Prevalence of Liver Fibrosis in Adult Psoriatic Patients using Transient Elastogram (Fibroscan): A Hospital based Study

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ABSTRACT

Introduction: Psoriasis, a chronic inflammatory skin disease, is associated with many co- morbidities including metabolic syndrome and non-alcoholic fatty liver disease (NAFLD). NAFLD can progress to non-alcoholic steatohepatitis (NASH), liver fibrosis and cirrhosis. Recent studies have shown that liver fibrosis is frequent in psoriatic patients. The aim of the study was to analyse the prevalence of liver fibrosis among adult psoriatic patients.

Material and Methods: 170 adult psoriatic patients who presented to Department of Dermatology were enrolled in the study. All the patients underwent a dedicated skin examination, fasting blood tests, abdominal Sonography and Transient Elastography (TE) for liver.

Results: In adult psoriatic patients, the prevalence of significant liver fibrosis was 9.4% and prevalence of advanced liver fibrosis was 7.2% in our study.

Conclusion: Our study shows that liver fibrosis is more frequent in psoriatic patients as compared to the reported prevalence in general population.

Keywords Psoriasis, Non Alcoholic Fatty Liver Disease (NAFLD), and Transient Elastography (TE), Fibroscan.

INTRODUCTION

Psoriasis is a chronic inflammatory skin disease affecting 1-4% of general population (Griffiths, 2007).[1] It is associated with various co-morbidities including obesity, diabetes, non alcoholic fatty liver disease (NAFLD) and metabolic syndrome (Boehncke, 2004; and Seema, 2007).[2,3] NAFLD is characterized by accumulation of triglycerides within the hepatocytes and encompasses conditions ranging from simple fatty liver, to non alcoholic steato-hepatitis (NASH), cirrhosis and hepato-cellular carcinoma (Adams, 2005).[4] In a prospective population- based Rotterdam study (Van der Voort, 2014)[5], psoriasis was found to be independently associated with 70% increased risk of NAFLD. At present there are few studies from India showing high prevalence of liver disease in psoriatic patients (Krishnasamy 2016, Seema 2017).[6,3] Most of these studies have used sonologic evidence of fatty liver with mild to moderately elevated liver enzymes and abnormal lipid profile for diagnosing liver involvement in these patients. Liver biopsy is the gold standard for assessing the severity of liver fibrosis (Brunt, 1999).[7] However it's invasive nature limits its use in routine practice. Transient elastography (Fibroscan) is a non invasive tool that has been used for assessment of liver fibrosis in various liver diseases including psoriasis.(Berends 2007 and Lynch 2014).[8,9] We, therefore, undertook the present study to know the prevalence of liver fibrosis in adult psoriatic patients by using transient Elastography (Fibroscan). A fine correlation has been found between significant liver fibrosis (F2 according to the Metavir histological grade) and transient elastography (Fibroscan) (Castera 2005 and Foucher 2006).[10,11] Till date, the prevalence of fibrosis in Indian patients with psoriasis has not been studied, to the best of our knowledge.

MATERIAL AND METHODS

170 adult patients with clinical diagnosis of psoriasis vulgaris who presented to the department of Dermatology of SKIMS Medical College, Srinagar, Jammu & Kashmir, India between July 2015-July 2018 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, primary biliary cirrhosis, autoimmune hepatitis, oriental cholangiohepatitis, primary sclerosing cholangitis) were excluded from the study. Informed written consent was obtained from all the patients and the study was approved by institutional ethical committee. All the patients were subjected to detailed history which included duration of psoriasis, any systemic diseases, co-morbidities, drug intake and heavy alcohol drinking (>20 gm/ day). Clinical diagnosis of psoriasis was made by an experienced dermatologist and patients were classified according to the International classification of diseases 10th Rev. (World Health Organisation). Psoriasis area and severity index (PASI) (Van de Kerhot, 1992)[12] was used to assess the severity of disease. Depending on erythema, induration and scaling of the lesions in four body areas (head, trunk, arms and legs), PASI score was assigned. Severity of disease was classified as PASI<10 and PASI>10 (Finlay, 2005).[13]

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Patient's body mass index (BMI) was determined from height and weight using the following formula: (BMI= weight in kg/height in meter square). Waist circumference was measured at level of iliac crests in all the patients. Fasting blood tests including liver function tests, lipid profile and glucose were collected in all the patients. Ultrasonography for evidence of fatty liver and its grading (I-III) was done in all the patients by an experienced radiologist. When the echogenicity of the liver is increased as compared to the renal cortex, it is fatty liver grade I; when the walls of portal vein branches are obscured by the echogenic liver, it is grade II, and, when the diaphragmatic outline is obscured by the echogenic liver, it is grade III fatty infiltration.[21]

Metabolic syndrome (MS) was diagnosed using South Asian Modified National Cholesterol Education Program Adult Treatment Panel III (Report of WHO, 2006). Transient Elastography (TE)(Fibroscan) was used to assess liver stiffness in all the patients. TE was done after at least 4 hours of fasting by a single experienced operator who was blinded to the patient laboratory and sonography results. TE was performed on right lobe of liver with patient on dorsal decubitus position and right arm abduction, through an intercostal space. Measured depth of liver was 25-65 mm. TE results with 10 validated measurements, interquartile range/ median of <30% and success rate of >60% were considered acceptable (Castera, 2005)[10] and the results were expressed in kilopascals (kPa). Liver stiffness measurement (LSM) < 7kPa was taken as normal, LSM > 9.5 kPa was taken as presence of advanced liver fibrosis and LSM>13kPa was taken as presence of cirrhosis according to previous studies of TE in NAFLD and chronic liver diseases (Friedrich 2008 and Van der Voort 2015).[14,5]

Sample size was determined by keeping the prevalence of NAFLD as 19% (prevalence reported in previous Indian studies) (Amarapurkar, 2007).[15] Statistical analysis was performed using SPSS software (version 17.0). Data was expressed as mean ±SD for continuous variables and as numbers and percentages for categorical variables. p value <0.05 was considered statistically significant.

RESULTS

The study included 170 adult psoriatic patients who presented to the Department of Dermatology between July 2015 and July 2018. The characteristics of psoriatic patients are given in Table I. The mean age of patients was 38.5 ±8.9 years and 64.1% patients were males. Mean BMI was 21.9 ± 4.71. Most (87.7%) of the patients had mild psoriasis (PASI<10). 22.3% patients were diabetic and 42.3% had metabolic syndrome. NAFLD was diagnosed in 46% patients and one patient (0.5%) had cirrhosis based on sonologic findings. Sonography of the liver was normal in 91 (53.5%) patients. TE was normal (LSM< 7kPa) in 141 (82.9%) patients. 16 (9.4%) patients had significant liver fibrosis on TE defined as LSM>7 kPa and 12 (7.2%) patients had advanced liver fibrosis defined as LSM> 9.5 kPa while as 1 (0.5%) patients had LSM >13 kPa suggestive of cirrhosis.

Characteristics	Value
Age	
Range (years)	21-58
Mean ±SD(years)	38.5±8.9
Male (n%)	109 (64.1%)
BMI (kg/m^2)	
Range	16.1-40.62
Mean±SD	21.9±4.71
Psoriasis Type	
Chronic plaque psoriasis (n%)	88 (51.7%)
Pustular psoriasis (n%)	19 (11.2%)
Palmopustular psoriasis (n%)	28 (16.6%)
Scalp psoriasis (n%)	25 (14.7%)
Psoriatic arthritis (n%)	10 (5.8%)
Duration (years)	4.81 ±3.51
PASI	
Range	0.7-47.5
Mean ±SD	6.18± 6.10
PASI>10 (n%)	21 (12.3%)
PASI<10 (n%)	140 (87.7%)
Metabolic syndrome (n%)	72 (42.3%)
Hypercholesterolemia (n%)	78 (45.9%)
Hypertriglyceridemia (n%)	82 (48.2%)
Diabetes (n%)	38 (22.3%)
Transaminase elevation (n%)	88 (51.7%)
Ultrasound liver	
Normal (n%)	91 (53.5%)
Fatty liver (n%)	78 (46%)
Grade I (n%)	60 (35.3%)
Grade II (n%)	11 (6.5%)
Grade III (n%)	7 (4.2%)
Cirrhosis (n%)	1 (0.5%)
TE liver	
Normal (n%)	141 (82.9%)
Fibrosis (n%)	29 (17.1%)
Significant fibrosis (n%)	16 (9.4%)
Advanced fibrosis (n%)	12 (7.2%)
Cirrhosis (n%)	1 (0.5%)

Table-1: Characteristics of psoriatic patients (n=170)

DISCUSSION

Psoriasis, although primarily a skin disease, is associated with various co-morbidities including metabolic syndrome, NAFLD and diabetes which are known risk factors for liver fibrosis. The pathogenic relation between liver fibrosis and psoriasis seems to be multifactorial and complex. Many techniques have been used to allow early and reliable diagnosis of liver fibrosis. Liver biopsy is till the gold standard. However, it is an invasive procedure and its accuracy in assessing fibrosis is limited owing to sampling error and interobserver variability. Recently, Transient Elastography (TE), a non-invasive technique, has been used to assess liver fibrosis and a fine correlation has been formed between significant liver fibrosis (F2 according to Metavir histological grade) and TE (Castera 2005 and Foucher 2006).[10,11] Various studies have shown that TE in psoriatic patients had a 100% sensitivity for significant liver fibrosis but only 67% specificity (A. Bray et al 2012 and B. Kaffenberger 2015).[16,17] So we conducted the present study

to determine the prevalence of liver fibrosis in adult psoriatic patients using TE. In the present study, 9.4% patients had significant liver fibrosis on TE, defined as LSM> 7kPa. This is slightly less compared to the previous studies (12-27%) (Rosenberg et al 2007; Brunt et al 1999; Chalmer's et al 2005 and Berends et al 2007).[18,7,19,8] 7.2% of patients in our study had advanced liver fibrosis on TE, defined as LSM >9.5 kPa. This is also slightly less as compared to a recent study (7.2% versus 8.1%) (Van der Voort 2015).[5] Our study, however, has a few limitations. It is a single center study and liver biopsy which is a gold standard tool for liver fibrosis assessment, was not performed in our study. As such larger studies are required for confirmation of our findings. To conclude, our study shows that the prevalence of significant and advanced liver fibrosis in adult psoriatic patients is higher than reported prevalence of 6% and 4% respectively in general population (Caballeria Let al, 2018).[20] So we suggest that TE, a non invasive test should be performed in all psoriatic patients to exclude liver fibrosis especially in psoriatic patients with metabolic syndrome, obesity and diabetes mellitus and also before starting systemic therapy, as some of the drugs used for treatment of psoriasis (e.g. acitretin, methotrexate and ciclisporin) are hepatotoxic.

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