

FREQUENCY OF VITAMIN B₁₂ DEFICIENCY IN PATIENTS WITH HELICOBACTER PYLORI GASTRITIS

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ABSTRACT

Objective: To determine the frequency of vitamin B₁₂ deficiency in patients with *Helicobacter pylori* gastritis.

Study Design: Descriptive study

Setting: Department of Medicine, Military Hospital, Rawalpindi.

Duration: From October 2007 to March 2008.

Subjects and Methods: One hundred *Helicobacter pylori* (*H pylori*) positive patients with endoscopic evidence of gastritis were included. Demographics (age and gender) and levels of vitamin B₁₂ (using Vitros Immunodiagnostic system) were collected in all cases.

Results: Nearly two third (64%) patients were males with mean age of 50.8±13.59 years. Thirteen percent patients had deficiency of vitamin B₁₂, 5% were border line deficient, and 82% had normal levels of vitamin B₁₂.

Conclusion: In *H pylori* gastritis patients frequency of vitamin B₁₂ deficiency is 13% i.e. about one fifth of patients in present study.

Keywords: Gastritis, *Helicobacter pylori*, Vitamin B₁₂.

INTRODUCTION

Helicobacter pylori (*H Pylori*) has been recognized as the major etiologic factor of gastritis and peptic ulcer disease in adults and children¹. In Pakistan, infection rate with this organism is about 83% in adult patients undergoing upper GI endoscopy for various reasons². *H pylori* impairs the normal secretion of hydrochloric acid, provoking achlorhydria in infected patients³. As a result of its interference, *H pylori* may modify the absorption of many nutrients and then compromise the nutritional status of infected patients, resulting in diverse clinical manifestations⁴.

Vitamin B₁₂ (Cobalamin) deficiency is a common but under-recognized disorder with a reported prevalence ranging from 3-40% in the adult population⁵. Growing evidence of the relationship between *H pylori* infection and food-cobalamin malabsorption⁶ has led to the suggestion that chronic *H pylori* gastritis may be the most frequent cause of cobalamin deficiency, especially in developing countries. Study by Hershko et al suggests that pernicious

anemia possibly starts many years before the establishment of clinical cobalamin deficiency, by an autoimmune process likely triggered by *H pylori*⁷. If the microorganism could be eradicated, patient does not need lifelong cyanocobalamin replacement therapy and it may be possible to impede development of pernicious anemia⁷. This suggestion is supported by two different studies evaluating the effect of eradication treatment on the improvement of vitamin B₁₂ deficiency in patient groups either with atrophic or non-atrophic gastric mucosa^{8,9}.

The above-mentioned probable link between cobalamin deficiency and *H pylori* infection has led to the idea of this study in our setup. The results will help in making recommendations in the treatment of vitamin B₁₂ deficiency, empirically, without resorting to expensive B₁₂ assays.

SUBJECTS AND METHODS

This observational study was carried out on outdoor cases reporting in Gastroenterology Department of Military Hospital (MH) Rawalpindi, from October 2007 to March 2008. One hundred patients were selected from those who underwent upper gastrointestinal

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endoscopy for dyspepsia and later reported for follow-up with biopsy report of histopathology. All patients were histologically positive for *H. pylori* and had chronic inflammatory changes in gastric mucosa. The study was performed after approval from the ethics committee, and all patients consented for the participation.

Before selection a careful history was taken and detailed clinical examination carried out. Patients with a history of recent gastrointestinal surgery; pregnancy; on strict vegetarian diet; using drugs like antibiotics, proton pump inhibitors, H₂ receptor blockers, non steroidal anti inflammatory drugs in preceding four weeks; history of autoimmune disorders; history of organic and metabolic disease (diabetes mellitus, chronic liver diseases, renal failure) requiring continuous medications; blood transfusion in the previous six months were not included in the study because all these conditions could lead to deficiency of vitamin B₁₂ and could act as confounders.

Vitamin B₁₂ Levels: Analysis of serum samples was carried out at the Armed Forces Institute of Pathology (AFIP), Rawalpindi, by the Vitros Immunodiagnostic system, used according to manufacturer's instructions. The results were interpreted as follows: Deficient: < 200; Borderline: 200-299; Normal: > 300 pg/ml.

Data Analysis

The data was entered in SPSS (version 11). Descriptive statistics were used to calculate mean and standard deviation (SD) for quantitative variable i.e. age. Percentages were calculated for qualitative variables i.e. gender and deficiency of vitamin B₁₂.

RESULTS

Gender distribution was 64% males and 36% females. Mean age was 50.8±13.59 years (Figure). Thirteen percent patients had deficiency of vitamin B₁₂, 5% were border line deficient, and 82% had normal levels of vitamin B₁₂. As shown in Table vitamin B₁₂ deficiency was more common in middle age group i.e. 41-60 years.

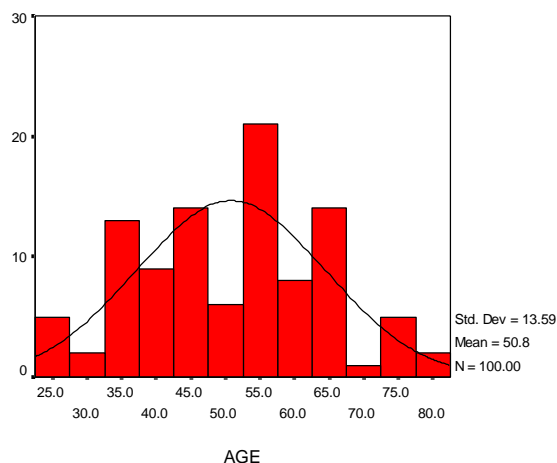


Figure: Description of age in all patients (n=100).

Table: Vitamin b₁₂ deficiency in different age groups

Age Groups	Normal	Borderline	Deficient	Total
20-40	20	2	2	24
41-60	39	1	7	47
>60	23	2	4	29
Total	82	5	13	100

DISCUSSION

The discovery that *H pylori* is a gastro-duodenal pathogen has affected the management of many gastroenterological diseases. *H pylori* is being increasingly identified as an independent risk factor for vitamin B₁₂ deficiency.^{6,9} Moreover, *H pylori* is also being investigated for its possible role in extra-gastrointestinal disorders, such as impaired growth, coronary artery disease, diabetes mellitus and gallstone disease.¹⁰

In the present study, the most probable reason of male preponderance (male to female ratio 1.77) as compared to a contemporary study¹¹ is that in MH, where the study was carried out, the main patient input is of soldiers and they are given medical treatment on first priority and moreover cases are referred from all over the country from the smaller military hospitals to MH for proper investigative work up and disposal. Reason for the higher mean age of males is the same as explained above; moreover the males remain entitled for free medical treatment even after retirement from military service whereas the families are not.

The results of our study are comparable to a recent study performed at Karachi by Zuberi et al which has demonstrated that vitamin B₁₂ deficiency was found in 18% patients¹¹. Gumurdulu et al have also shown vitamin B₁₂ deficiency in 18% patients¹². In another Turkish study, Kaptan et al demonstrated that *H pylori* was positive in 77 (56%) out of 137 adult patients with vitamin B₁₂ deficiency and eradication of this bacteria improved vitamin B₁₂ in 31 (40%) out of 77 infected patients¹³

In our study, no data concerning pernicious anemia could be provided due to non-availability of appropriate laboratory tests like Schilling test, anti-intrinsic factor antibody and others for exclusion of pernicious anemia¹⁴. However, it has been reported that prevalence of *H pylori* in patients with pernicious anemia was 0-21%¹⁵⁻¹⁷. These studies demonstrate that *H pylori* infection is an infrequent finding in patients with pernicious anemia supporting the observation that gastric tissue with pernicious anemia is refractory to colonization with *H pylori*. These findings combined with the inclusion criteria of our study that is presence of *H pylori*, may help exclude the existence of pernicious anemia in *H pylori* infected subjects.

There was no control group of *H pylori* negative persons in our study. In Pakistan, no substantial data regarding deficiency of vitamin B₁₂ in general population as well as in *H pylori* negative patients is available. Zuberi et al¹¹ found that 4% of *H pylori* negative patients had deficiency of vitamin B₁₂. In the general population, Vitamin B₁₂ deficiency is reported to be 3-4%^{18,19}. The prevalence is reported to be higher (15-25%) among elderly specifically nursing home residents.^{20, 21} In our study the maximum number of deficiency is in the age group of 41-60 years and no patient was a nursing home resident.

Further studies involving the larger cohorts of patients and controls and examining the effect of eradication therapy on B₁₂ levels are required to further clarify the association between *H pylori* gastritis and deficiency of B₁₂.

CONCLUSION

Frequency of vitamin B₁₂ deficiency in patients with *H pylori* gastritis was found to be 13%. High index of suspicion for vitamin B₁₂ deficiency should be exercised in these patients to avoid the hematological and neurological complications.

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