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Original Research Article

Prevalence of B12 in the Northern Indian Vegetarian Population- A Clinical Study

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Abstract

Background: Background: Vitamin B12 (B12) deficiency leads to a wide spectrum of disorders affecting all age groups. However, reports on B12 status in vegetarian adults in India are limited. Hence, we determined the prevalence of B12 in the northern Indian vegetarian population. ***Methods:*** A cross sectional study was conducted in an urban north Indian population amongst 200 apparently adults distributed into 3 age groups: <20, 21-40 and >40 years. Plasma concentrations of B12 were analyzed. ***Results:*** The overall prevalence of B12 deficiency was 45%. B12 deficiency was higher in vegetarians (35.5%) compared to those consuming non vegetarian diet (9.5%). ***Conclusions:*** These results indicate a higher prevalence of B12 deficiency in apparently healthy vegetarian adults in a north Indian population.
Keywords: Vitamin b12 deficiency, metabolism, vegetarians.

INTRODUCTION

Vitamin B12 (B12) play a vital role in various biological functions and regulates various metabolic processes in the body [1, 2]. It was observed that vegetarians have consistently lower vitamin B-12 concentrations than do nonvegetarians and that vegetarians are at greater risk of vitamin B-12 deficiency than are nonvegetarians. Because vitamin B-12 is produced in nature only by vitamin B-12-producing microorganisms, humans must receive vitamin B-12 solely from the diet [3, 4]. Prevalence in the general population varies from 3% to 5%, and from 5% to 20% among people older than 65 [5-8].

Vitamin B12 plays vital role in the healthy maintenance of skin, mucous membrane, hematological and central nervous system. Although deficiency of this vitamin can occur primarily as a result of insufficient dietary intake or poor absorption, various other factors such as sociocultural, gender, age, genetic and ethnic backgrounds are likely to influence their status [9-11]. Deficiency of B12, as assessed by the blood status, has been reported across population groups and in different stages of development in both developed and developing countries. We conducted a study to show the prevalence of vit b12 deficiency in vegetarians in northern population of india.

METHODS

This cross sectional study was conducted in the Department of medicine,Government Medical College Amritsar, Punjab, India from June 2018 to December 2018.During this period, Out of total 200 admission, 90 patients had moderate (Hb 7-9gm/dl) to severe (Hb < 7.0gm/dl) anaemia. The subjects were enrolled on predesigned Performa including detailed clinical, dietary, drug, immunological and personal history. All these patients were subjected to hematological, biochemical and other relevant investigations. Only those who consumed meat or fish were considered as nonvegetarians. Lacto vegetarians as well as lactoovovegetarians were grouped under vegetarians.

Exclusion Criteria

Those taking multivitamin supplements for the last 6 months or having a history of surgical operation of the gastrointestinal tract or suffering from acute illness at the time of enrollment of our study. As per the protocol of our laboratory, blood sample for vitamin B12 was drawn.

Serum vitamin B12 levels (normal range 211-946 pg/ml) were estimated by Automated Analysers. The biochemical vitamin B12 deficiency was defined at

a concentration below <150 pg/ml. Chi-squared test or χ^2 test was used for comparing groups of data. A p value of <0.05 was taken to indicate statistical significance.

RESULTS

Table-1: Serum vitamin B12 distribution according to sex

Sex	Number
Male	34
Female	56
Total	90

Table-2: Serum vitamin B12 distribution according to dietary habits.

Diet	B12 levels <150 pg/ml	B12 levels >150 pg/ml
Vegetarian	71	79
Non-Vegetarian	19	31
Total	90	110

Table-3: Serum vitamin B12 distribution according to age

Age	B12 levels <150 pg/ml
<20	5
21-40	25
>40	60

Of the 200 people with documented B12 levels, 90 (45%) had at least one deficient result (≤150 pmol/L). So over all prevalence of B12 deficiency was 45%.

In this study Prevalence of B12 deficiency in male and female were 17% (34) and 28% (56) respectively. Prevalence of B12 deficiency in vegetarian and nonvegetarian were 35.5% and 9.5 % respectively. In our study prevalence of B12 deficiency was more in vegetarian than non-vegetarian. Prevalence of B12 deficiency in age group <20 years, 21-40 years and >41 years were 2.5%, 12.5% and 30% respectively. In this study older people (>40 years) has more prevalence than young people.

DISCUSSION

In present study, prevalence of b12 was 45% but in a study done by Gupta AK et al[12] in which B12 deficiency was 22%, which was very high compared with estimated rates in the general population (3% to 5%). In this study Prevalence of B12 deficiency in male and female were 17% (34) and 28% (56) respectively. B12 def was more in female than male but data was statically not significant but in a study done by Anil K Gupta *et al.*, [12], the rates of B12 deficiency were similar in men and women (44%/40%). Crăciun EC *et al.*, [13] showed that serum level of vitamin B12 did not differ significantly between female and male subjects. But in singh et al showed gender appeared to contribute towards the B12 deficiency according to our study, females being more prone to develop B12 deficiency (Odds ratio 0.62, 95% confidence interval 0.41 to 0.93 at 200pg/ml, p<0.05 and odds ratio 0.48, 95% confidence interval 0.29 to 0.78, p<0.05 at 350 pg/ml) [14]. Prevalence of b12 deficiency in age group <20 years, 21-40 years and >41 years were 2.5%, 12.5% and 30% respectively. In this study older people (age group >40 years) has more prevalence than young people but in a study by Singh B *et al.*, [14], in which the B12 deficient groups (< 200pg/ml as well as <350 pg/ml), majority of the subjects belonged to age groups 21-40 and 41-60 years. About 35 to 45% population belonged to this age group as compared to 15 to 18% of >60 years. We concluded that prevalence was more in older adults than young person. Prevalence of B12 deficiency in vegetarian and nonvegetarian were 35.5% and 9.5% respectively. In our study prevalence of B12 deficiency was more in vegetarian than non-vegetarian. Similar result found in Singh B *et al.*, [14] showed that Dietary data could be retrieved in 43.6% (184/422) of patients only, out of which 107 (58.2%) were vegetarians and 77 (41.8%) were non vegetarians. Vegetarian dietary habit was found to be a substantial risk factor for B12 deficiency in our population. Although a more detailed dietary analysis is indicated.

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