Original Article

Vitamin D Deficiency in Liver Cirhosis

To Determine the Frequency of Vitamin D Deficiency in Patients with Liver Cirhosis

Rubab Kausar[1], Farhana Manzoor[2] and Mujahid Ahmed[3]

ABSTRACT

Objectives: To determine the frequency of vitamin D deficiency in the patients of liver cirrhosis.
Study Design: Observational / descriptive study.
Place and Duration of Study: This study was conducted at the Department of Medicine, DHQ Hospital of MuzaffarGarh from August 2014 to September 2015.
Materials and Methods: Every case of liver cirrhosis was made a part of this study after diagnosis. Severity of the cirrhosis was classified according to child Pugh classification. Severity of vitamin D deficiency was categorized as mild, moderate and severe. Vitamin D level was evaluated through blood sample of every case fromdiagnostic hospital Laboratory
Results: In this study 100 patients were chosen. The number of male was appeared in majority71.0% and mean age was 46.7+7.2years. Mean of alanine aminotransferase was figured as 60+42U/L.HCV infection was the major etiological factor in 53.0% of the cases. Majority of the cases in Child-Pugh's class 'A' 42%. Ascites was almost in all cases. Severe deficiency of the vitamin D was found significantly associated with Pugh grade C in37.5% cases, followed by 26.4% in grade B of and 21.5% in grade A of child Pugh.
Conclusion: Deficiency of vitamin D in cirrhotic patients is big prevalent, and also associated with severity of the cirrhosis.
Key Words: Vitamin D, liver cirrhosis, child Pugh class.

Citation of article: Kausar R, Manzoor F, Ahmed M. To Determine the Frequency of Vitamin D Deficiency in Patients with Liver Cirhosis. Med Forum 2017;28(4):18-21.

INTRODUCTION

Cirrhosis is dangerous and non-reversible disease. It is result ofchronic liver disease distinguished by liver tissue replacement through the fibrotic scar tissues likewise regenerative nodules lead to progression in liver dysfunction.[1] It is a big reason of mortality through the world, also the main reason of death in Pakistani population[2] and leading cause of hospitalization.[3] Development of the cirrhosis is about 10 to 20% during 5 to 30 years. Viral hepatitis is major cause of it in the comparison of west where alcohol consumption is common.[4]

Vitamin D plays significant role in decreasing risk of chronic illnesses; including diabetic Mellitus type II, many types of cancers, autoimmune, cardiovascular and different infectious illnesses. Deficiency of the Vitamin D is much common in cirrhotic cases. More than 93% of CLD cases had vitamin D deficiency.[5] Even the patients having mild liver disease also effected by its deficiency, while liver cirrhotic cases highly affected by severe vitamin D deficiency.

[1.] Department of Medicine, Indus Hospital MuzaffarGarh.
[2.] Department of Medicine, BHU Thatta Qureshi MuzaffarGarh
[3.] Department of Surgery DHQ Hospital MuzaffarGarh

Correspondence: Dr. Mujahid Ahmed, Medical Offiecer, Department of Surgery DHQ Hospital MuzaffarGarh
Contact No: 0313-2851728
Email: dr.saeedarain786@gmail.com

Received: February 19, 2017; Accepted: March 17, 2017

Many general populations based studies showed that decreased level of 25(OH)D remarkably rises the chances of death from all causes as well as CVD.[6] With respect to several etiologies of CLD, vitamin D deficiency also is the one which related with risen mortality, fibrosis severity, portal hypertension, bacterial infections and other severe complications.[7-10] Though, liver plays a vital role in metabolism of vitamin D and pleiotropic functions. Severity of the hepatic disease decreases vitamin Dhydroxylation, albumin and the DBP concentration, and all of these are associated to deceased 25(OH)D level. However, deficiency of vitamin D in the CLD is only partially result of hepatic dysfunction, as evidenced through fact that deficiency of vitamin Dis frequent in the non-cirrhotic cases. In cirrhotic cases concentration of 25(OH) Dcan normalize after treatment of vitamin D, which discloses that 25-hydroxylation is the preserved,[11] and even though DBP decreased moderately in cases having cirrhosis.[12] In CLD cases decreased level of vitamin D is linked with malnutrition and may low exposer sunlight. Liver is distinguished by decrease absorption of vitamin D by intestine and decreased level of the binding protein (albumin and DBP), which transfer the hormones to kidneys and liver in activated order. Additionally liver hydroxylation of vitamin D is reduced and leading to decrease active hormonal production, however vitamin catabolism is raised.[13] Nowadays Pakistan is under the large burden of CLD and cirrhosis. Therefore aim behind this study

was to assess the frequency of decreased vitamin D level in cases having liver cirrhosis.

MATERIALS AND METHODS

This study was carried out in the medicine department of DHQ hospital of MuzaffarGarh. Duration was 14 months as; August 2014 to September 2015. All the cases after diagnosis as cirrhotic patients were incorporated. Cirrhosis was diagnosed on ultrasound abdomen. All the non-cirrhotic cases were not selected. All the selected cases were examined carefully to assess the etiology of illness and its complications at time of presentation and the disease prognosis. All the required and routine laboratory investigations were carried out, along with complete clinical examination. CT scan has been carried out in patient where it is needed. Disease prognosis was evaluated through using modified Child-Pugh's classification, which is graded according to bilirubin level, albumin level, PT, hepatic encephalopathy and ascites and finally classified in three grades as Child-Pugh's A grade, B grade and C grade with score as;<7, 7 to 9 and > 9) respectively. For the assessment of vitamin D concentration blood samples were taken from all the cases and send to Diagnostic lab of Hospital. Level of the vitamin D was categorized as mild = 20–31 ng/ml, moderate =7–19 ng/ml and severe =< 7 ng/ml. All the data was recorded in the proforma.

RESULTS

100 patients were selected for the study andmale gender was in majority 71.0% and 29.0% were female, the mean of age was 46.7**±7.2 years**.Mean of the ALT was found 60±42u/l. HCV infection was major etiological factor in 53.0% of the cases, followed by HBV, HCV+HBV,

Table No.1: Basic data of the patients N=100

Characteristics	No. of cases/ (%)
Age (mean±SD)	46.7**±7.2**
Gender	
Male	71(71.0%)
Female	29(29.0%)
Risk factors	
HCV	53(53.0%)
HBV	12(12.0%)
HCV+HBV	07(07.0%)
Alcohol	09(09.0%)
Fatty liver	14(14.0%)
Unknown	07(07.0%)
ALT (mean±SD)	60±42

Alcohol, Fatty liver and Unknown with the percentage of 12.0%, 07.0%, 09.0%, 14.0% and 07.0% respectively. Table 1.

Majority of the cases in Child-Pugh grade A 42%, followed by Child- Pugh grade B 34.0% and Child-Pugh grade C 24.0%. Table 2.

Ascites was found almost in all cases 95%, while oesophageal varices, GI bleeding, hepatic encephalopathy and HCC were found as 65%, 15%, 17% and 5% respectively. Figure 1.

We found severe vitamin D deficiency in 27 cases out of 100 and it was mostly associated with child Pugh group C 37.5%, followed by 26.4% in child Pugh group B and 21.5% in child Pugh group A. Table 3.

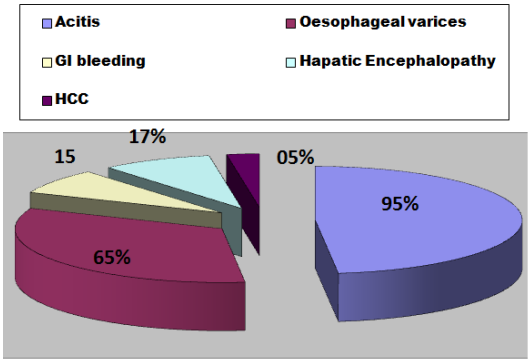

Figure No.1: Morbidities of the patients N=100

Table No.2: Child Pug Classification of the patients N=100

C Child Pug Grades	Frequency/ (%)
Child-Pugh's grade A	42(42.0%)
Child- Pugh's grade B	34(34.0%)
Child-Pugh's grade C	24(24.0%)

Table No.3: Vitamin D deficiency child pug Classification N=100

Vitamin D deficiency	Child-Pugh group		
	Group A n=42	Group B n=34	Group C n=24
Mild (20–31 ng/ml)B	18(42.8%)	13(38.3%)	07(29.1%)
Moderate (7–19 ng/ml)	15(35.7%)	12(35.3%)	08(33.4%)
Severe (>7 ng/ml)	09(21.5%)	09(26.4%)	09(37.5%)
Total	42(100%)	34(100%)	24(100%)

DISCUSSION

The liver Cirrhosis is irreversible disease, and the focus of our treatment is to prevent the progression and to prevent complications among patients. The liver transplantation is the only option in advanced stages of cirrhosis.[14] HCV and liver Cirrhosis is a frequent and common cause of hospitalizations. Within 5yrs-30 years 10-20% patients develop chronic liver disease

and 50% of HCV infected patients develops liver cirrhosis.[15] In our study male gender was in majority 71.0%, while 29.0% were female, the mean of age was 46.7**+7.2 years** and mean of the ALT was found 60+42u/l. In the favour of our study Arteh J et al,[16] shown that mean age of vitamin D deficient patients was 53.2 ± 8.9 years, along with mean of ALT as 60 ± 69. The study of Rahimoon AG et al[17] founded that the mean of age of cases 49.8+6.5years, and mean of ALT was 51+55. In study of Anty R et al,[18] reported that male gender was most common. Similarly Falleti et al,[19] also reported same findings, and reported that male were commonest with chronic HCV infection and vitamin D deficiency. Rahimoon AG et al[18] reported that 60.0% male in comparison with female 40.0%.

In this study HCV infection was the major etiological factor in 53.0% of the cases, followed by HBV, HCV+HBV, Alcohol, Fatty liver and Unknown with the percentage of 12.0%, 07.0%, 09.0%, 14.0% and 07.0% respectively. Similarly Almani SA et al[20] reported that the main causing factor of cirrhosis is HCV infection was in 52% cases. The study of Shah, et al[21] founded that majority of HCV infected patients, presented with developed liver cirrhosis. The study of Bukhtiari, et al[22] founded that 35% of anti-HCV positive and 07% of anti-HCV and HBsAg co-infection as well. Also Farooqui, et al[23] founded that HBs and HCV both were +ve in 3% of whereas patients of HBsAg was positive in 32% patients and anti-HCV was positive in 59% patients. Almani SA et al [20] labeled the increasing stage of cirrhotic patients on the basis of classification of Child-Pugh's and measured 37% had Child-Pugh's prognosis grade A, grade B was in 26% and also 26% of prognosis had Child-Pugh's in grade C. Y N,et al[24] founded that Child-Pugh grade A was in 22% patients. Grade B in 41% and grade C in 36%. Similarly we found majority of the cases in grade 'A' Child-Pugh's that is 42%, grade 'B' Child- Pugh's 34.0% and grade C 24.0%. EdmondoFalleti et al,[19] conducted study on vitamin D in chronic HCV cases and found 46.1% cases had deficiency of vitamin D.

We found severe vitamin D deficiency in 27 cases out of 100 and it was mostly associated with child Pugh group C 37.5%, followed by 26.4% in child Pugh group B and 21.5% in child Pugh group A. On other hand Jevora DI et al,[25] founded that more than 80% HCV infected cases were vitamin D deficient. The study of Mikkel Malham et al,[26] shown 18% of Alcoholic cirrhotic patients had severely decreased vitamin D level. Farniket al[27] founded that among HBV infected cases severe vitamin deficiency was in 34% cases. Arteh J et al,[16] reported that 30.2% cirrhotic patients with HCV were deficient of vitamin D. Comparable results were also found in the study of Mikkel Malham et al.[27] The deficiency of vitamin D was noted to many causes like mal absorption, an impaired hydroxylation of vitamin D in liver, improper diet, decreased production of vitamin D binding protein in liver, and due to decrease exposure to sunlight causing impaired coetaneous production.[28] Also alcoholic patients with cirrhosis founded severe vitamin D deficiency (<10 ng/ml)noted high mortality rate.[29] In cirrhotic patients supplementation of Vitamin D can be beneficial to improve the quality of life and decrease the mortality and morbidity respectively.

CONCLUSION

Deficiency of vitamin D in cirrhotic patients is big prevalent, and also associated with severity of the cirrhosis. Vitamin D insufficiency should be measured and treated as soon as possible in viral hepatitis patients, to decrease its progress and complications. Our research is containing small sample size; more big sample size research is needed.

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Gildea TR, Cook WC, Nelson DR, Aggarwal A, Carey W, Younossi ZM. Predictors of long-term mortality in patients with cirrhosis of the liver admitted to a medical ICU. Am Coll Chest Physicians 2004;126:1598-603
2. Khan AA. Endemic transmission of hepatitis C. J Coll Physicians Surg Pak 1995; 5(1):11–3.
3. Nadeem MA, Waseem T, Sheikh AM, Grumman N, Irfan K, Hasnain SS. Hepatitis C virus: An alarmingly increasing cause of liver cirrhosis in Pakistan. Pak J Gastroenterol 2002; 16(1):3-8.
4. Hussain I, Nasrullah M, Shah AA. Prevalence of hepatitis B and C viral infections in liver cirrhosis in Pakistan. Pak J Gastroenterol 1998;12(1-2):7-
5. Arteh J, Narra S, Nair S. Prevalence of vitamin D deficiency in chronic liver disease. Dig Dis Sci 2010; 55:2624-2628
6. Zittermann A, Iodice S, Pilz S, Grant WB, Bagnardi V, Gandini S. Vitamin D deficiency and mortality risk in the general population: a meta-analysis of prospective cohort studies. Am J ClinNutr 2012;95: 91-100.
7. Trépo E, Ouziel R, Pradat P, Momozawa Y, Quertinmont E, Gervy C. Marked 25-hydroxyvitamin D deficiency is associated with poor prognosis in patients with alcoholic liver disease. J Hepatol 2013;59:344-350
8. Malham M, Jørgensen SP, Ott P, Agnholt J, Vilstrup H, Borre M, Dahlerup JF. Vitamin D deficiency in cirrhosis relates to liver dysfunction rather than aetiology. World J Gastroenterol 2011;17: 922-925
9. Anty R, Tonohouan M, Ferrari-Panaia P, Piche T, Pariente A, Anstee QM, et al. Low Levels of 25-Hydroxy Vitamin D are Independently Associated with the Risk of Bacterial Infection in Cirrhotic

Patients. ClinTranslGastroenterol 2014;5:e56
10. Barchetta I, Carotti S, Labbadia G, Gentilucci UV, Muda AO, Angelico F, et al. Liver vitamin D receptor, CYP2R1, and CYP27A1 expression: relationship with liver histologyand vitamin D3 levels in patients with nonalcoholic steatohepatitis or hepatitis C virus. Hepatol 2012;56: 2180-2187
11. Skinner RK, Sherlock S, Long RG, Wilis MR. 25-Hydroxylation of vitamin D in primary biliary cirrhosis. Lancet 1977; 1: 720-721
12. Masuda S, Okano T, Osawa K, Shinjo M, Suematsu T, Kobayashi T. Concentrations of vitamin D-binding protein and vitamin D metabolites in plasma of patients with liver cirrhosis. J Nutr Sci Vitaminol (Tokyo) 1989;35:225-234
13. Stokes CS, Volmer DA, Grunhage F, Lammert F. Vitamin D in chronic liver disease. Liver Int 2013;33:338–352.
14. Anslo P, Brinton LA, Nyren O. Viral hepatitis and cirrhosis. N Engl J Med 1996;13:203-6.
15. Nadeem MA, Waseem T, Sheikh AM, Grumman N, Irfan K, Hasnain SS. Hepatitis C virus: An alarmingly increasing cause of liver cirrhosis in Pakistan. Pak J Gastroenterol 2002;16(1):3-8.
16. Arteh J, Narra S, Nair S. Prevalence of vitamin D deficiency in chronic liver disease. Dig Dis Sci 2010;55:2624-2628.
17. Rahimoon AG, Maheshwari SD, Memon N. Chronic liver disease; vitamin D deficiency in the patients. Profess Med J 2015;22(7):844-48.
18. Anty R, Tonohouan M, Ferrari-Panaia P, Piche T, Pariente A, Anstee QM, et al. Low Levels of 25-Hydroxy Vitamin D are Independently Associated with the Risk of Bacterial Infection in Cirrhotic Patients. ClinTransl Gastroenterol 2014; 5:56;1-10.
19. Falleti E, Bitetto D, Fabris C, Fattovich G, Cussigh A, Cmet S, et al. Vitamin D Binding Protein Gene Polymorphisms and Baseline Vitamin D Levels as Predictors of Antiviral Response in Chronic Hepatitis C. Hepatol 2012;56;5;1641-50.
20. Almani SA, Memon AS, Memon AI, Shah MI, Rahpoto MQ, Solangi R. Cirrhosis of liver: Etiological factors, complications and prognosis. JLUMHS 2008; 61-66
21. Shah HA, Jafri W, Malik I, Prescott L, Simmonds P. Hepatitis C virus (HCV) genotypes and chronic liver disease in Pakistan. J GastroenterolHepatol 1997; 12:758-61.
22. Bukhtiari N, Hussain T, Iqbal M, Malik AM, Quraishi AH, Hussain A. Hepatitis B and C single and co-infection in chronic liver disease and their effect on the disease pattern J Pak Med Assoc 2003; 53:136-40.
23. Farooqi JA, Khan PM. Viral aetiology of liver cirrhosis patients in Swat. Pak J Gastroenterol 2002;16(2):39-42.
24. Yan GZ, Duan YY, Ruan LT, Cao TS, Yuan LJ, Yang YL.Non-invasive quantitative testing of liver function using ultrasonography in patients with cirrhosis. Hepatogastroentrol 2006;53:15-20
25. Gerova DI[1], Galunska BT, Ivanova II, Kotzev IA, Tchervenkov TG, Balev SP, et al. Prevalence of vitamin D deficiency and insufficiency in Bulgari an patients with chronic HepatitisC viral infection.Sc and J Clin Lab Invest 2014;1-8.
26. Malham M, Jørgensen SP, Ott P, Agnholt J, Vilstrup H, Borre M, Dahlerup JF. Vitamin D deficiency in cirrhosis relates to liver dysfunction rather than aetiology. World J Gastroenterol 2011;17(7): 922-25
27. Farnik H, Bojunga J, Berger A, Allwinn R, Waidmann O, Kronenberger B, et al. Low vitamin D serum concentration is associated with high levels of hepatitis B virus replication in chronically infected patients. Hepatol 2013;58:1270-76.
28. Pappa HM, Bern E, Kamin D, Grand RJ. Vitamin D status in gastrointestinal and liver disease. Curr Opin Gastroenterol 2008;24: 176-83
29. Trepo E, Ouziel R, Pradat P, Momozawa Y, Quertinmont E, Gervy C, et al. Marked 25-hydroxyvitamin D deficiency is associated with poor prognosis inpatients with alcoholic liver disease. J Hepatol 2013;59:344–50.