy is being considered or where there is a strong family history of vascular accidents.
Keywords: Psoriasis, hypertension, metabolic syndrome.

INTRODUCTION

Psoriasis is a complex, chronic, multifactorial, inflammatory disease that involves hyperproliferation of the keratinocytes in the epidermis, with an increase in the epidermal cell turnover rate.

Comorbidity refers to the occurrence of one or multiple disorders in association with a given disease and often appears to be related to a common pathogenic pathway [1].

Over the last decade many studies world over have shown that people with psoriasis often have co morbidities like diabetes, hypertension and lipid abnormalities [2-4]. In 2006 an article by Mallbris *et al.* discussed the metabolic disorders in patients with psoriasis [5]. Around the same time Sommer DM *et al.* also showed that metabolic syndrome (MetS) was more prevalent in patients with psoriasis [6]. In 2007 Gisondi *et al.* showed an increased prevalence of MetS in patients with psoriasis [7]. Another important co-morbidity is non-alcoholic fatty liver disease (NAFLD). NAFLD is now regarded as the hepatic manifestation of metabolic syndrome, as it is largely dependent on the underlying insulin resistance [8, 9]. A few recent studies have found an increased prevalence of NAFLD in patients with psoriasis [10]. The exact path mechanisms remain unclear, but are likely to be related to the high prevalence of obesity and metabolic syndrome within this psoriatic patient population [11].

Treatment options that are currently available are either incompletely effective or associated with toxic effects [12]. Adding to this is a host of comorbidities which are being increasingly reported and hence have to be taken into consideration while choosing the best management protocol for the subjects with moderate to severe psoriasis.

Numerous studies world over have repeatedly reported the co morbidities in psoriasis. However there is a paucity of data on the co-morbidities of psoriasis from India [13]. The study was conducted on patients with and without psoriasis in a tertiary care centre of Indore to analyse the occurrence of comorbidities in psoriasis. Objectives of this study were to determine the occurrence of metabolic co-morbidities such as cardiovascular disease, diabetes mellitus, hypertension, dyslipidemia, obesity, MetS and NAFLD in psoriatic patients and to compare their occurrence with controls and to determine if the presence of these metabolic co-morbidities is related to the severity of the psoriasis.

MATERIALS & METHODS

This is a single centre case control study done at department of Dermatology, Venerology & Leprosy of a tertiary care centre of Indore. Three hundred patients with Psoriasis Vulgaris were consecutively enrolled over a period of one year from January 2017 to December 2017. Three hundred patients who attended the skin department for other skin ailments were the controls. The inclusion criteria for the cases were age more than 18 years and clinical diagnosis of plaque type psoriasis. Patients on current treatment and those who received cyclosporine, acitretin, psoralens and methotrexate within the last 6 weeks were excluded from the study. Pregnant and lactating women were also excluded from this study.

After obtaining the informed consent all patients were subjected to detailed history and clinical examination. A detailed history included duration of the disease, joint pains, smoking, alcohol consumption, diet, presence of other systemic illness, past intake of systemic agents for psoriasis & concomitant intake of medicines for other illnesses. Clinical examination included measurement of height, weight, waist circumference and blood pressure. Each participant was thoroughly examined by two dermatologists who classified psoriasis according to the International classification of Diseases, Tenth revision. Extent of involvement was assessed using Psoriasis Area and Severity Index (PASI), a composite score from 0 to 72 that evaluates the erythema, induration, and scaling of the lesions in four body areas (head, trunk, arms and legs).

PASI=0.1(Eh+Ih+ Sh) Ah +0.2(Eu+ Iu+ Su)Au +0.3(Et+It+St)At + 0.4(El+Il+Sl)A

E-erythema, I- infiltration, S- scaling, A- area Mild psoriasis was classified as a PASI < 8, moderate 8 - 10 and severe psoriasis > 10.

All patients and controls underwent laboratory tests including fasting serum glucose levels, lipid profile, liver function tests, and ultrasonography of abdomen.

The demographic data of 300 subjects and 300 controls was analysed by statistical software, SPSS version 17.0. Microsoft Excel® and SPSS® 20 for Windows® were used for data storage and analysis. The qualitative data were expressed in percentages and quantitative data were expressed as mean ± standard deviation. Student's t test and Chi-Square test were used to determine statistical difference between variables.

RESULTS

Our cases included 300 patients with psoriasis above the age of 18 years and varied disease duration, including newly diagnosed patients with psoriasis and patients with long term resistant psoriasis. Among them there was more number of males (58.4%). The mean age of the patients in the psoriasis group was 38.24 ± 10.52 years and in the control group 40.21 ± 11.79 years. 25.5% of males among the psoriatic population had metabolic syndrome compared to 21.6% of the females. Patients with psoriasis had a higher BMI. 34.1% and 22.5% of patients with psoriasis had grade I and grade II obesity respectively Vs 52.4% and 14.4% among controls. There was no significance between overweight and obese patients among both groups (OR=1.23, 95%CI= 0.69-2.19; OR= 1.27, 95%CI= 0.83- 1.94), however patients with psoriasis had a significant proportion of patients with severe obesity (OR= 1.28, 95% CI= 1.14-2.21).

There was significantly more number of smokers in the psoriasis group. Mean duration of psoriasis was 6.41 years with the majority of patients (200 (66%)) having short duration of disease less than 5 years. 75(25%) had psoriatic arthritis. Patients had mild to severe psoriasis with the PASI score ranging from 0.64-68. 250 (83%) had mild psoriasis (PASI<8) and only 30 (10%) had severe psoriasis (PASI> 12).

The commonest type of psoriasis in our study group was plaque type psoriasis, 12 patients had erythrodermic psoriasis, 22 had palmoplantar psoriasis, 9 had psoriasis limited to the scalp and only one patient had inverse psoriasis. There was no significant association between the type of psoriasis and presence of metabolic syndrome or any other comorbidity.

Low HDL levels was the most common feature of metabolic syndrome (64%), followed by abdominal obesity (63%), raised fasting blood sugars (55%), triglyceridemia (34%) and hypertension (27%) in the psoriasis group. Metabolic syndrome and its individual components such as abdominal obesity, triglyceridemia, increased fasting blood sugars and hypertension were significantly more in patients with psoriasis than in controls.

This significance persisted after adjustment for obesity, smoking and abdominal obesity (adjusted OR=1.80, 95% CI= 1.23-2.64). 25 (8%) patients with psoriasis had evidence of coronary artery disease or stroke whereas only 13 (4%) were diagnosed to have coronary artery disease or stroke among controls (p=0.01) (OR=2.23, 95% CI=1.13 -4.40). This significance persisted after adjustment for diabetics and hyper tension. Dyslipidemia was also common among patients with psoriasis.

Almost one quarter of the (75) patients showed elevated liver enzymes and abnormal liver on ultrasonogram. Of these 55 (18%) had non-alcoholic fatty liver disease (NAFLD). The occurrence of NAFLD was higher in patients with psoriasis than in controls (18% vs. 8%; p = 0.002).

The other diseases that occurred with psoriasis were hypothyroidism (4%), COPD (1%) and bronchial asthma (0.4%). There was no significant relationship between disease severity and smoking, however those who consumed alcohol had a more severe disease (p=0.03) when compared to controls. There was no relation between BMI and PASI scores. There was also no difference between disease severity and obesity. Obesity was more common in patients with psoriasis who had longer duration of disease.

However there was no significant relation between abdominal obesity and long standing disease. There was also no association between duration of psoriasis and the presence of metabolic syndrome or any of its components. Coronary artery disease did not seem to be related to the duration of psoriasis.

There was no correlation between psoriatic arthritis and metabolic syndrome. The commonest liver disease was NAFLD in both groups which were significantly more frequent among patients with psoriasis. Around one third patients showed evidence of hepatic steatosis on sonography. Of these 50% met the criteria for NAFLD.

DISCUSSION

Psoriasis is a complex, multifactorial disease that appears to be influenced by genetic and immune-mediated components. This is supported by the successful treatment of psoriasis with immune-mediating, biologic medications.

This is a single centre case control study done at department of Dermatology, Venerology & Leprosy of a tertiary care centre of Indore. Three hundred patients with Psoriasis Vulgaris were consecutively enrolled over a period of one year from January 2017 to December 2017. Three hundred patients who attended the skin department for other skin ailments were the controls. Previously conducted studies in India documented subjects with psoriasis who were in the younger age groups when compared to our study. Okhandiar *et al*. collected a comprehensive data from various medical colleges located in Dibrugarh, Calcutta, Patna,

Darbhanga, Lucknow, New Delhi and Amritsar. They found that the highest incidence of psoriasis was in the age group of 20-39 years [14]. Majority of the patients with psoriasis had mild disease and the mean PASI score was 6.23 in our study. In a study by Gisondi *et al*. 57.3% had mild disease and 42.7% had severe disease (PASI> 10)[7].

Smoking was seen significantly in patients with psoriasis in our study and this could be secondary to the increased prevalence of psoriasis among men. Huerta et al conducted a prospective follow up study in a cohort which showed that patients with psoriasis were more likely to be current smokers (OR, 95% CI- 1.5, 1.3-1.6) compared with controls [15].

In 2006 Mallbris *et al.* discussed the metabolic disorders in patients with psoriasis and psoriatic arthritis [5]. In the same year Sommer DM *et al.*, showed that MetS was more prevalent in psoriatic patients [6]. He included a total of 581 adults hospitalised for chronic plaque psoriasis and compared them with 1,044 hospital-based controls. A distinct pattern of chronic disorders was found to be significantly associated with psoriasis, including diabetes mellitus type II [odds ratio (OR)=2.48], arterial hypertension (OR = 3.27), hyperlipedemia (OR = 2.09), and coronary heart disease (OR = 1.95). The combined presence of these conditions together with obesity, known as the metabolic syndrome, was clearly more prevalent in patients with psoriasis (OR = 5.29)[6].

In our study we found that there is a common tendency for dyslipidemias in patients with psoriasis when compared with controls. Veetil BMA *et al.* conducted a retrospective study encompassing 963 subject records in Olmsted country, including subjects aged over 35 years to analyse the trend of the lipids in psoriatic patients on management for dyslipidemia. High-density lipoprotein (HDL) levels increased significantly both before and after psoriasis incidence date in the psoriasis cohort. Triglyceride (TG) levels were significantly higher (p<0.001), and HDL levels significantly lower (p=0.013) in patients with psoriasis compared to non-psoriasis subjects. There were no differences in prescriptions for lipid lowering drugs

between the two cohorts thus emphasizing that there is no resistance to treatment with lipid lowering agents even after onset of psoriasis [16].

Diabetes mellitus prevalence was significantly higher in patients with psoriasis in our study. This significance remained even after adjustment for obesity and smoking. Several recent studies have shown an increased risk of diabetes among patients with psoriasis [17,18]. In a nested case control study by Brauchli *et al*. in which 32,593 patients and 32,856 controls matched on date of the psoriasis diagnosis, age, sex, general practice, and years of history showed an adjusted OR for patients with > 2 years disease duration and >2 prescriptions per year for oral psoriasis treatment was 2.56 (95% CI 1.11-5.92). In an analysis restricted to patients with normal BMI, the adjusted OR was 2.02 (95% CI 1.31-3.10).

A large population based study found an increased relative risk of myocardial infarction especially in patients with severe psoriasis [20]. Consistent with our study in which patients with psoriasis had more prevalence of coronary artery disease compared to controls.

Severity of psoriasis and comorbidities

Although we noticed an increase in the number of smokers in our study we did not find any correlation between the severity of psoriasis and smoking.

There has been varying findings on the relationship between the psoriasis severity and the presence of metabolic syndrome. A Korean study has shown that metabolic syndrome was significantly more prevalent in patients who had moderate and severe disease [21]. Diabetes had a similar distribution in patients with mild and severe psoriasis in our study.

However in a recent population -based cohort study by Azfar *et al*. reported that incident diabetes was linked to psoriasis severity (overall psoriasis: HR- 1.18; 95% CI- 1.14-1.23)[22].

In a cross-sectional study by Neimann *et al*. in which 127,706 patients with mild psoriasis and 3,854 patients with severe psoriasis were included, they found that patients with severe psoriasis had higher occurrence of hypertension when compared to patients with mild psoriasis OR= 1.16, (95% CI-1.14-1.18)[24]. On the contrary, in our study there was no relationship between severity of psoriasis and occurrence of hypertension.

There was no relationship between the severity of psoriasis and obesity indicating that even those patients with mild psoriasis were prone to obesity. The severity correlated with the occurrence of cardio vascular events in our study. Several studies have shown an increased occurrence of myocardial infarction in more severe psoriasis [24].

Our study found that NAFLD was associated with the severity of psoriasis and psoriatic arthritis. The patients with psoriasis had a more severe NAFLD when compared to controls. This is similar to an earlier study by Miele *et al*. [8].

CONCLUSION

Psoriasis is a chronic, hyper-proliferative skin diseases; which is difficult to treat and is associated with life threatening co morbidities. In our study there was a significant association between psoriasis and occurrence of MetS and its components like insulin resistance, hypertriglyceridemia, abdominal obesity, hypertension and raised fasting blood Glucose.

There was no relationship between disease severity, duration and presence of psoriatic arthritis and the occurrence of MetS indicating that metabolic comorbidities may be present even in mild psoriasis. Therefore we propose that all psoriatic patients must be screened for cardiovascular risk factors and their predecessors i.e the metabolic disturbances, at the disease onset itself irrespective of severity and duration, especially those where systemic therapy is being considered or where there is a strong family history of vascular accidents.

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