Vitamin B12 Status in different Age Groups

Vijaysinh Parmar¹, Parin Shah², Asha Khubchandani³, Viral Solanki⁴, Vikas Vaghela⁵, Janki Jadav⁶

³Associate Professor, ¹²⁴⁵⁶Resident Doctor, Department of Biochemistry, B. J. Medical College, Civil Hospital, Asarwa, Ahmedabad, Gujarat

ABSTRACT:
BACKGROUND: The objective of this study is to shed light on the level of vitamin B12 in Males and Females of different age groups. Vitamin B12 was determined and compared to different age groups. Also compare vitamin B12 level with males and females.

MATERIAL AND METHOD: Serum sample of 2660 patients with different age group were taken. Serum vitamin B12 level were measured in Abbott 1000sr by CMIA (chemiluminescent micro particle immunoassay) method. RESULT: The results showed that serum vitamin B12 level of elderly patients (>60 year) was significantly lower as compared to other age groups. (p value<0.05). There is no significant difference between the gender groups in serum vitamin B12 level. CONCLUSION: Role of vitamins in maintenance of health has received tremendous attention in recent times. Vitamin B12 deficiency is not just a laboratory finding but a clinically relevant issue which needs to be explored. The results of this study indicates elderly patients (>60 year) are at substantial risk to develop B12 deficiency. While there is no significant difference observed between males and female.

Key Words: Serum Vitamin B12, Chemiluminescent Micro Particle Immunoassay

INTRODUCTION
Vitamin B12 also called Cobalamin, is a water soluble vitamin with a key role in the normal function of the brain and nervous system, in DNA synthesis and for the formation of blood.¹² Vitamin B12 deficiency can lead to a wide spectrum of hematologic and neuropsychiatric disorders that can cause hyperhomocysteinemia and impaired immune system.³ Symptoms of vitamin B12 deficiency include fatigue, weakness, anorexia, paresthesias, numbness and dizziness. Early diagnosis and prompt treatment of patients in the early stage of the disorder can often produce an improvement in their condition.⁴ Vitamin B12 is absorbed from food after binding to intrinsic factor which is produced by the stomach. This vitamin B12-intrinsic factor complex is essential for the absorption of vitamin B12 in the terminal ileum.⁵ Since the main sources of vitamin B12 for humans are meat and poultry, as well as dairy products and eggs suggesting that there has been less concern about B12 deficiency among vegetarians those who eat some animal based-products.⁶ Prevalence of vitamin B12 deficiency in the general population appears to increase among elderly people.⁷ The main causes of vitamin B12 deficiency include nutritional deficiency, malabsorption syndromes, gastrointestinal causes and rare genetic disorders.¹ Absorption problems due to lack of intrinsic or intestinal factors are thought to be the most common cause of vitamin B12 deficiency.¹

MATERIAL AND METHOD
The cross sectional study was conducted in civil hospital, Ahmedabad during december 2014 to may 2015. In our study 2660 patients (n=2660) were taken. There age range between 0-96 years. The mean age of patients was found to be 7.49±17.65. Out of 2660, 1582 female and 1078 male participated in this study. The patients were diagnosed vitamin B12 deficiency depending on the results of the serum vitamin B12 level. Data of vitamin B12 level were taken from HI-J. Medical College, Civil Hospital, Ahmedabad. The supernatant blood serum was used for the analysis of vitamin B12 level in Abbott Architech 1000SR by CMIA principal.⁸

*Corresponding Author:
Dr. Asha Khubchandani
Department Of Biochemistry
11, Vidhi Banglows, New Cg Road,
Chandkheda, Ahmedabad-382424,
E-Mail: Ashakhub@Yahoo.Com
The biochemical vitamin B12 deficiency was defined at a concentration below <200 pg/ml.9,10 The effect of gender and age groups on the B12 status measurement among the subject groups were assessed for statistical significance by Graphpad Instat software. Statistical significance was taken as P value <0.05.

RESULT

Table(1) showed the results of serum Vitamin B12 level in total subjects according to sex of subjects. Out of total patients (n=2660), there is 1078 males(41%) and 1582 females.(59%) Out of 1078 male only 474 male(44%) having low serum vitamin B12 level while in female ,out of 1582 female only 712(45%) having low serum vitamin B12 leve. So there is 44% male and 45% female having low B12 level. Gender did not appeared to contributr towards the B12 deficiency according to our study.(p>0.05)

Table: 1 Level of Vitamin B12 in total subjects according to sex.

<table>
<thead>
<tr>
<th>Sex</th>
<th>No. Of patients having &lt;200 pg/ml (%)</th>
<th>No. Of patients having &gt;200 pg/ml (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>474(44%)</td>
<td>604(56%)</td>
<td>1078</td>
</tr>
<tr>
<td>Females</td>
<td>712(45%)</td>
<td>870(55%)</td>
<td>1582</td>
</tr>
<tr>
<td>Total</td>
<td>1186</td>
<td>1474</td>
<td>2660</td>
</tr>
</tbody>
</table>

Table (2) showed the results of serum Vitamin B12 level in total subjects according to different age groups. Out of total patients (n=2660), there is 944 subject having age group less than 30 years(<30) ,out of which 298 (31.5%) having low B12 level. 796 subject having age between 30 year to 60 year (30-60), out of which 313 (39.3%) having low B12 level. 920 subject having age more than 60 year(>60 ), out of which 575 (62.5%) having low B12 level. Elderly patients (>60 years ) appear to increase the risk of vitamin B12 deficiency(p <0.05).

Table. 2- Level of Vitamin B12 in total subjects according to Different Age group.

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>No. Of patients having &lt;200 pg/ml (%)</th>
<th>No. Of patients having &gt;200 pg/ml (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;30</td>
<td>298(31.5%)</td>
<td>646(68.4%)</td>
<td>944</td>
</tr>
<tr>
<td>30 to 60</td>
<td>313(39.3%)</td>
<td>483(60.6%)</td>
<td>796</td>
</tr>
<tr>
<td>&gt;60</td>
<td>575(62.5%)</td>
<td>345(37.5%)</td>
<td>920</td>
</tr>
</tbody>
</table>

CONCLUSION

In our study B12 deficiency was observed in 44% men and 45% women in the present study suggesting that risk of developing B12 deficiency is not affected by gender. This is similar to a study conducted on South Asian patients.11 In the present study a total of 920 subjects were found to be more than 60 years of age and out of that 575 (62.5%) were found to be B12 deficient (B12 <200 pg/ml). The prevalence rate observed in elderly population was higher than the total population. However it was much higher than that observed in Finnish elderly population.12 However the age seemed to offer a substantial risk for developing B12 deficiency in Indians. This could be attributed to dietary limitations due to vegetarian dietary habits and lower socio economic status.

In present study depicted that 45% of the total subjects (1186 out of 2660) had vitamin B12 deficiency (levels <200pg/ml). Although varying data have come into picture regarding prevalence, our finding is in consistency with a study where 47% of the Asian Indians had B12 deficiency confirming the high prevalence of this magnitude in Indians.11 Though this study by Gupta et al was carried out in south Indians residing in Canada 8, prevalence was quite similar to our study indicating that there are other factors beyond vegetarian diet that may possibly be responsible for this deficiency.

There is some limitation of study like it is a hospital based study, the population visiting the hospital cannot be considered representative of the Indians. A number of large population based studies are required to validate our study findings in a broader perspective. Despite these limitations,
prevalence observed in the present study was found to be highly significant and consistent with several other studies addressing the problem of vitamin B12 deficiency. However, large population based studies may provide a better outlook about the magnitude of this problem.

From our study we concluded that elderly people are at substantial risk to develop B12 deficiency. The magnitude of the prevalence of B12 deficiency estimated in our population strengthens the argument that B12 deficiency is more prevalent in elderly Indians. Hence there is a need to include screening of vitamin B12 in routine clinical set up.

REFERENCES