FREQUENCY OF OSTEOPOROSIS IN PATIENTS WITH CIRRHOSIS DUE TO HEPATITIS B AND HEPATITIS C: A STUDY OF 100 CASES

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Background: Osteoporosis is the disease of bone that affected King David of Israel 3000 years ago. This condition is no longer considered to be due to aging alone and is increasingly recognised as a major health concern and accounts for about 1.5 million fractures annually in United States. Objective of this study was to see the frequency of osteoporosis in patients with cirrhosis due to Hepatitis B and C, and any correlation between the Bone Mineral Density (BMD) and duration and stage of the liver disease. **Methods:** The study was conducted in the Department of Gastroenterology, Postgraduate Medical Institute, Hayatabad Medical Complex, Peshawar, from January 2008 to December 2008. All patients from the OPD or Ward fulfilling the criteria and consenting were included. Physical examination, with special emphasis on any signs of chronic liver disease was performed. Full blood count, platelet count, prothrombin time and INR, liver function tests including serum albumin, and renal function tests were done on all patients. Viral serology was checked for those patients who were either newly diagnosed as cirrhotic or were cirrhotic but not screened for viral markers. Abdominal sonogram was recorded on all patients. The Child's score was calculated for each patient using the clinical and lab parameters. The BMD was calculated for all patients using computer based ultrasound probe. Calcaneum was used for evaluation of BMD. The information collected was entered on structured data collection sheets and was analysed using SPSS version 11. **Results:** Osteoporosis was found in 26% of subject and osteopenia in 42%, while 32% had BMD in the normal range. The mean T score was -1.483 (±1.29). The mean duration of liver disease was 3.77 (±1.56) year. Majority of the patients (81%) were in Child's Class C, followed by Class B and A (16% and 3% respectively). Fifty-nine percent of the patients were males with a mean age of 37.65 years, while 41% were females with mean age of 37.76 years. **Conclusion:** Osteoporosis is a common finding in patients with cirrhosis due to Hepatitis B and C. Osteoporosis is more frequent in patients with long duration of liver disease but there is no significant correlation between the aetiology or severity of liver disease and osteoporosis.

Keywords: BMD, T score, Child's score, Cirrhosis, Hepatitis B, Hepatitis C, Osteoporosis

INTRODUCTION

The WHO definition of osteoporosis depends on measurement of bone mineral density (BMD), defined as BMD of ≥2.5 standard deviations below the mean for young adults (i.e., T score).[1]

It is the disease of the bone that affected King David of Israel 3000 years ago. This condition is no longer considered to be due to aging alone.[2] It is increasingly recognized as a major health concern and account for about 1.5 million fractures annually in United States.[3]

Cirrhosis is chronic debilitating condition associated with significant morbidity and mortality due to various complications. Hepatic osteodystrophy and consequent osteoporosis is a common form of bone disease in patients with chronic liver disease.[4–7] and increased risk of fracture represent some of the recently investigated complications.

The pathogenesis of hepatic osteodystrophy is unclear. Several factors like malnutrition, immobilization and hormonal disturbances are thought to be responsible. These changes are thought to be responsible for deteriorating bone metabolism resulting in disturbance between the osteoclastic and osteoblastic activity. [8–11]

Various studies have shown that osteoporosis in not only common in patients with alcoholic cirrhosis, but also in patients with chronic liver disease due to hepatitis B and C.[5,6,12,13]

Due to improved medical treatment, patients with advanced liver disease are now surviving longer and are thus prone to develop hepatic osteodystrophy and osteoporosis.

Metabolic bone disease is however still under recognized as a cause of morbidity and mortality in patients with cirrhosis and post liver transplant patients. It is therefore important to recognize these patients due to significant prognostic implications.[7,14]

We conducted this study to see the frequency of osteoporosis in patients with cirrhosis due to Hepatitis B and C in our set up.

MATERIAL AND METHODS

One hundred patients with cirrhosis due to either Hepatitis B or C, having age 18 to 50 years were included in the study. Patients visiting the GI

Outpatient Department as well as admitted to the ward were included. Cirrhotic subjects with aetiology other than Hepatitis B and C and/or age below 18 years and above 50 years, patients with history of long term steroid use, and patients having concomitant Hepatocellular carcinoma were excluded form the study.

A detailed physical examination was carried out on all patients and the severity of the disease was assessed by calculating the Child's score. The duration of the disease was also estimated. Bone Mineral Density (BMD) was assessed for each patient using ultrasound impedance across the Calcaneum and calculated by a computer assisted device. The BMD was expressed as T score. The WHO standard value was used to define Osteoporosis (T score ≥ -2.5).

A standard proforma was used for collection of data. All data collected was analysed using SPSS. For continuous variables, percentage, mean and standard deviation was calculated. Categorical data were expressed as number of subjects with specific characteristics. Chi-square test was used for comparing categorical data. Regression analysis was done to find out any correlation between the categorical variables.

RESULTS

Out of 100 patients 59% were males and 41% were females with male to female ratio of 1.44:1. The age range was 18–50 years, with a mean of 37.76 years. Eighty percent of patients were having cirrhosis due to Hepatitis C while 20% were having cirrhosis due to Hepatitis B. Eighty-one percent patients were having Child's class C, 16% class B, and 3% had Child's class A.

Mean duration of the disease was 3.77±1.56 year. Mean T score was -1.48±1.29. Osteoporosis was found in 26% of patients, 42% of patients had osteopenia while 32% of patients had normal BMD. The patients' characteristics are shown in Table-1.

Table-2 outlines the various risk factors and their relation with osteopenea/osteoporosis.

Table-1: Patients' characteristics

Parameters	Mean±SD
Age	37.76
Male Female	59 41
Hepatitis B	20.0%
Hepatitis C	80.0%
Child Class A	3.0%
Child Class B	16.0%
Child Class C	81.0%
Duration of Disease	3.77±1.56
T Score	-1.48±1.29
Osteoporosis	26.0%
Osteopenia	42.0%

Table-2: Correlation between Osteoporosis and various risk factors

Risk factors	Normal BMD	Osteopenia/ Osteoporosis	Total	OR	CI	*p*
Child's class A	2	1	3	–	–	–
Child's class B	6	10	16	1.472	0.413–5.150	0.706
Child's class C	27	54	81			
Hepatitis B	9	11	20	1.69	0.560–5.137	0.431
Hepatitis C	26	54	80			
Cirrhosis ≥ 5 years	9	21	30	3.948	1.444–11.022	0.005
Cirrhosis≤5 years	26	44	70			

DISCUSSION

Osteoporosis and fractures are more common in patients with chronic liver disease as compared to the normal population.

The prevalence of osteoporosis and osteopenia in patients with cirrhosis had been studied by many investigators.

Various studies have reported osteoporosis in 20–50% of patients with cirrhosis due to hepatitis B and C.[8,15]

In our study we found osteoporosis in 26% and osteopenia in 42% of patients with cirrhosis due to viral hepatitis, which is almost comparable with the above mentioned studies. The wide variation in the frequency of osteoporosis in these studies is probably due to the fact that some of them used the femoral heads and others the spinal vertebrae as site for measurement of BMD. Moreover the definition for osteoporosis used was also different, i.e., a T score of -2 in some studies as compared to the WHO standard (T score -2.5) in others.

We found that osteoporosis was more frequent in patients with long duration of liver disease (5 years and above) as compared to those with disease less than 5 years of age (p=0.00513, OR=3.948, CI=1.444–11.022).

Similar observation was made by Rana Paramvir *et al* who reported a positive correlation between the duration of the disease and severity of the osteopenia.[16]

We did not find any significant correlation between the aetiology (Hepatitis B and C) or severity of liver disease and the severity of bone disease. This fact was also demonstrated by Cijevschi *et al* and Rana Paramvir *et al*.[8,16]

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