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RESEARCH ARTICLE

PREVALENCE OF NON-ALCOHOLIC FATTY LIVER DISEASE IN ADULT PSORIATIC PATIENTS: A HOSPITAL BASED STUDY FROM NORTH INDIA

***,[1]Seema Qayoom, [2]Majid Jehangir and [3]Rahil Yousuf**

[1]Associate Professor, Department of Dermatology, SKIMS Medical College, Srinagar, J&K, India
[2]Professor, Department of Radio-Diagnosis and Imaging, Govt. Medical College, Srinagar, J&K, India
[3]Registrar, Department of Radio-Diagnosis and Imaging, Govt. Medical College, Srinagar, J&K, India

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ABSTRACT

Introduction: Psoriasis, a chronic inflammatory skin disease, is associated with many co-morbidities including metabolic syndrome. Non-alcoholic fatty liver disease (NAFLD) is one of the hepatic manifestations of metabolic syndrome. A few recent studies have shown that NAFLD is also frequent in psoriatic patients.

Aim: The aimof the study was to analyze the prevalence of NAFLD among adult psoriatic patients.

Material & Methods: 250 adult psoriatic patients who presented to Department of Dermatology were enrolled in the study. All the patients underwent a dedicated skin examination, abdominal sonography and fasting blood workup.

Results: The overall prevalence of NAFLD among adult psoriatic patients was 46.8% in our study, while as the overall prevalence of NAFLD in India is between 9 and 19% in adult population. Thus, the prevalence of NAFLD in psoriatic patients is more than 2.5 fold higher. Also psoriatic patients with NAFLD had more severe disease as per psoriasis area and severity index (PASI) scores.

Conclusion: Our findings suggests that NAFLD is more frequent in psoriatic patients and is also associated with severity of disease as per PASI score.

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INTRODUCTION

Psoriasis is a chronic, immune-mediated inflammatory skin disease that affects 1-4% of general population (Griffiths, 2007). Although primarily a skin disease, psoriasis is associated with many co-morbidities like diabetes, obesity, metabolic syndrome, cardio-vascular disease, inflammatory bowel disease, uveitis, depression and malignancy (Boehncke, 2014; Campanati, 2012 and Ryan, 2015). Both obesity and metabolic syndrome are risk factors for development of non-alcoholic fatty liver disease (NAFLD). NAFLD is characterized by accumulation of triglycerides within the hepatocytes and includes a spectrum of conditions ranging from non-alcoholic fatty liver to non-alcoholic steato-hepatitis (NASH), cirrhosis and hepato-cellular carcinoma (Adams, 2005). In 2001, Lonardo was first to report three cases of psoriasis having NAFLD (Lonarda, 2001). Vilarrasa et al showed that patients with severe psoriasis have a higher prevalence of cirrhosis (Vilarrasa, 2014). In Rotterdam study (Van der Voort, 2014), a prospective population- based cohort study, psoriasis was found to be independently associated with 70% increased likelihood of NAFLD.

Corresponding author: **Seema Qayoom,**
Associate Professor, Department of Dermatology, SKIMS Medical College, Srinagar, J and K, India.

At present there are very few studies showing high prevalence of NAFLD in psoriatic patients (Candia, 2015; Lee, 2015 and KrishnasamyNarayanasamy, 20161). We, therefore, undertook the study to analyze if there is an increased prevalence of NAFLD among adult psoriatic patients in the Indian context.

MATERIALS AND METHODS

250 adult patients with clinical diagnosis of psoriasis vulgaris who presented to the Department of Dermatology of SKIMS, Medical College, Srinagar between July 2014- March 2017 were included in the study. Patients who were already on treatment for psoriasis and patients with chronic liver disease (hepatitis B or C, haemochromatosis, Wilson disease, alcohol abuse, autoimmune hepatitis, primary biliary cirrhosis, primarysclerosing cholangitis) were excluded from the study. Informed written consent was obtained from all the patients and the study was approved by institutional ethical committee.

Sample size was determined by keeping the prevalence of NAFLD as 19% (prevalence reported in previous Indian studies) (Amarapurkar, 2007). All the patients were subjected to detailed history and clinical examination. The history included the duration of disease, alcohol intake, joint pains, presence of various systemic illness especially diabetes,

hypothyroidism, and drug intake. Besides routine clinical examination, patients body mass index (BMI) was determined from height and weight using the following formula: (BMI) = weight in kg/height in meters square. The waist circumference was measured at the levels of iliac crests. The diagnosis of psoriasis was made clinically by an experienced Dermatologist and the patients were classified according to the International classification of Diseases 10th Rev. (World Health Organization). The severity of disease was assessed using psoriasis area and severity index (PASI) (Van de Kerhot, 1992). The PASI score ranges from 0 to 72 depending on erythema, induration and scaling of lesions in four body areas (head, trunk, arms and legs). Psoriasis severity was classified as PASI <10 and PASI>10 (Finlay, 2005). Besides routine investigations, all the patients underwent the following laboratory tests after overnight fasting. Liver function tests (LFT) comprised of serum levels of total bilirubin, aspartate aminotransferase (AST), alanine aminotransferase (ALT), gamma-glutamyltransferase (GGT) and alkaline phosphatase. Lipid profile included total cholesterol, low density lipoprotein (LDL), high density lipoprotein (HDL) and total triglyceride levels. Serum glucose levels were also done in all the patients. Ultrasonography was performed on GE Logic S-8 by an experienced radiologist who was blinded to the patients particulars.Sonologic diagnosis and grading of fatty liver was made on basis of following characteristic features.

Grade I: Increased hepatic echogenecity with visible periportal and diaphragmatic echogenecity.

Grade II: Increased hepatic echogenecity with imperceptible periportalechogenecity without obscuration of diaphragm.

Grade III: Increased hepatic echogenecity with impercepatibleperiportalechogenecitywith obscuration of diaphragm.

Those patients who had increased liver echogenecity on ultrasonography and elevated liver enzymes further underwent the following laboratory investigations: Serology for hepatitis B and hepatitis C, anti-nuclear antibody, fasting transferrin saturation, Alpha-1 antitrypsin and ceruloplasmin levels (to exclude patients with hepatitis and various congenital hepatic diseases).

NAFLD was diagnosed clinically by

- Sonologic evidence of fatty liver
- Mild to moderately elevated liver enzymes.
- Abnormal lipid profile.

Metabolic syndrome (MS) was diagnosed using South Asian Modified National Cholesterol Education Program Adult Treatment Panel III (Report of a WHO, 2006). Statistical analysis was performed using SPSS software (version 17.0). Data was expressed as mean ± standard deviation for continuous variables and as numbers and percentages for categorical variables.p values <0.05 were considered statistically significant.

RESULTS

The study included 250 adult psoriatic patients who presented to Department of Dermatology between July 2014 and March 2017. The characteristics of the psoriatic patients are given in Table I. The mean age of patients was 39.7 ± 9.8 years. 60.4% patients were male. Mean BMI was 26.9±5.74. Most (87.6%) of the patients had mild psoriasis (PASI<10). Metabolic syndrome was seen in 39.2% patients and 29.6% patients were diabetic. 117 (46.8%) patients had sonologic evidence of fatty liver with raised transaminase levels, out of which one patient had cirrhosis. Thus the overall prevalence of NAFLD in adult psoriatic patients was 46.8% in our study. Psoriatic patients with NAFLD had a more severe form of psoriasis than those without NAFLD according to PASI score (mean ±SD 30.88± 15.54 vs 21.10± 11.05; P<0.0001).

Table 1. Characteristics of Psoriasis Patients *(n=250)*

Characteristics	Value
Age	
Range (years)	19-64
Mean±SD (years)	39.7± 9.8
Male (n%)	151 (60.4%)
Body Mass Index (kg/m2)	
Range	16.04 - 41.61
Mean±SD	26.9±5.74
Psoriasis Type	
Chronic plaque Psoriasis (n%)	129(51.6%)
Pustular Psoriasis (n%)	30(12%)
Palmoplantar Psoriasis (n%)	39 (15.6%)
Scalp Psoriasis (n%)	31(12.4%)
Psoriatic arthritis (n%)	21 (8.4%)
Duration (years)	5.24±3.19
Psoriatic Area and Severity Index (PASI)	
Range	0.8-46.6
Mean ±SD	5.18±7.01
PASI >10 (n%)	31 (12.4%)
PASI<10 (n%)	219 (87.6%)
Metabolic Syndrome (n%)	98(39.2%)
Hypercholesterolemia (n%)	81 (32.4%)
Hypertriglyceridemia (n%)	112 (44.8%)
Diabetes (n%)	74 (29.6%)
Transaminase elevation (n%)	117 (46.8%)
Liver Sonography	
Normal (n%)	132 (52.8%)
Fatty Liver (n%)	117 (46.8%)
Grade I (n%)	61 (24.4%)
Grade II (n%)	31 (12.4%)
Grade III (n%)	25 (10%)
Cirrhosis (n%)	1(0.4%)

DISCUSSION

Psoriasis, although primarily a skin disease, is associated with various co-morbidities including obesity, metabolic syndrome and diabetes which are known risk factors for NAFLD. The pathogenesis of diabetes, metabolic syndrome and NAFLD are linked to insulin resistance and hyperinsulinaemia. The pathogenic relation between NAFLD and psoriasis seems to be multi factorial and complex. It could be speculated that low, chronic inflammation and peripheral insulin resistance which occurs in both these conditions may be the linking factors. Cytokine activation due to inflammatory state has been shown to play an important role in pathogenesis of both these disorders. Therefore, one expects an increased prevalence of NAFLD in psoriatic patients. We conducted the present study to determine the prevalence of NAFLD in adult psoriatic patients in our region. The study revealed 46.8% prevalence rate of NAFLD in psoriatic patients. This is more than 2.5 fold higher compared with the previous reported 9-19% prevalence of NAFLD in adult population in India (Amarapurkar, 2007). Our study, however, has few limitations. First limitation of the study is that we did not have age, sex and BMI related control group in our study. Secondly, we did not perform liver biopsies to confirm the diagnosis and severity of fatty liver as it would have been unethical to do so. To conclude, our study shows that NAFLD is more frequent in psoriatic patients and is

also associated with severity of disease as per PASI score. So we suggest that NAFLD be ruled out in all psoriatic patients especially when systemic therapy is being considered as some of the drugs used for treatment of psoriasis (e.e. acitretin, methotrexate and ciclosporin) are hepatotoxic.

Conflict of Interest: *None to declare*

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