ORIGINAL ARTICLE

EMPIRICAL TREATMENT IN CLINICALLY DIAGNOSED CASES OF VITAMIN B12 DEFICIENCY

Pulkit Modi[1],Vikki J Parikh[2]

Author's Affiliations: [1]Assistant Professor; [2]Associate Professor Dept. of Orthopaedics, GMERS Medical College, Dharpur, Patan, Gujarat
Correspondence: Dr. Vikki J Parikh E-mail: drvikkiprkh@gmail.com

ABSTRACT

Background: Vitamin B12 deficiency may present with fatigue, weakness, numbness, decreased memory, irritability, confusion and depression, although initial symptoms might often be vague. Even though the human body can store vitamin B12 to last for up to five years, its deficiency is not very uncommon. The diagnosis is frequently made on the basis of a costly tests like low serum vitamin B12 level or megaloblastic bone marrow or both. This study was aimed to measure the effect of Empirical treatment in clinically diagnosed cases of Vitamin B12 deficiency.

Methodology: Current study was a prospective study, done in a private hospital. All patients attending OPD during July 2015 to December 2015 forms the study population.

All patients full filling inclusion criteria and willing to give informed written consent were treated with 2ml Intramuscular injection of Vit B 12 1000mcg thrice a week for total ten injections. Follow up of patients were done on weekly basis for first month, then every two weekly for next two month and then monthly basis for next three months. After this period, symptoms were reassessed and recorded.

Results: Total 90 clinically suspected patients of Vitamin B12 deficiency were willing to participate in the study. Out of total 90 patients, 39 (43.33%) patients were male and 51 (56.67%) patients were female. Out of total 90 patients, maximum number of patients i.e 31 (34.44%) were from age group of 41 to 50 years. All symptoms were significantly improved after completion of standard course of Vit B12. In out of total 90 patients having complain of generalized weakness, improvement was observed in 83 (92.22%) patients. Out of total 88 patients having complain of myalgia and 84 patients having complain of paresthesia, improvement was recorded in 76 (86.36%) and 73 (86.9%) patients respectively.

Conclusion: We conclude and recommend from the study that diagnosis based on clinical assessment is reliable. Thus, in resource poor country like India diagnosis should be advocated on symptoms of Vit B12 deficiency and empirical treatment should be suggested.

Keywords: Vitamin B12, Paresthesia, Myalgia, Depression

INTRODUCTION

Vitamin B12 is essential for synthesis of s-adenosyl methionine and is involved in the metabolism of proteins, phospholipids and neuro transmitters. Its deficiency leads to several neurological manifestations and affects all age groups.[1] Vitamin B12 deficiency may present with fatigue, weakness, numbness, decreased memory, irritability, confusion and depression, although initial symptoms might often be vague.[2,3,4]

Even though the human body can store vitamin B12 to last for up to five years, its deficiency is not very uncommon. The diagnosis is frequently made on the basis costly tests of of a low serum vitamin B12 level or megaloblastic bone marrow or both.[5,6]

Vitamin B12, apart from causing neuropsychiatric symptoms, leads to hyperhomocysteinemia and methylmalonic acidemia which can have serious health implications. Low serum vitamin B12 levels have low sensitivity and specificity in terms of tissue deficiency. Homocysteine and methylmalonic acid estimations are adjunct and aid in diagnosis of B12 deficiency but still serum vitamin B12 measurement is the extensively applied standard method by practical purposes.[7]

But all tests that diagnose Vitamin B12 deficiency are much more costly and after diagnosis had made, cost

of treatment also added. On the other hand symptoms of Vitamin B12 are having large spectrum and it can be easily suspected by experienced clinician. Even standard therapeutic dose does not have any side effect in normal individual. Thus in resource poor settings like in India, empirical therapy of Vitamin B12 without testing of Vit B12 levels or methylmalonic acid (MMA) can be advocated.

This study was aimed to measure the effect of Empirical treatment in clinically diagnosed cases of Vitamin B12 deficiency.

METHODOLOGY

Current study was a prospective study, done in a private hospital of Ahmedabad, Gujarat. All patients attending OPD during July 2015 to December 2015 forms the study population.

Inclusion criteria:

Patients full filling all of the following criteria were included in the study

1) Age >18 years.

2) Patients having at least four of the following symptoms/signs at the time of presentation. These signs/symptoms include generalized fatigue, paresthesia, myalgia, loss of appetite, confusion, tremor, labored breathing, depression.

3) Patients not having medical and surgical comorbidities that hinder vitamin B 12 absorption (e.g. Celiac disease, Crohn's disease, pernicious anemia, tuberculosis, long term use of acid reducing durgs, diabetes medication metformin users, parasite infections, people who have undergone certain surgical procedures in the gastrointestinal tract.)

4) Patients willing to give informed written consent.

Suspected depression patients were referred to psychiatric OPD to confirm the diagnosis. And those full filling inclusion criteria referred back to orthopedic dept.

Patients not giving written consent were excluded from the study without affecting routine management.

All patients full filling inclusion criteria and willing to give informed written consent were treated with 2ml Intramuscular injection of Vit B 12 1000mcg thrice a week for total ten injections. Follow up of patients were done on weekly basis for first month, then every two weekly for next two month and then monthly basis for next three months. After this period, symptoms were reassessed and recorded.

There were total 122 patients having symptoms likely of B12 deficiency and full filling inclusion criteria. Out of these, 15 patients refused to give informed written consent. Out of remaining 107 patients, 17 patients were become loss to follow up till the end of the study. Thus, total 90 patients remained in the study till the end.

Data were entered in Microsoft Excel and analysed using Epi Info software.

RESULTS

Total 90 clinically suspected patients of Vitamin B12 deficiency were willing to participate in the study. All patients were prescribed standard treatment for Vitamin B12 deficiency.

Table 1: Age and Gender wise distribution of Vit B12 deficient patients

Age	Male (%) (n=39)	Female (%) (n=9)	Total (%) (n=90)
20-30	4 (10.26)	7 (13.73)	11 12.22)
31-40	10 (25.64)	8 (15.69)	18 (20.00)
41-50	16 (41.03)	15 (29.41)	31 (34.44)
51-60	5 (12.82)	12 (23.53)	17 (18.89)
>60	4 (10.26)	9 (17.65)	13 (14.44)
Total	39 (100)	51 (100)	90 (100)

Table 2: Improvement in symptoms after completion of empirical treatment

Symptoms	Improved (%)	Not Improved (%)	Total (%)
Generalized fatigue	83 (92.22)	7 (7.78)	90 (100)
Myalgia	76 (86.36)	12 (13.64)	88 (97.78)
Paresthesia	73 (86.90)	11 (13.10)	84 (93.33)
Loss of appetite	64 (78.05)	18 (21.95)	82 (91.11)
Tremor	34 (72.34)	13 (27.66)	47 (52.22)
Confusion	28 (82.35)	6 (17.65)	34 (37.78)
Laboured breathing	8 (80.00)	2 (20.00)	10 (11.11)
Depression	5 (62.50)	3 (37.50)	8 (8.89)

Table 1 shows that out of total 90 patients, 39 (43.33%) patients were male and 51 (56.67%) patients were females. Out of total 90 patients, maximum number of patients i.e 31 (34.44%) were from age group of 41 to 50 years. Out of total 39 males, maximum number of patients i.e. 16 (41.03%) were from the age group of 41 to 50. In females also same trend was observed. Another common age groups were 31 to 40 years (20.0%) and 51 to 60 years (18.89%). Thus, it was observed that age group of 31 to 60 years attributed to 73.33% patients. This trend was common in both the gender.

Table 2 shows improvement in symptoms after completion of empirical treatment of clinically suspected patients of Vit B12 deficiency. It was observed that out of total 90 patients, all patients were having generalized fatigue. Another common symptoms were myalgia (97.78%), Paresthesia (93.33%)

and Loss of appetite (91.11%). Tremors and confusion were found in 52.22% and 37.78% patients. Least common symptom were Laboured Breathing and Depression which were found in 10 (11.11%) and 8 (8.89%) patients.

All symptoms were significantly improved after completion of standard course of Vit B12. In out of total 90 patients having complain of generalized weakness, improvement was observed in 83 (92.22%) patients. Out of total 88 patients having complain of myalgia and 84 patients having complain of paresthesia, improvement was recorded in 76 (86.36%) and 73 (86.9%) patients respectively. All other symptoms were also significantly improved after completion of treatment.

DISCUSSION

The deficiency state has a very wide presentation and can cause or exacerbate neuropsychiatric and other vague symptoms. In early stage vitamin B12 deficiency might present with subtle and slight cognitive impairments. Hence early recognition becomes crucial for preventing irreversible damage.

Our study stated that 41 to 50 years of age group was the most common age group. It is contrary to other studies which documented that patients having age of > 60 years are most commonly affected. [8] This indicates the changing trend in age group of Vit B12 deficiency. This finding needs to further research. A few other investigators have also refuted age associated decline of vitamin B12 levels.[9-12]

Our study shows female preponderance among patients of Vit B12 deficiency. Same finding were reported by many studies. [8,10,11]

Vitamin B 12 deficiency is common in our country especially in vegetarian population. Many centers in our country still have no facility to estimate serum Vitamin B 12 and very costly in private health sector. We had seen in our results that after giving Inj. Vit B 12 empirically in clinically suspected vitamin B12 patients all the symptoms were significantly improved after completion of standard course of Vit B12. Out of total 90 patients, around 86% patients improvement of all symptoms were recorded after completion of treatment.

CONCLUSION & RECOMMENDATION

Females were commonly affected with Vit B12 deficiency. Diagnosis based on clinical assessment is reliable. Thus, in resource poor country like India diagnosis should be advocated on symptoms of Vit B12 deficiency and empirical treatment should be suggested.

REFERENCES

1. Healton EB, Savage DG, Brust JC, Garrett TJ, Lindenbaum J. Neurologic aspects of cobalamin deficiency. Baltimore: Medicine 1991, 70: 229-45.
2. Oh R, Brown DL. Vitamin B12 deficiency. Am Fam Physician 2003, 67(5): 979–86.
3. Mezzano D, Kosiel K, Martinez C, Cuevas A, Panes O, Aranda E et al. Cardiovascular risk factors in vegetarians: normalization of hyperhomocysteinemia with vitamin B(12) and reduction of platelet aggregation with n-3 fatty acids. Thromb Res 2000, 100:153-60.
4. Herrmann W, Schorr H, Purschwitz K, Rassoul F, Richter V. Total homocysteine, vitamin B12 and total antioxidant status in vegetarians. Clin Chem 2001, 47:1094-1101.
5. Misra UK, Kalita J, Das A. Vitamin B12 deficiency neurological syndromes: A clinical, MRI and electrodiagnostic study. Electromyogr Clin Neurophysiol 2003, 43:57-64.
6. Pandey S, Kalita J, Misra UK. A sequential study of visual evoked potential in patients with vitamin B12 deficiency neurological syndrome. Clin Neurophysiol 2004, 115:914-918.
7. Clarke R. B-vitamins and prevention of dementia. Proc Nutr Soc 2008;67:75-81.
8. Saritaben Mangukiya, Bhautik Modi, Pallavi Chaurasia, Krushna Modi, Rita M Shah. Distribution of Vitamin B12 Level According to Socio-Demographic Characteristics in Patients of Dhiraj General Hospital, Pipariya, Gujarat. National Journal of Medical Research 2011: 1 (2); 54-56
9. Wolters M, Strohle A, Hahn A. Cobalamin: a critical vitamin in the elderly. Prev Med 2004;39:1256-66.
10. Bjorkegren K, Svardsudd K. Reported symptoms and clinical findings in relation to serum cobalamin, folate, methylmalonic acid and total homocysteine among elderly Swedes: a population-based study. J Intern Med 2003;254:343-52.
11. Schneede J, Ueland PM. Novel and established markers of cobalamin deficiency: complementary or exclusive diagnostic strategies. Semin Vasc Med 2005;5:140-55.
12. Hitzhusen JC, Taplin ME, Stephenson WP, Ansell JE. Vitamin. B12 levels and age. Am J Clin Pathol 1986; 85 : 32-6.