



## Study of Vitamin B12 Levels among Vegetarians in DAE Hospital

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### Introduction

Among 10% of the population in India are vegetarians. Lacto vegetarians are more predominant in India. Vitamin B12, a water soluble vitamin is found in substantial amount in animal foods and scarce in plant foods. Thus supplementation with Vitamin B12 is needed to meet the demands. Lower cobalamin levels leads to increased MCV and anemia, also neuropathy as vitamin B12 is required for glial cell synthesis and myelin formation. It also plays a part in malabsorption. Cobalamin deficiency varies in age group and older (more than 60 years) are more affected according to Indian data. vitamin B12 deficiency is more prevalent in males than females. Pregnant women are more affected than nonpregnant females and in children boys are affected more than girls. Overall mortality and morbidity in B12 deficiency accounts for 15% of population

**Target population:** About 60 vegetarians who presented at Department of atomic energy hospital.

**Aim of the study:** To study the vitamin B12 levels among vegetarians who presented to DAE hospital from the period Mar 2021 –Feb 2022. The

main purpose is to understand the prevalence of serum vitamin B12 deficiency among vegetarians.

### Materials and Methods

Retrospective observational study was conducted among of symptom analysis 60 vegetarians and their B12 levels, who presented at DAE hospital during the period Mar 2021 – Feb 2022 have been done. Those people who are on Tab. metformin were excluded (as it hampers absorption of B12).

### Inclusion Criteria

All vegetarians of all age groups, apparently healthy (not immunocompromised and not on steroids), no severe B12 deficiency and not on supplementation

### Exclusion Criteria

Pregnancy, lactation, DM patients on tablet metformin

### Results and Discussion

In our study, twenty nine patients were male and thirty one patients were females. Out of the sixty patients reported, only sixteen had normal Vitamin B12 levels and fifty four subjects were below 60 years of age and twelve of them from rural background forty eight were from urban. This has been illustrated in Figure-1.

Figure-1: Overall prevalence according to age, sex, locality

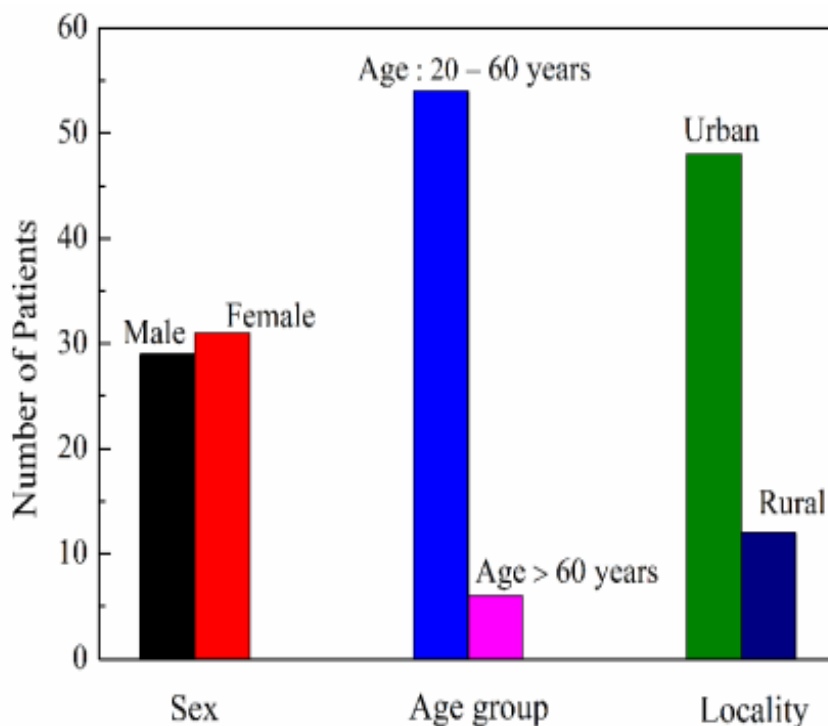
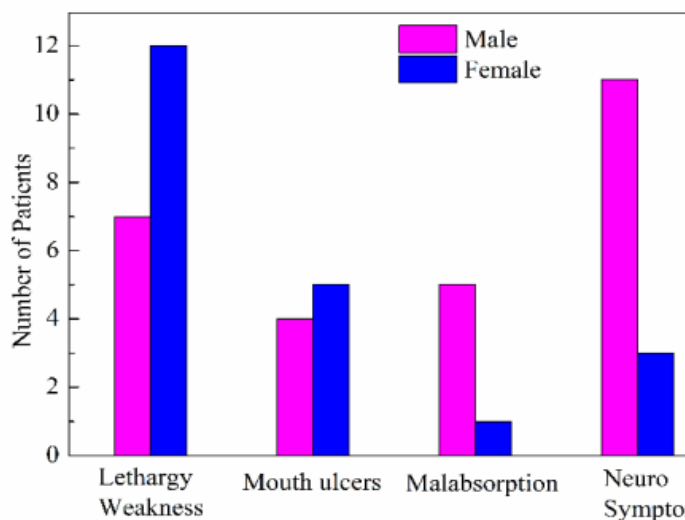
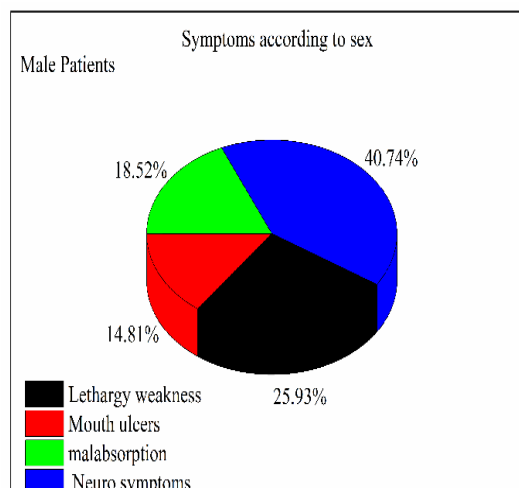


Table 1: Prevalence of symptoms according to sex

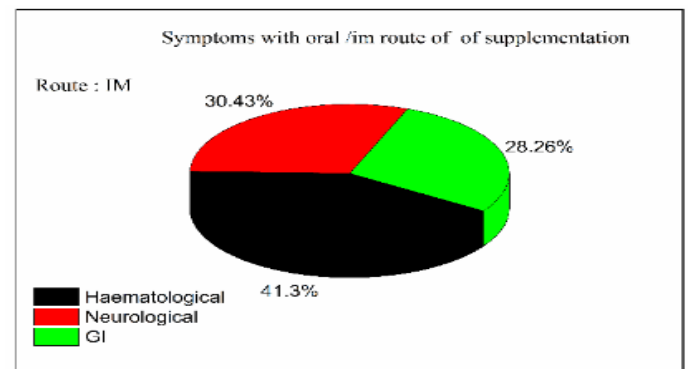
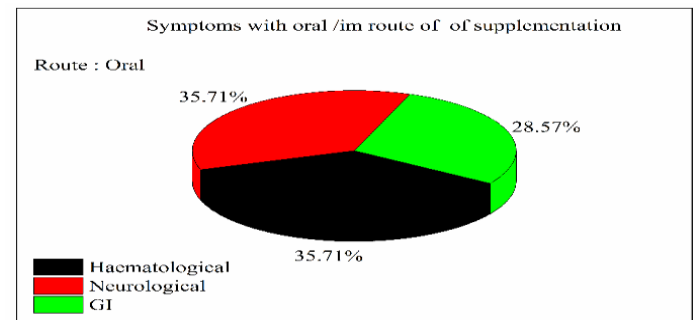
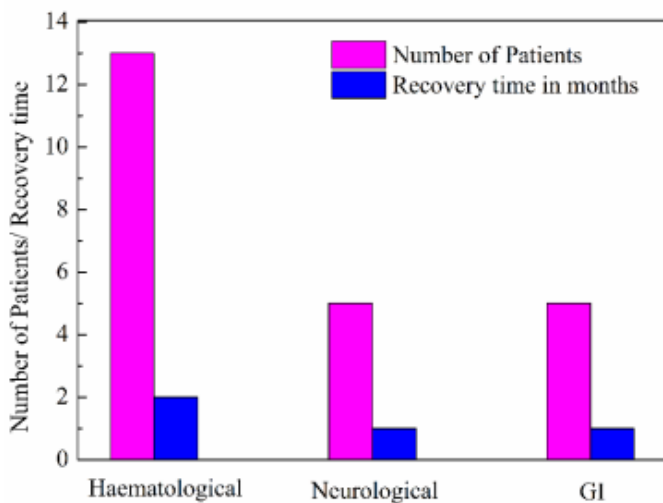
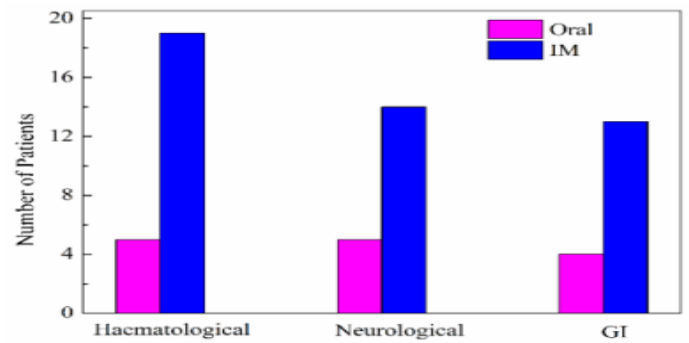
Sex	Lethargy weakness	Mouth Ulcers	Malabsorption	Neuro symptoms	Dermatological Symptoms
Male	7	4	5	11	Nil
Female	12	5	1	3	Nil

Symptomatically out of sixty study participants, most patients had hematological and neurological symptoms. Six subjects had gastrointestinal symptoms, eleven had mouth ulcers and none had dermatological manifestations as illustrated.



In our study, female patients had less B12 levels than male patients which is different from national data. The prevalence of symptoms like weakness, myalgia, neuropathy were in mixed preponderance, while prevalence of symptoms like malabsorption showed male preponderance (fig 1).

About five of them improved with neurological and thirteen with hematological symptoms in short follow up. Morbidity rate was observed to be more in males than females in line with national data, The time duration for initiation of reversal of hematological and neurological, gastrointestinal symptoms in these patients were 2 months and one to one and half months respectively.



The symptoms resolved fast with intramuscular route of supplementation than oral (as 41 received intramuscular route and 19 were on oral route of supplementation) fig 5. But individually both routes are efficacious in line with national data.

**Table 2:** Prevalence of different symptoms in pts -- hematological symptoms were more prevalent

Haematological	Neurological	Malabsorption	Mouth ulcers	Dermat
24	19	6	11	Nil

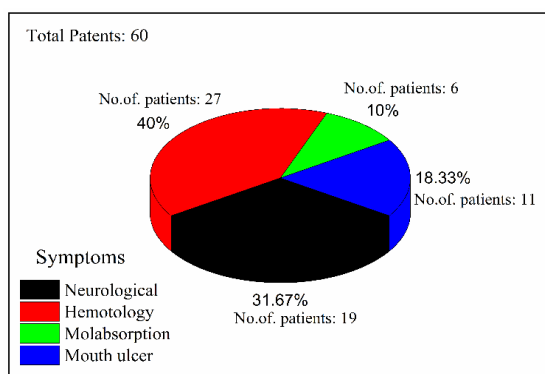


Fig 2a

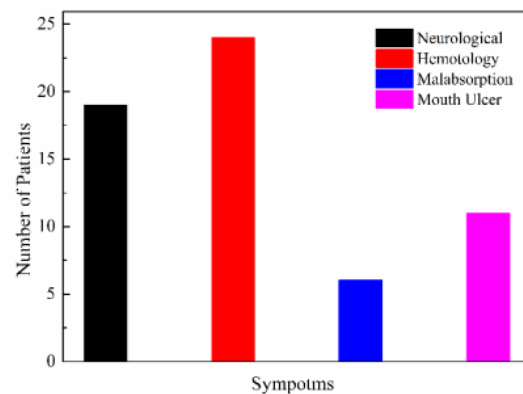


fig 2b

**Table 3** Prevalence of symptoms according to age- young patients were more symptomatic

Age	Lethargy Weakness	Mouth ulcers	Malabsorption	Wt loss	Neuro symptoms	Dermat Symptoms
<60yrs	23	11	5	1	12	0
>60 yrs	1	0	1	0	6	0

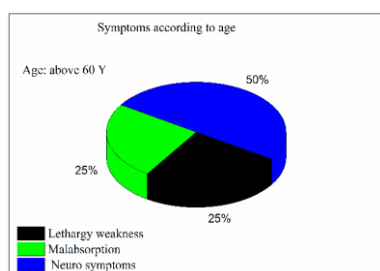


Fig 3a

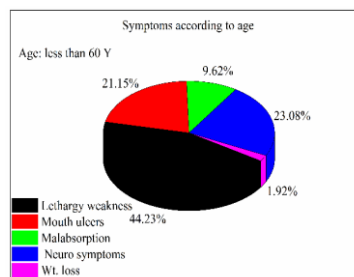


Fig 3a

**Table 4** Prevalence of symptoms according to locality-urban patients were more symptomatic

Locality	Haematological	Neurological	GI
Rural	3	4	5
Urban	24	11	12

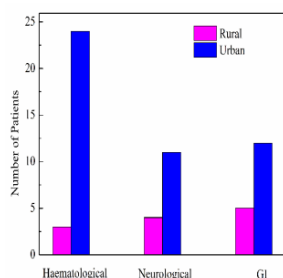


Fig 4a

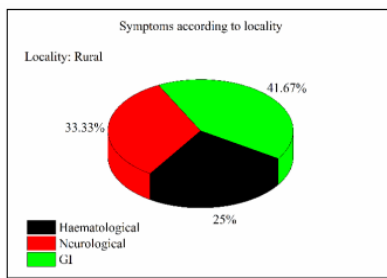


Fig 4b

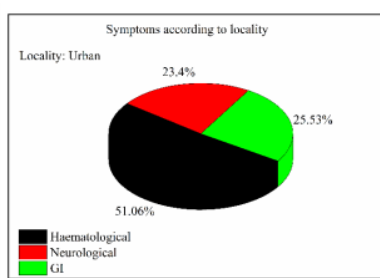


Fig 4c

**Table 5** Number of patients with symptoms received oral /im route of supplementation-parenteral route was received by more patients than oral

Route	Haematological Symptoms	Neurological Symptoms	GI Symptoms
Oral	6	5	4
Im	20	11	14

Number of patients with symptoms according to route of administration

**Table 6** Recovery time in months of symptoms-hematological symptoms took long time for recovery

Symptoms	Haematological patients	Neurological patients	Gi symptoms patients
Recovery time	13 patients 60 days ( 2mths)	5 patients 45 days	5 patients 30 days

Comparison with National trend: In our study, there is female preponderance vitamin B12 deficiency is concerned which is not in line with the national study [Ref 1]. The most commonly affected age group in our study is young and middle aged (20–59 years) where as in national

study it is more in age group of 60 years. In our study, also neurological (8%) and lethargy weakness (20%), malabsorption in about 5% are more prevalent in males as compared to females which is in line with national study (ref 4). None had dermatological manifestations. Malabsorption

were more prevalent in <60 yr males in our study compared to more prevalence in elderly males according to nejm study (Ref 1).

Comparison with International trend: Neurological symptoms, hematological, malabsorption were more of young age group predominance in our study (fig3). But more of old age group predominance in international study (ref 2). The dermatological symptoms were none in our study but more in females than males in international study.

**Implications for the community:** Patients (vegetarians) presenting with vitamin B12 deficiency suffer from a burden of symptoms and mainly recognition of symptoms earlier and their management with early supplementation can reduce the morbidity and mortality. By studying the prevalence of B12 deficiency according to age, sex, locality and efficacy of routes of administration of vitamin B12, we can apply the same to our community and thus morbidity of vitamin b12 deficiency can be reduced.

### Conclusion

In our study females are affected more than males and in younger age group (<60 yrs) .Time duration for reversal of symptoms was faster with neurological than haematological symptoms and it was also observed that the reversal was fast with injectable than oral route. In our country overall morbidity accounts for about 15%.So early supplementation with recognition of symptoms helps in reducing the same. Dietary advice for vitamin B12 rich foods like curd, spinach, milk products like cheese, fortified cereals like corn flakes, bran etc will amplify the efficacy of supplementation (oral or im routes) as both routes are efficacious individually.

### References

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