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Prevalence of low Vitamin D Levels in Patients with Irritable Bowel Syndrome at a Tertiary Care Hospital of Nepal

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ABSTRACT

Background

Vitamin D deficiency is a common disorder prevalent among both developed and developing countries. Irritable Bowel Syndrome has been linked to many diseases and conditions. Very few studies of vitamin D deficiency status have been done in Nepalese population. This study aims to find out the prevalence of low levels of Vitamin D in patients with Irritable Bowel Syndrome attending the outpatient department of a tertiary center.

Methods

This descriptive cross-sectional study was conducted in patients with Irritable Bowel Syndrome attending the outpatient department of Bharatpur Hospital, Chitwan, Nepal between 15, June 2024 to 20, august 2024. Ethical approval was taken from Bharatpur Hospital (Ref: 081/82-045). Sample size is 71. Data collection tools for self-administered questionnaire, the collected data was entered and analyzed in Microsoft Excel. Point estimate at 95% confidence interval was calculated along with frequency and proportion for binary data.

Results

Out of a total of 71 patients with Irritable Bowel Syndrome, the prevalence of low levels of vitamin D insufficiency was seen in 36 (50.7%) and deficiency was seen in 35 (49.3%). Clinical features were studied in the vitamin D deficient and vitamin D insufficient patients which included weakness, altered bowel habits, pain abdomen and lower back pain. Levels of vitamin D in IBS, the study of the stool frequencies showed most common to be once in more than 2 days numbered as 17 (24.0%).

Conclusions

Based on the findings of the study it concludes that low Vitamin D levels among patients with Irritable Bowel Syndrome. Vitamin D deficient and vitamin D insufficient patients which included weakness, altered bowel habits, pain abdomen and lower back pain.

Keywords: Irritable Bowel Syndrome; prevalence; Vitamin D deficiency.

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INTRODUCTION

Irritable bowel syndrome (IBS) is a common health problem with altered bowel function which affects the quality of human life characterized by abdominal pain or discomfort.¹ Studies have shown various comorbidities likely somatic pain syndromes, other gastrointestinal problems, and other psychiatric illnesses to be associated with IBS.²⁻⁵ Recent studies have proposed a relationship between low vitamin D and IBS which could be evident by its role as an immune modulator, anti-inflammatory, and anti-microbial agent.⁶⁻⁸ In addition, the vitamin D receptors (VDR) are expressed in the gut affecting its function, motility, and IBS symptoms.⁹ This study aims to find out the prevalence of low vitamin D levels in irritable bowel syndrome among the patients presenting to the Department of Internal Medicine of a tertiary center.

METHODS

A descriptive cross-sectional study was conducted among patients with Irritable bowel syndrome (IBS) patients presenting to the Department of Internal Medicine of Bharatpur Hospital, Chitwan, Nepal. Ethical approval was taken with from Institutional Review Committee of Bharatpur Hospital (Ref. No. 081/82-045). Patients who had given their consent, fulfilled the ROME IV criteria, and were of age above 15 years were included in the study and those with a history of recent use of antibiotics (in the last 4 weeks), gut surgery or radiation, coeliac disease, pregnancy or chronic illnesses were excluded.⁵ The sample size was calculated by using the prevalence of Vitamin D deficiency in patients with irritable bowel syndrome based on past study.¹⁰ The value of z was taken 1.96 at 95% confidence interval with 9% margin of error. Using the formula, $n = Z^2 \times p \times q / e^2 = (1.96)^2 \times 0.82 \times (1-0.82) / (0.09)^2 =$ sample size is 71. Where, n = Sample size, Z = 1.96 at 95% Confidence Interval, $P = q = 1-P$, e = margin of error=9%. Convenient sampling technique was used for the data collection. Study Period was conducted for 15 June 2024 to 20 august 2024. History was taken in detail and clinical examinations were done. Patients were diagnosed with Irritable Bowel Syndrome (IBS) by using ROME IV criteria.¹⁰

Who had recurrent abdominal pain on average at least 1 day/ week in the last 3 months and fulfilling two or more of the following criteria:(1) Relation with defecation, (2) Associated with an alteration in the frequency of stool, (3) Associated with an alteration in the form (appearance) of stool. Informed consent from these patients was taken and serum Vitamin D levels were measured. Around 5ml of whole blood, which was free from hemolysis, was initially centrifuged at 3000 rates per minute at 10 minutes. The separated serum was analyzed for vitamin D levels using an automated analyzer. Low levels of Vitamin D were defined by using the following criteria as per the 25 (OH) D concentrations:⁷

Vitamin D sufficiency: If vitamin D level is greater than 20 ng/mL (50 nmol/L)

Vitamin D insufficiency: Vit D insufficiency is labelled if 12 to 20 ng/mL (30 to 50 nmol/L)

Vitamin D deficiency: If Vitamin D level is less than 12 ng/mL (30 nmol/L)

The data were entered into Microsoft Excel and descriptive statistics were calculated.

RESULTS

Among 71 patients, majority (66.2%) of them were 40-59 year of age and 9.9% were ≥ 60 year of age. The Mean \pm SD of age was 45.72 ± 9.866 years. The minimum age was 26 years while maximum was 69 years. Regarding the sex of the patients, majority (87.3%) were male and 12.7% were female. Regarding address of the respondents, majority (80.3%) of the

Table 1. Socio-demographic characteristics of the patients. (n=71)

Variables	Frequency (%)
Age (years)	
<39	17(23.9)
40-59	47(66.2)
>60	7(9.9)
Mean \pm SD= 45.72 \pm 9.866, Min(Max)=26(69) years	
Sex	
Male	62(87.3)
Female	9(12.7)
Address	
Chitwan	57(80.3)
Gaindakot	12(16.9)
Kawasoti	2(2.8)

respondents were from Chitwan district and only (2.2%) of the respondents were Kawasoti District (Table 1).

Out of the total patients with low vitamin levels, insufficiency was seen in 36 (50.7%) and deficiency was seen in 35 (49.3%). Out of the patients with low vitamin levels, insufficiency was seen in 36 (50.7%) and deficiency was seen in 35 (49.3%) (Table 2).

These 71 (100%) patients who had low vitamin D

Table 2. Distribution of patients according to age and gender. (n=71)

Variables	Vitamin D Deficiency	Vitamin D Insufficiency
Age		
≤39 years	5(7.0%)	12(16.9%)
40-59 years	24(33.8%)	23(32.4%)
>60 years	6(8.5%)	1(1.4%)
Gender		
Male	26(36.6%)	36(50.7%)
Female	9(12.7%)	-

levels were sub-classified based on their predominant stool pattern as IBS with constipation (IBS-C), IBS with diarrhea (IBS-D) and others (includes Mixed IBS and Un subtyped IBS)¹¹ as shown in the table below (Table 3).

Table 3. Subtypes of IBS. (n=71)

Variables	IBS-D	IBS-C
Vitamin D deficiency	20(28.2%)	12(16.9%)
Vitamin D insufficiency	21(29.6%)	11(15.5%)

Out of these patients, the common clinical features were studied in the vitamin D deficient and vitamin D insufficient patients which included weakness, altered bowel habits, pain abdomen and lower back pain (Table 4).

Table 4. Clinical features among patients of IBS with low Vitamin D levels. (n=71)

Variables	Weakness	Altered bowel Habits	Pain Abdomen	LBP
Vitamin D deficiency	35(49.3%)	35(49.3%)	34(47.9%)	35(49.3%)
Vitamin D insufficiency	25(35.2%)	33(46.5%)	36(50.7%)	32(45.1%)

Among the 71 patients with low levels of vitamin D in IBS, the study of the stool frequencies showed most common to be once in more than 2 days numbered as 17 (24.0%) (Table 5).

DISCUSSION

Although the association of vitamin D with various

Table 5. Stool frequencies among patients of IBS with low Vitamin D levels. (n=71)

Variables	0-2 times a day	3-4times a day	>4times a day	Once in more 2 days
Vitamin D deficiency	2(5.7%)	9(25.7%)	14(40.0%)	10(28.6%)
Vitamin D insufficiency	10(27.8%)	15(41.7%)	4(11.1%)	7(19.4%)

other systemic illnesses has been established, vitamin D has been the focus of discussion in the medical field. Even though the role of vitamin D deficiency in IBS has not yet been clearly evident, multiple studies are underway to clearly establish its role. A recent report has been remarkably successful in sparking a gush of interest from the scientific community and attention of the medical blogs as it showed a success in the treatment of IBS with large doses of oral vitamin D supplementation, further showing resolution of the associated anxiety and depression as well.¹² The present study found the prevalence of low Vitamin D levels among patients with Irritable Bowel Syndrome to be lower when compared to another study by Khayyat Y, et al.,⁷ which detected vitamin D deficiency (here defined as <50 nmol/L) among 82% of the patients with IBS. The mean serum level of 25(OH) D₃ in IBS patients was 21±12 nmol/L which was higher than our study's findings. In another study, majority of participants had baseline 25(OH)D₃ levels that are considered insufficient/severely deficient with an overall sample mean 25(OH)D₃ of 15.3±7.9 ng/mL and 81.8% of IBS-C (n = 7), 70% of IBS-D (n = 9) and 81.6% of IBS-M (n = 24) with <20ng/mL circulating 25(OH)D₃ levels. This prevalence was higher when compared to our study.¹⁴

Limitations

The main limitation of this study was the small sample size which shows the need of larger studies. This study is conducted in a single center so it cannot be generalized and the finding of this study is limited to our population only. Also, being a descriptive Cross-sectional study, causality cannot be established and there is a need of further studies for the same. Some of the cases of IBS may have been missed which would affect the overall validity of the study.

CONCLUSIONS

Based on the findings of the study it concludes that low Vitamin D levels among patients with Irritable Bowel Syndrome. Vitamin D deficient and vitamin D insufficient patients which included weakness, altered bowel habits, pain abdomen and lower back pain. Patients who had Low vitamin D levels were sub-classified based on their predominant stool

pattern as IBS with constipation (IBS-C), IBS with diarrhea (IBS-D) and others (includes Mixed IBS and Un subtyped IBS).

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REFERENCES

1. Chey, W. D., Kurlander, J., & Eswaran, S. (2015). Irritable bowel syndrome: A clinical review. *JAMA*, 313(9), 949–958. [DOI]
2. Riedl A, Schmidtman M, Stengel A, et al. Somatic comorbidities of irritable bowel syndrome: a systematic analysis. *J Psychosom Res*. 2008;64 (6):573-82. [DOI]
3. Lovell RM, Ford AC. Prevalence of gastro-esophageal reflux-type symptoms in individuals with irritable bowel syndrome in the community: a meta-analysis. *Am J Gastroenterol*. 2012 Dec;107(12):1793-801; quiz 1802. [DOI]
4. Ford AC, Marwaha A, Lim A, Moayyedi P. Systemic review and meta-analysis of the prevalence of irritable bowel syndrome in individuals with dyspepsia. *Clin Gastroenterol Hepatol*. 2010 May;8(5):401-9. [DOI]
5. Fond G, Loundou A, Hamdani N, Boukouaci W, Dargel A, Oliveira J, Roger M, Tamouza R, Leboyer M, Boyer L. Anxiety and depression comorbidities in irritable bowel syndrome (IBS): a systematic review and meta-analysis. *Eur Arch Psychiatry Clin Neurosci*. 2014 Dec;264(8):651-60. [DOI]
6. Armstrong DJ, Meenagh GK, Bickle I, Lee AS, Curran ES, Finch MB. Vitamin D deficiency is associated with anxiety and depression in fibromyalgia. *Clin Rheumatol*. 2007 Apr;26(4):551-4. [DOI]
7. Khayyat Y, Attar S. Vitamin D Deficiency in Patients with Irritable Bowel Syndrome: Does it Exist? *Oman Med J*. 2015 Mar;30(2):115-8. [DOI]
8. Nwosu BU, Maranda L, Candela N. Vitamin D status in pediatric irritable bowel syndrome. *PLoS One*. 2017 Feb 13;12(2):e0172183. [DOI]
9. Kong J, Zhang Z, Musch MW, Ning G, Sun J, Hart J, Bissonnette M, Li YC. Novel role of the vitamin D receptor in maintaining the integrity of the intestinal mucosal barrier. *Am J Physiol Gastrointest Liver Physiol*. 2008 Jan;294(1):G208-16. [DOI]
10. Lacy BE, Patel NK. Rome Criteria and a Diagnostic Approach to Irritable Bowel Syndrome. *J Clin Med*. 2017 Oct 26;6(11):99. [DOI]
11. Longstreth GF, Thompson WG, Chey WD, Houghton LA, Mearin F, Spiller RC. Functional bowel disorders. *Gastroenterology*. 2006 Apr;130(5):1480-91. [DOI]
12. Sprake EF, Grant VA, Corfe BM. Vitamin D3 as a novel treatment for irritable bowel syndrome: single case leads to critical analysis of patient-centered data. *BMJ Case Rep*. 2012 Dec 13;2012: bcr-2012-007223. [DOI]
13. Yarandi, S., & Christie, J. (2013). The prevalence of vitamin D deficiency in patients with irritable bowel syndrome [Abstract]. *The American Journal of Gastroenterology*, 108 (Supplement), S565. [DOI]
14. Bhandari, A, & Chaudhary, A. (2021). Low Vitamin D Levels in Patients with Irritable Bowel Syndrome of a Tertiary Care Hospital: A Descriptive Cross-sectional Study. *Journal of Nepal Medical Association*, 59(242), 1030–1034. [DOI]

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