Section: Dermatology

Original Research Article

A HOSPITAL BASED PROSPECTIVE STUDY TO ASSESS THE PREVALENCE OF NONALCOHOLIC FATTY LIVER DISEASE AND METABOLIC SYNDROME IN PSORIASIS IN A TERTIARY HEALTH CENTER

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Abstract

Background: Psoriasis is a multifactorial, multisystem disease, resulting from interplay of genetic and environmental factors, causing dysregulation of innate and adaptive immune system. It is hypothesised that components of metabolic syndrome as the most likely pathogenic basis may play a role in the manifestation of NAFLD and psoriasis. The aim of this study to assess the prevalence of nonalcoholic fatty liver disease and metabolic syndrome in psoriasis in a tertiary health center. **Materials and Methods:** This is a hospital-based study done on 100 psoriasis patients. Psoriasis patients on hepatotoxic drugs, significant alcohol use was excluded from the study. After clinical history and examination all the patients are subjected to battery of investigations including ultrasonography. Data collected for each patient included demographics (age and sex); characteristics of psoriasis (age at onset and history of treatment); and diagnosis of NAFLD or a related metabolic disease (NAFLD, diabetes, hypertriglyceridemia, hyperuricemia, and metabolic syndrome). **Result:** The participants were largely middle aged (44.82 ±11.90) and the majority were overweight (25.73 ±3.62 kg/m2) and male (68%). More than two thirds of the participants (70%) met the criteria for diagnosis of metabolic syndrome based on NCEP – ATP III. Psoriasis patients with NAFLD were younger than patients with psoriasis alone, more obese when compared to non-NAFLD patients with psoriasis, more likely to be male and had higher levels of BMI. They also had greater frequency of metabolic syndrome when compared to psoriasis with non-NAFLD and the majority of NAFLD patients had higher serum ALT concentrations. Notably, compared with psoriasis patients with NAFLD had a more severe form of psoriasis than with non-NAFLD according to PASI score (mean ± SD: 31.82 ±13.60 vs. 23.27 ±12.06; $p < 0.05$*). Fibrosis scores of NAFLD patients with psoriasis were higher than non-NAFLD patients with psoriasis. **Conclusion:** Psoriatic patients with metabolic syndrome should be educated about lifestyle modifications and they should be administered cardio protective drugs along with the psoriasis medications. Psoriatic patients should be regularly screened for diabetes, atherosclerosis, and liver disease.

INTRODUCTION

Psoriasis vulgaris as the name implies is a common dermatological condition, worldwide with a prevalence of 1.5%-3%.[1] A study in India quotes a higher prevalence of 0.8-5.6%,[2] as environmental factors play a role with countries at greater latitudes from equator have a higher prevalence. It is now recognized that psoriasis is not just skin deep, and psoriasis patients suffer with many systemic illnesses directly or indirectly. Various studies across the world have demonstrated a chronic systemic inflammatory state of psoriasis which predisposes these patients to a higher relative risk of several comorbidities affecting almost all the system of the body .it is well known that psoriasis patients have a higher prevalence of coronary artery disease and suffer early mortality.[3]

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Psoriasis is a multifactorial, multisystem disease, resulting from interplay of genetic and environmental factors, causing dysregulation of innate and adaptive immune system.

Psoriasis is a chronic inflammatory disease that affects the skin. Studies have shown that psoriasis is not merely a skin problem; psoriasis is linked with various comorbid conditions, especially obesity and metabolic syndrome,[4-8] which are known risk factors for non-alcoholic fatty liver disease (NAFLD). In the past decade, many studies have drawn attention to comorbid conditions in psoriasis, and preliminary epidemiological data suggest that psoriasis could be associated with the development of NAFLD. Non-alcoholic fatty liver disease includes a spectrum of conditions that range from simple fatty liver, which is relatively benign, to non-alcoholic steatohepatitis (NASH), which can give rise to fibrosis, cirrhosis, and end-stage liver disease.[9] Moderate or severe conditions of psoriasis have a high prevalence of chronic liver disease.[10] It is hypothesised that components of metabolic syndrome as the most likely pathogenic basis may play a role in the manifestation of NAFLD and psoriasis.

MATERIALS AND METHODS

A hospital based prospective study done on 100 Patients with an age of above 18 years and with a clinical diagnosis of psoriasis vulgaris, who were outpatients at the Department of Dermatology, Government Medical College, Barmer, Rajasthan, India were recruited for the study over a period one-year period. We excluded patients who were currently on treatment and also those who received methotrexate, cyclosporine, acitretin, psoralens, or systemic steroids 30 days prior to the day of testing. Subjects who had known documented chronic liver disease (alcohol abuse, hepatitis B or C, haemochromatosis, Wilson disease, autoimmune hepatitis, primary biliary cirrhosis, primary sclerosing cholangitis or hepatic malignancy), human immunodeficiency virus (HIV), clinical evidence of malignancy, or other secondary causes of chronic liver disease were also excluded.

Methods: We defined patients with moderate to severe psoriasis as those with a Psoriasis Area and Severity Index (PASI) score of more than 10 and with a body surface area (BSA) involvement of more than 10%, and/or receiving systemic treatment (MTX, acitretin, biologics) in our hospital over the past 3 years.

Data collected for each patient included demographics (age and sex); characteristics of psoriasis (age at onset and history of treatment); and diagnosis of NAFLD or a related metabolic disease (NAFLD, diabetes, hypertriglyceridemia, hyperuricemia, and metabolic syndrome).

Diabetes diagnosis was defined as a fasting blood glucose greater than or equal to 6.1 mmol/L or reported use of oral glucose-lowering medication or insulin. Hypertriglyceridemia was defined as serum triglycerides greater than or equal to 1.7 mmol/L. NAFLD was diagnosed using abdominal ultrasonography performed by certified and experienced technicians. Patients with any of the following possible secondary causes of fatty liver disease were excluded. Hyperuricemia was defined as a serum urate level greater than 7.0 mg/dL for men and greater than 6 mg/dL for women.

Metabolic syndrome was defined, according to Adult Treatment Panel III criteria, as the presence of at least 3 of the following 5 traits11: (1) waist circumference greater than 90 cm in men or greater than 80 cm in women within the Indian population; (2) serum triglycerides greater than or equal to 1.7 mmol/L or drug treatment for elevated triglycerides; (3) serum high-density lipoprotein cholesterol less than 1.03 mmol/L in men and less than 1.3 mmol/L in women or drug treatment for low high-density lipoprotein cholesterol; (4) blood pressure greater than or equal to 130/85 mmHg or treatment of previously diagnosed hypertension; and (5) fasting plasma glucose greater than or equal to 5.6 mmol/L or drug treatment for elevated blood glucose.

Statistics: Student's t tests and Chi-square or fisher's exact tests were used to test for significant differences in the distributions of continuous and categorical data, respectively. Logistic regression analyses were used to evaluate the relationship between age at onset of psoriasis and metabolic comorbidities within multivariate models. Statistical analysis was performed using SPSS 22.0 software.

RESULTS

The participants were largely middle aged (44.82 ±11.90) and the majority were overweight (25.73 ±3.62 kg/m2) and male (68%). More than two thirds of the participants (70%) met the criteria for diagnosis of metabolic syndrome based on NCEP – ATP III. Psoriasis patients with NAFLD were younger than patients with psoriasis alone, more obese when compared to non-NAFLD patients with psoriasis, more likely to be male and had higher levels of BMI. They also had greater frequency of metabolic syndrome when compared to psoriasis with non-NAFLD and the majority of NAFLD patients had higher serum ALT concentrations. Notably, compared with psoriasis patients with NAFLD had a more severe form of psoriasis than with non-NAFLD according to PASI score (mean ± SD: 31.82 ±13.60 vs. 23.27 ±12.06; $p < 0.05$*) [Table 1]. Fibrosis scores of NAFLD patients with psoriasis were higher than non-NAFLD patients with psoriasis.

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Table 1: Correlation between psoriasis with non-NAFLD and NAFLD.

Characteristics	Psoriasis with NAFLD (n = 52)	Psoriasis with non-NAFLD (n = 48)	P-value
Age	41.63 ±10.68	45.38 ±11.20	>0.05
Gender (male)	39 (75%)	29 (60.41%)	<0.05*
BMI	25.29 ±3.63	24.72±3.82	>0.05
Systolic	121.05 ±13.32	117.95 ±17.80	>0.05
Diastolic	80.76 ±10.42	82.50 ±10.65	>0.05
FBS	122.7 ±22.66	110.24 ±26.20	<0.05*
TGL	240.20 ±110.5	175.22 ±83.42	<0.05*
Cholesterol	215.12 ±40.18	211.2 ±40.8	>0.05
HDL	43.62 ±8.3	42.37 ±9.4	>0.05
LDL	124.66 ±37.3	132.10 ±32.8	>0.05
Obese	7 (13.46%)	6 (12.5%)	>0.05
Metabolic syndrome	43 (82.69%)	31 (64.58%)	0.045
Waist circumference	94.12 ±11.23	88.06 ±14.32	<0.05*
Abdominal obesity	29 (55.76%)	18 (37.5%)	>0.05
Hypercholesterolemia	32 (61.53%)	30 (62.5%)	>0.05
Hypertriglyceridemia	41 (78.84%)	25 (52.08%)	<0.05*
Low HDL	23 (44.23%)	25 (52.08%)	>0.05
Hyperglycemia	35 (67.3%)	20 (41.66%)	<0.05*
Hypertension	30 (57.69%)	27 (56.25%)	>0.05
Diabetes	35 (67.3%)	21 (43.75%)	<0.05*
Elevated ALT	30 (57.69%)	16 (33.33%)	<0.05*
ALT	34.35 ±13.72	26.36 ±11.62	<0.05*
AST	32.12 ±11.27	29.42 ±9.72	>0.05
Fibro Scan	6.72 ±1.9	5.52 ±1.48	<0.05*
PASI	31.82 ±13.60	23.27 ±12.06	<0.05*

DISCUSSION

Psoriasis is a systemic illness involving almost all system in the body. It is a chronic inflammatory state, mediated by T helper cell and its cytokines. The role of adipokines in psoriasis is of recent interest. Various experiments have proved its role in psoriasis. Of the comorbidities, metabolic syndrome is more prevalent among psoriasis patients and is considered as a high risk for developing coronary artery disease. NAFLD is now regarded as the hepatic manifestation of metabolic syndrome. Hence our objective of the study is to find the magnitude of NAFLD and metabolic syndrome among psoriasis patients.

The prevalence of NAFLD among normal population is estimated as 20-30% across various countries. The prevalence of NAFLD in India is reported as 9-19% in adult population.

In our study NAFLD is found in 52 (52%) of the patients. Similar to previous other studies, the prevalence of NAFLD is increased in our study. Gisondi et al,[12] have found a prevalence of NAFLD in 47% of patients with psoriasis. Madanagobalane et al,[13] showed a prevalence of 17.4% in south Indian population.

In our study NAFLD is seen distributed equally in all age group, both the sex, and irrespective of the duration of illness. This is similar to the study by Gisondi et al,[12] in which the prevalence of NAFLD did not vary with age, gender, body mass index, psoriasis duration. Compared to other studies like Gisondi et al,[12] who had observed more prevalence of NAFLD in chronic plaque psoriasis and Madanagobalane et al,[13] study in which they found an association of NAFLD with psoriatic arthritis, we did not find any association with any specific type of psoriasis.

Our psoriasis patients with NAFLD are found to be associated with obesity, dyslipidaemia, and metabolic syndrome in our study. Other studies have reported similar observation. This is probably due to a similar pathogenesis which is common to both psoriasis and NAFLD. Adipocytokines have a role in psoriasis as well as NAFLD. Hypoadiponectinemia is associated with psoriasis.

The previously well-described risk factors for NAFLD include metabolic syndrome and lifestyle habits, such as fructose consumption and physical activity level, which impact disease severity.[14] Recent reports have shown that people with psoriasis may be at greater risk for developing of NAFLD.[15] Non-alcoholic fatty liver disease is one such disease that now has potentially enormous public health consequences due to its progression to more severe forms of the disease ranging from steatosis to steatohepatitis (NASH), which, in turn, can progress into cirrhosis and end stage liver disease and finally the need for liver transplantation. The increasing incidence of NAFLD throughout world has contributed to rising numbers of HCC incidents.[16] There is also evidence suggesting that NAFLD individuals are at risk of developing cardiovascular events independently of conventional risk factors and metabolic syndrome components.[17]

It is reported that metabolic syndrome is more common in psoriasis patients.18 We found higher rates of metabolic syndrome among NAFLD than non-NAFLD patients with psoriasis. However, our major finding in this study was that psoriasis with NAFLD was positively correlated with three components of metabolic syndrome: hyperglycaemia, hypertriglyceridemia, and abdominal obesity, but significant correlation was not observed with hypertension and low level of HDL in univariate

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logistic regression analysis, although the levels of HDL and blood pressure were reported to be higher in psoriasis patients with NAFLD than in those with non-NAFLD. Although obesity is reported to be highly prevalent among psoriasis patients, we did not find significant correlation between BMI and NAFLD in psoriasis patients. However, we observed a higher number of obese among psoriasis with NAFLD patients than non-NAFLD psoriasis patients. This may be explained by which concluded that the predominant of our psoriasis patients were overweight.

In our study we observed that ALT was increased in psoriasis patients with NAFLD and highly associated with psoriasis. We did not detect any significant as- sociation of NAFLD in other liver function tests in our psoriasis patients. Our study found that DM was com- mon in psoriasis patients. We also found that hypercholesterolaemia was not associated with NAFLD patients with psoriasis even though TGL was highly significantly associated with NAFLD patients with psoriasis.

CONCLUSION

Psoriatic patients with metabolic syndrome should be educated about lifestyle modifications and they should be administered cardio protective drugs along with the psoriasis medications. Psoriatic patients should be regularly screened for diabetes, atherosclerosis, and liver disease.

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