Vitamin D deficiency in cirrhotics and its relation to fibroscan score, severity of liver disease and bone mineral density

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Background: Vitamin-D deficiency is highly prevalent in cirrhotics. However, data on the relationship between vitamin D deficiency and severity of liver disease in cirrhotics is controversial. Also, it is not known whether vitamin-D deficiency in cirrhotics is associated with low bone mineral density (BMD). This prospective study was planned to assess the relationship between vitamin D deficiency and severity of liver disease, Fibroscan score and bone mineral density in cirrhotics.

Methods: Between November 2011 and August 2012 (10 months), 125 patients of cirrhosis underwent 25-hydroxyvitamin-D (25OHD) levels, Parathyroid hormone (PTH) levels, Fibroscan (Echosens, Paris), dual-energy-X-ray-absorptiometry (DXA) at same time point. Low bone mineral density (BMD) was defined as BMD≥2 standard deviations lower than age, sex, and race-matched controls (Z-score ≤-2.0) at the hip or lumbar spine. Fibroscan was performed according to standard protocol. Child Turcotte Pugh Score (CTP) and Model for End stage Liver Disease (MELD) scores were calculated. Results are expressed as median with 95% confidence interval (CI). Correlation analysis was performed using the Pearson Correlation method.

Results: The median age was 50 years (95% CI, 41-59) and there were 86.4% males. Etiology of cirrhosis was alcohol in 60.8%, alcohol and HCV in 14.4%, HCV in 11.2%, NAFLD/cryptogenic in 11.2%, and HBV in 2.4%. Median CTP and MELD scores were 12 (95% CI, 11-13) and 20 (95% CI, 17-23) respectively. The median Fibroscan score was 48 (95% CI, 44.3-53.9). Fibroscan score showed significant positive correlation with both CTP (r=0.348; p= 0.003) and MELD scores (r=0.525; p=0.000). The median 25OHD value was 23.8 ng/mL (95% CI 18.7-29.5), and hypovitaminosis D (25OHD <20 ng/ml) was present in 60.8% (76/125). The median 25OHD level in patients with alcoholic cirrhosis (22 ng/mL) was not significantly different from those in patients with non-alcoholic cirrhosis (27 ng/mL). Also, there was no significant correlation between 25OHD levels and Fibroscan score (p=0.119), CTP score (p=0.9) or MELD score (p=0.383). The median PTH level was 32.5 (95% CI, 25.8- 41.1). Low BMD (Z-score <-2) at the spine and hip were present in 28.2% and 11.3% respectively. 25OHD levels did not show any significant correlation with PTH (p=0.288) levels or BMD scores (p=0.818).

Conclusion: Vitamin-D deficiency was highly prevalent in north Indian population of cirrhotics but was not related liver disease severity, liver fibrosis, or etiology. Also, there was lack of correlation between 25 OHD levels and bone mineral density or PTH levels.

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