

To Study the Prevalence of Vitamin B₁₂ Deficiency among Patients with Hypothyroidism

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ABSTRACT

Background and aim: The most prevalent endocrine disorder in developing countries is related to thyroid imbalance. Hypothyroidism is a common endocrine disorder with reduced production of thyroid hormones. Primary hypothyroidism is defined by TSH concentrations above the reference range and free thyroxine concentration below the reference range. We tried to ascertain the prevalence of vitamin B₁₂ deficiency (<200 pg/mL) among patients with hypothyroidism.

Materials and methods: A hospital-based study was done on patients of hypothyroidism fitting in inclusion and exclusion criteria attending the OPD/IPD of Mahatma Gandhi Hospital, Jaipur.

Results: Most of the hypothyroid patients are <50 years of age; out of these, 24.5% of patients had vitamin B₁₂ deficiency. While in the age-group >50 years, 27.3% of patients had vitamin B₁₂ deficiency.

Conclusion: Vitamin B₁₂ deficiency is common in hypothyroid patients. Screening for vitamin B₁₂ deficiency should be undertaken routinely in the diagnosis of hypothyroidism and regularly thereafter.

Keywords: Anemia, Hypothyroidism, Macrocytosis, Vitamin B₁₂ deficiency.

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INTRODUCTION

The most prevalent endocrine disorder in developing countries is related to thyroid imbalance. Hypothyroidism is a common endocrine disorder with reduced production of thyroid hormones. It occurs in 10% of women and 6% of men with age >65 years.^{1,2} However, the common occurrence of hypothyroidism was three times more in women than in men (12.4 vs 3.7%) in developing countries like Spain.³ Sex, geographical factors, age, ethnicity, and iodine consumption are the determining factors for the occurrence of thyroid problems.^{1,2}

Vitamin B₁₂ deficiency is associated with a wide range of hematological and neurological, as well as psychiatric and cardiovascular symptoms.⁴ The classic manifestations of deficiency include glossitis, megaloblastic anemia, and myelin deterioration.⁵ Neurological and psychiatric manifestations, which may include myelopathy, neuropathy, impaired memory, depression, and dementia, are particularly serious, as they can occur even with subclinical deficiency and may become irreversible if left untreated.

MATERIALS AND METHODS

This study is conducted on patients with hypothyroidism who attend OPD/IPD of the Department of General Medicine, Mahatma Gandhi Medical College and Hospital, Jaipur.

Inclusion Criteria

All male and female patients in the age-group >18 years who had hypothyroidism and had given consent were included in the study.

Exclusion Criteria

Patients who fail to give consent, gastric or ileal resection, gastric bypass or bariatric surgery, pernicious anemia, Zollinger–Ellison syndrome, Crohn's disease, tropical sprue, pancreatic insufficiency,

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alcoholics, patients on drugs known to interfere with vitamin B₁₂ metabolism (metformin, long-term PPI use, anticonvulsant drugs, colchicines, neomycin, anti-metabolite para aminosalicylate/PAS, etc.), and pregnant females.

RESULTS (TABLES 1 TO 4)

Table 1: Distribution of patients based on gender

Gender	No. of cases (n)	Percentage
Male	64	42.7
Female	86	57.3

Table 2: Distribution of patients based on age

Age	No. of cases (n)	Percentage
<50 years	106	70.7
>50 years	44	29.3

Table 3: Comparison of gender with vitamin B₁₂ deficiency in hypothyroid patients

Gender	Vitamin B ₁₂ > 200	Vitamin B ₁₂ < 200	Chi-square	p value
Female	59 (68.6)	27 (31.4)	4.633	0.031
Male	53 (82.8)	11 (17.2)		

Table 4: Comparison of clinical symptoms with vitamin B₁₂ deficiency in hypothyroid patients

Symptoms	Total	Vitamin B ₁₂ < 200 (%)	Vitamin B ₁₂ > 200 (%)
Weakness	73	31 (42.5)	42 (57.5)
Numbness	26	14 (53.8)	12 (46.2)
Diarrhea	26	03 (37.5)	05 (62.5)
Abdominal pain	23	10 (43.5)	13 (56.5)
Impaired memory	11	04 (30.8)	09 (69.2)
Fever	10	03 (30.0)	07 (70.0)
Paresthesia	19	11 (57.9)	08 (42.1)
Dysphagia	18	10 (55.6)	08 (44.4)
Dizziness	30	10 (33.3)	20 (66.7)
Depression	25	11 (44.0)	14 (56.0)

DISCUSSION

In this study, a total of 150 patients were included; out of these 150 patients, 64 (42.7%) patients were males, and 86 (57.3%) patients were females. Male:female ratio of this study was 1:1.34. It shows hypothyroidism is more common in females.

In this study, we categorized patients according to age in two groups <50 and >50 years of age and compared both groups according to vitamin B₁₂ levels. One hundred and six patients were <50 years of age while the remaining 44 patients were >50 years of age. It shows most of the hypothyroid patients are <50 years of age. Patients who had age <50 years included 106 patients. Out of these, 24.5% of patients had vitamin B₁₂ deficiency. While in the age-group >50 years, 27.3% of patients had vitamin B₁₂ deficiency. It shows in the higher age-group vitamin B₁₂ deficiency is more prevalent but this difference was statistically non-significant ($p > 0.05$).

When we compared males and females and estimate their vitamin B₁₂ levels, we found that 31.4% of females and 17.2% of males had vitamin B₁₂ <200 pg/mL. 68.6% females had vitamin B₁₂ > 200 pg/mL and 82.8% of males had vitamin B₁₂ > 200 pg/mL. It

shows females had more prevalence of vitamin B₁₂ deficiency in comparison to males and this difference was statistically significant ($p < 0.05$).

In this study, hypothyroid and vitamin B₁₂ deficient patients often have symptoms of weakness (42.5%), numbness (53.8%), diarrhea (37.5%), abdominal pain (43.5%), impaired memory (30.8%), fever (30.0%), paresthesia (57.9%), dysphagia (55.6%), dizziness (33.3%), and depression (44.0%). In this study, we noted that the complaint of weakness was common in both patients with normal and low vitamin B₁₂ levels. Complaints of memory impairment and frequency of depression also did not differ. Differences in frequencies of numbness and paresthesia did not reach statistical significance between vitamin B₁₂ sufficient and deficient groups. Fever and dizziness are two symptoms that differ in both groups significantly.

CONCLUSION

Our study showed vitamin B₁₂ deficiency is common in hypothyroid patients. Screening for vitamin B₁₂ deficiency should be undertaken routinely in the diagnosis of hypothyroidism and regularly thereafter. Patients should be followed and evaluated for indicative symptoms. Surrogate markers including anemia and macrocytosis cannot be relied upon to select out likely B₁₂ deficient individuals. Larger studies need to be undertaken to evaluate this further. Initiation of early therapy will prevent the long-term sequelae of vitamin B₁₂ deficiency.

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