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Original Research Article

Vitamin D Level in Non Alcoholic Fatty Liver Disease Patients: A Tertiary Care Hospital Experience

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Abstract:

Background: NAFLD is a spectrum of the disease characterized by hepatic steatosis when no other causes for secondary hepatic fat accumulation (e.g., excessive alcohol consumption) can be identified. Therefore our study was done to determine the etiology of non-alcoholic fatty liver patients and to estimate the Vitamin D level in non-alcoholic fatty liver patients.

Materials and Methods: Hospital based cross-sectional study was conducted in the Department of Biochemistry & General Medicine, S.P. Medical College and P.B.M Hospital, Bikaner. Sample size of 44 patients required at 80% study power and alpha error 100%. It is round of 50 patients for present study expecting approx. 5% not willing to study when 87.00% patients had insufficient Vitamin D level. Systemic random sampling method was done in this study.

Results: In present study, most patients 35 (70%) in NAFLD Group and 28 (56%) cases in control group were diabetic. In this study 50 patients are nonalcoholic in both groups. Out of 50 patients 33 (66.00 %) cases in NAFLD Group and 16(32.00%) subjects in control group were having vitamin D levels coming under deficient category.

Conclusion: Vitamin D deficiency is linked to an increased incidence of NAFLD as well as the severity of NAFLD grade. Estimating vitamin D levels can assist in minimizing the risk of NAFLD.

Keywords: NAFLD, Vitamin D, Meld Score.

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Introduction

The term non-alcoholic fatty liver disease (NAFLD) was first introduced by Schaffner in 1986. Non-alcoholic fatty liver disease (NAFLD) is a common cause of chronic liver disease worldwide [1]. NAFLD is a spectrum of the disease characterized by hepatic steatosis when no other causes for secondary hepatic fat accumulation can be identified [2]. Vitamin D deficiency (VDD) can result from problems relating to the absorption of vitamin D, hydroxylation due to liver failure, improper dietary intake, or inadequate exposure to sunlight [3-4]. The pathogenesis of the association between NAFLD and low vitamin D levels is still undetermined; however, protective anti-fibrotic and anti-inflammatory function of vitamin D on the hepatic stellate cells has been suggested. [5,6,7]

Materials and Methods

A cross-sectional study was conducted in the Department of Biochemistry & Gastroenterology Sardar Patel. Medical College and Associated Group of Hospital, Bikaner, Rajasthan. Sample size of 44 patients required at 80% study power and alpha error 100%. It is round of 50 patients for present study expecting approx. 5% not willing to study when 87.00% patients had insufficient Vitamin D level.

Sampling Method: Systemic random sampling

Inclusion Criteria:

Nafld

- Patients aged 18 to 60 years old, and had bright hepatic texture proven with abdominal ultrasound.
- Cases were willing to participate in study.

Control

- Matched normal control subjects with normal liver ultrasound /liver chemistry were included.

Exclusion Criteria

- Patients with chronic viral hepatitis, liver cirrhosis secondary to any cause, primary biliary cirrhosis, primary sclerosing cholangitis, and pregnant women, and patients on calcium or vitamin D supplementation and renal diseases.
- Patients that received vitamin D supply in the previous 2 months
- Cases were not willing to participate in study.

Observation & result:

Table 1: distribution of patients according to age

Age Group (In Years)	Control Group		NAFLD Group	
	n	%	n	%
18-35	10	20	8	16
36-55	37	74	37	74
>55	3	6	5	10
Total	50	100	50	100
p value	0.069			

In present study majority of cases of cases belonged to 36-55 years of age 37 (74%) and 37(74%) in control group followed by 20.00% cases & 16.00% control in 18.35 years' age group.

Table 2: distribution of cases according to diabetes mellitus

Diabetes Mellitus	Control Group		NAFLD Group	
	n	%	n	%
Yes (HbA1c > 6.5)	28	56	35	70
NO (HbA1c ≤ 6.5)	22	44	15	30
Total	50	100	50	100
p value	0.263			

In present study, most patients 35 (70%) in NAFLD Group and 28 (56%) cases in control group were diabetic

Table 3: distribution of cases according alcoholic

Alcoholic	Control Group		NAFLD Group	
	n	%	n	%
Yes	0	0	0	0
No	50	100	50	100
Total	50	100	50	100

In this study 50 patients are non alcoholic in both groups.

Table 4: distribution of cases according to vitamin d level

Vitamin D Category	Control Group		NAFLD Group	
	No.	%	No.	%
Deficient	16	32	33	66
Insufficient	28	56	12	24
Optimal	6	12	5	10
Total	50	100	50	100
p value	0.002			

Out of 50 patients 33 (66.00 %) cases in NAFLD Group and 16(32.00%) subjects in control group were having vitamin D levels coming under deficient category. Insufficient vitamin D Levels was observed in 12 (24%) in NAFLD Group and 28(56 %) cases in control group patients and only 5(10%) in NAFLD Group and 6(12%) in control group were having optimal vitamin D levels.

Table 5: meld score distribution

Meld Score	Control Group		NAFLD Group	
	No.	%	No.	%
<9	50	100	15	30
10 to 19	0	0	10	20
20 to 29	0	0	25	50
30 to 39	0	0	9	18
>39	0	0	1	2
Total	50	100	50	100
p value	0.0001			

In this study 30% patients belong to MELD score of less than 9 Whereas 20% patients belong to 10-20 MELD. 50% patients belong to 20-29 MELD scoring, 18 patients belong to 30-39 MELD scoring. Only 2% patients showed greater than 39

MELD scoring. Results were statistically significant as evident by p value.

Discussion

Vitamin D deficiency was linked to an increased risk of NAFLD in this cross-sectional research. Although the exact relationship between vitamin D and NAFLD is unknown. In present study majority of cases of cases belonged to 36-55 years of age 37 (74%) and 37(74%) in control group followed by 20.00% cases & 16.00% control in 18.35 years age group. The bulk of NAFLD cases were in their fourth and fifth decades, although there was no significant relationship, according to our data. Clinical characteristics were investigated by Basaranoglu and Neuschwander-Tetri. [8] and most occurrences were observed in people in their 40s or 50s.

We also observed that in NAFLD patients, vitamin D deficiency was significantly associated with insulin resistance. Multiple studies have demonstrated the association between obesity and vitamin D deficiency, with both working synergistically to influence the risk of insulin resistance [9] .Low levels of blood 25(OH)D are inversely linked with markers of obesity, including BMI (30 kg/m2), fat mass, and waist circumference [10]. In our investigation, vitamin D deficiency was also shown to be associated with elevated alanine transaminase and aspartate aminotransferase levels in NAFLD patients. The subsequent results may explain the potential processes underlying the link between vitamin D and NAFLD. Vitamin D influences extraskeletal metabolic organs, which can indirectly influence hepatic lipid metabolism and lower blood TC, TG, and LDL levels [11].

Conclusion

Vitamin D deficiency is linked to an increased incidence of NAFLD as well as the severity of NAFLD grade. Estimating vitamin D levels can assist in minimizing the risk of NAFLD. In NAFLD cases, vitamin D supplementation can help slow down the progression of the disease. In this study, vitamin D deficiency was also linked to deranged liver enzymes and dyslipidemia in NAFLD patients**.**

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