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Original Article

Internal Medicine Section

Opportunistic Screening of Vitamin B12 Deficiency in IT Professionals Presenting for Routine Health Check-up

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ABSTRACT

Introduction: Vitamin B12 deficiency is mainly diagnosed in symptomatic patients. However, the deficiency may also be prevalent in asymptomatic patients. Our aim was to study the prevalence of Vit B12 deficiency in IT professionals (Information Technology Professionals from Software industry) who presented for routine health screening and to correlate the deficiency to various parameters.

Materials and Methods: This was single centre, observational study comprising of 84 IT professionals. The data was collected in structured format. The study was designed to identify prevalence of Vit B12 deficiency and correlate to other factors such as type of diet, income level & regular use of medication (such as Antacid & Metformin).

Results: Total 28 individuals were found to be deficient (33.34%). Prevalence of Vit B12 deficiency amongst Vegetarian and non vegetarian diet adhering subjects was 47.5% and 20.45% respectively. B12 deficiency was also prevalent in high income age group. Further chronic intake of PPI (Proton pump inhibitor) and Metformin was associated with prevalence of 37.5% and 33.34% in the present study.

Conclusion: During health screening of IT Professionals, significant prevalence of Vit B12 deficiency was noted across all income groups & non vegetarian diet consuming subjects also. There is significant correlation between Vit B12 deficiency with chronic use of PPI and Metformin.

Keywords: Asymptomatic patients, Proton pump inhibitor, Serum Vitamin

INTRODUCTION

Vitamin B12 is predominantly available from animal sources or from supplements [1]. Lack of adequate amount of vitB12, can cause varied systemic manifestations [2]. Vitamin B12 deficiency is increasingly given more attention in symptomatic patients. However, it is postulated that this entity is also prevalent in asymptomatic and affluent population, who can otherwise have access to good quality diet. The disorder needs to be recognised at early stage as the complications are entirely preventable by supplementation of the vitamin.

Vitamin B12 is difficult to available only from Vegetarian sources in recommended daily intake. Further, those who do take non vegetarian food, may also be deficient in B12 due to variety of factors such as inadequate intake or iatrogenic factors such as medicines causing B12 depletion. To determine the same, we conducted the study on IT professionals from Pune, presenting for routine health checkup.

OBJECTIVE

To identify prevalence of Vitamin B12 deficiency in IT professionals presenting for routine health checkup.

MATERIALS AND METHODS

This observational, single center study was carried out in Pune from April 2013 till July 2013. The subjects comprised of IT professionals coming for routine health check up / screening. Those who were already diagnosed with B12 deficiency, were excluded from the study. Informed consent was obtained from all the subjects enrolled in the study. Data regarding their age, dietary habits, any concurrent medication(s) (Such as Metformin, Proton Pump inhibitors), Income level (classified as Grp A. Upto 3 Lac; Grp B. 3-6 Lac & Grp.C. >6 Lac) was obtained. The individuals eating Non vegetarian diet, were divided into groups based on their frequency of Non-Veg food intake per week, as under: (A) Approx once per week; (B) Approx 2 or more than 2 times per week; (C) Daily; (D) Occassionally- Once in 2 or more than 2 weeks).

From the laboratory investigations, Haemoglobin and Serum Vitamin B12 values were noted. The information was entered in MS Excel sheet and descriptive statistics like mean, percentages and chi square test were used as test of significance.

RESULTS

Total 84 individuals (55 Male and 29 Females) were enrolled in the study. The higher Male: Female ratio may be due to selected profession (IT sector) chosen for the study. Mean age of participants was 32.3 Years. Total 28 individuals were found to be deficient (value less than 187pg/mL) according to reference range of the Lab (187-883 pg/ml) [Table/Fig-1].

Total Study Subjects (n=84); Male 55; Female 29			
	Vitamin B12 deficient		Non Deficient
	n=28 (Male – 17; Females – 11)		*n*=56 (Male – 38; Female – 18)
Vegetarian (n=40)	19		21
Non Vegetarian (n=44)	Group Description	B12 deficient subjects (n=9)	35
	Group A (n=4): Non veg diet Approx once per week	4	
	Group B (n=5): Non veg diet: Approx 2 or more than 2 times per week	1	
	Group C (n=2): Non veg diet: Daily	0	
	Group D (n=33): Non veg diet: Occasionally	4	
Long term use of PPI (n=8)	3		5
On Metformin Therapy (n=9)	3		6

[Table/Fig-1]: Showing distribution of prevalence of vit b12 deficient subjects

Out of 44 subjects consuming Non vegetarian diet, 9 were also having Vitamin B12 deficiency (20.4%). Across different income groups—Group A: n=5 (71.4%), Group B: n= 8 (27%) and Group C: n=15 (31.2%), subjects were affected with the disorder [Table/Fig-2].

Income groups (Income in INR per year)	Total subjects	B12 deficient
Group A : Upto 3 Lac	7	5 (71.4%)
Group B : Between 3-6 Lac	29	8 (27%)
Group C : >6 Lac	48	15 (31.2%)
Total	84	28

[Table/Fig-2]: Showing distribution of Study subjects according to Income range

Further, the study subjects who were taking Metformin (n=9) for treatment of Type 2 Diabetes mellitus, 3 were also affected (33.34%). Similarly, of the persons (n=8) taking PPI on regular basis, 3 (37.5%) were affected.

In our study, B12 deficiency prevalence was 47.5% (19/40) (p-value <0.05) amongst vegetarian subjects. Amongst the persons consuming non vegetarian foods, the disorder was also present 20.4% (9/44) (p-value <0.05).

DISCUSSION

Vitamins are defined as a group of organic compounds which are essential for growth & are required in small quantities in diet as they cannot be synthesized by the body [3]. Vit B12 which has important functions across varied bodily systems [4], also needs to be obtained from food or supplements. It is well known fact that amount of Vit B12 in vegetarian food [5] or food products is low & may not always be sufficient enough to meet the bodily requirements. As the age advances, absorption of B12 reduces due to higher incidence of atrophic gastritis & reduced active intestinal transport [6]. Mean age of the subjects in our study was 32.3 years. Significant prevalence in such young age group, needs to screen for nutritional or iatrogenic factors causing the deficiency.

Access to good quality food is one of the prime requirements to prevent the deficiency. However, having adequate amount of income does not translate into prevention of deficiency as found in the present study. The prevalence of B12 deficiency in high income Group C, was 31.2%. Potential reasons may be lack of awareness about the entity, unwillingness or impracticality or religious beliefs of eating non vegetarian food items.

As many studies [7,8] have already highlighted, the disorder is known to be significantly prevalent amongst vegetarian population. In our study, B12 deficiency prevalence was 47.5% (19/40) (p-value <0.05) amongst vegetarian subjects. Amongst the persons consuming non vegetarian foods, the disorder was also present 20.4%. (9/44) (p-value <0.05). The possible common reason may be due to low frequency of consumption of non vegetarian food. As many as 33 subjects amongst non vegetarian group, were eating such non-veg diet only on occasional basis. Further, some traditional ways of cooking, may be responsible for partial degradation of vitamin B12 [9].

PPI (Proton Pump inhibitor) are used for treatment of Gastritis, Gastroesophageal reflux disease. However many a times, it is purchased over the counter and self medicated for weeks or even months together. Long term use of PPI is associated with impaired Magnesium absorption, iron and Vit B12 deficiency [10,11]. We found 8 subjects who were regularly taking PPI on daily basis, of whom 3 (37.5%) were suffering from B12 deficiency.

Due to sedentary life style, lack of exercise, diet consisting of high amount of refined carbohydrates [12] & growing urbanisation have lead to increasing incidence of Diabetes mellitus across the world [13]. Metformin still remains a drug of choice for treatment of Type 2 Diabetes mellitus. Its association with B12 deficiency has been well documented by various studies [14,15]. The present study showed significant prevalence (3/9 :33.34%) of Vitamin B12 amongst the subjects receiving Metformin (n=9).

LIMITATIONS

The following were the limitations of this study. It was conducted in selected population from a specific profession (IT Industry) & was limited to single center. This may not be representative of entire community.

CONCLUSION

Vitamin B12 deficiency is prevalent amongst IT professionals, despite the high income & varying dietary habits. Iatrogenic factors causing B12 deficiency were long term use of PPI and Metformin. Clinicians should have high index of suspicion for identifying & treating of Vit B12 deficiency in such population.

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