



## Screening and Prevalence of Vitamin B12 deficiency among pregnant women

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### ABSTRACT

**Background:** Vitamin B12 deficiency is considered to be an important cause of anaemia. The aim of this study is to evaluate the prevalence of vitamin B12 deficiency in patients attending our hospital so as to help formulate a policy for the supplementation of the same.

**Methods:** This was a cross sectional study conducted in SMGS Jammu done in May 2023. About 500 pregnant females visiting the antenatal OPD in any age of gestation were included in the study. They were subjected to a blood test of Vitamin B12 levels. The prevalence of Vitamin B12 deficiency was calculated from the data.

**Results:** The prevalence of vitamin B12 deficiency was found to be 56.6%. It was found to be higher in women with low education status, more in homemakers than working women, more in lower socioeconomic status than higher, more in first trimester and primigravida.

**Conclusions:** The prevalence of vitamin B12 deficiency is high in pregnancy in Indian population. Therefore it is important to supplement vitamin B12 to treat anaemia in Indian population and for its other bodily functions.

**Keywords:** Anaemia, Vitamin B12, prevalence.

### INTRODUCTION

Vitamin B12 is an important micronutrient among all other vitamins as it has a considerable effect in various bodily functions. It helps in the formation of red blood cells and is also essential for the normal functioning of the nervous system and brain. Along with folic acid, Vitamin B12 is needed for fatty and amino acid metabolisms and DNA synthesis and also plays a significant role in the conversion of homocysteine to methionine (1) which is required for the synthesis of neurotransmitters and phospholipids. (2) Vitamin B12 is an essential vitamin and is mainly found in non vegetarian diet (3) Indian population, with largely vegetarian food habit, is more prone to harbour deficiency of vitamin B12. (4)

During pregnancy, nutritional needs of female are increased. The Indian Council of Medical Research recommends a dietary intake of 1 µg/day of Vitamin B12 for adults and 1.5 and 1.2 µg/day for pregnancy and lactation, respectively.(5)

The deficiency of vitamin B12 is considered to be an important cause of anaemia in pregnancy. Though its deficiency is quite prevalent, the current health policy is to supplement only iron and folic acid for the prevention of anaemia. This study is done to evaluate the prevalence of vitamin B12 deficiency in patients attending our hospital so as to formulate a policy for its supplementation for the health of the mother and the offspring.

### METHODS AND MATERIALS

This was a cross sectional study performed in GMC Jammu. A total of 500 pregnant women visiting antenatal OPD were included in the study. All the patients were subjected to a blood test of vitamin B12 and haemoglobin in the hospital laboratory. The normal levels of vitamin B12 are 200-900 pg/ml ,hence a cut off of vitamin B12 levels <200 pgm/ml was taken as

deficient. All patient's demographic data was noted and analysed. The prevalence of vitamin B12 deficiency and the associated risk factors were studied.

### INCLUSION CRITERIA

1. pregnant females
2. any period of gestation

### EXCLUSION CRITERIA

1. Patients taking anti epileptic medications, methotrexate, antacids, vitamin B12 supplements.
2. Patients not willing for the study.

### RESULTS

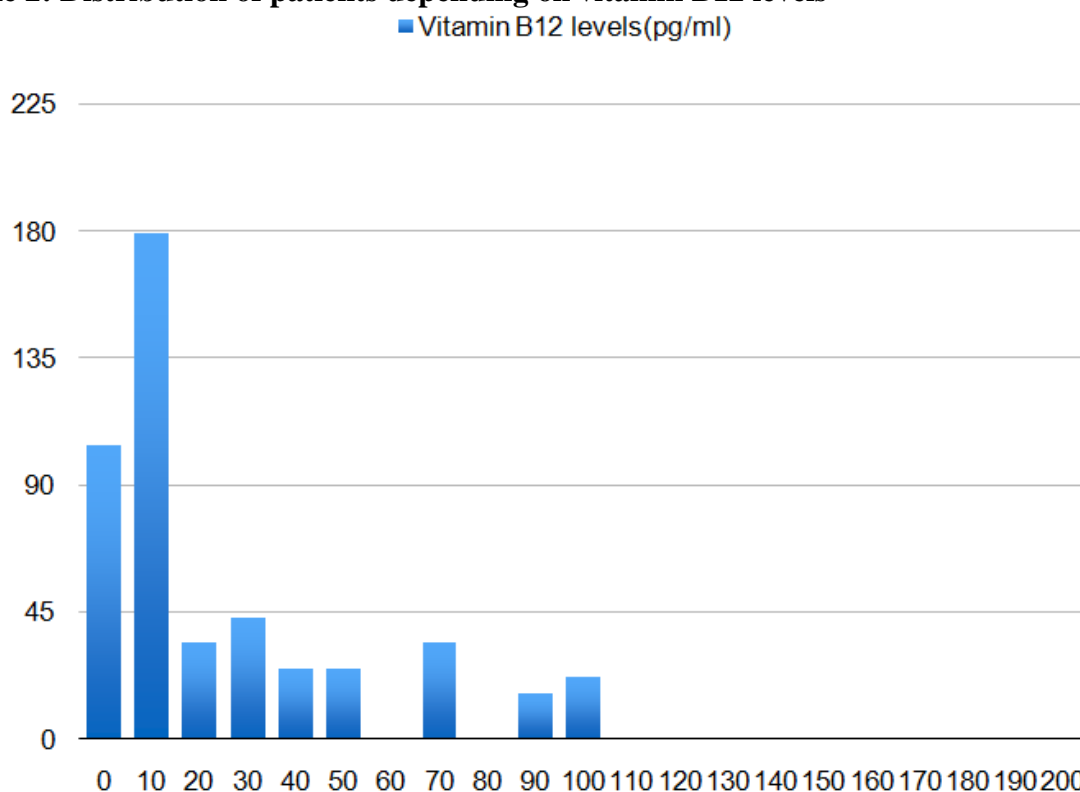
A total of 500 pregnant were included in the study. 283 patients were found to have vitamin B12 levels less than 200pg/dl. So the prevalence of deficiency was 56.6%.

**Table 1 . Demographic distribution of the patients with vitamin B12 deficiency**

		Number of patients	Percentage of patients
<b>Age(years)</b>	<25	40	14.13%
	25-30	85	30%
	30-35	94	33.2%
	>35	63	22.2%
<b>Education</b>	<high school	202	71.37%
	>higher secondary	81	28.62%
<b>Occupation</b>	Homemaker	181	63.9%
	Working	102	36.0%
<b>Obstetric history</b>			
<b>Gestational age</b>	First trimester	120	42.4%
	Second trimester	82	28.9%
	Third trimester	81	28.62%
<b>Parity</b>	Primigravida	102	36.04%
	Multigravida	181	63.9%

Among the demographic data, 30-35 years was the predominant age group with vitamin B12 deficiency: deficiency was more prevalent among the patients with education level less than high school; more among homemakers than working women; more in patients; more in primigravida than multigravida and maximum during the first trimester.

**Table 2: Distribution of patients depending on vitamin B12 levels**



The above chart shows the distribution of patients with deficiency of vitamin B12 and their levels. Maximum patients with deficiency had levels between 10-20 pg/ml.

## DISCUSSION

In our study, the prevalence of vitamin B12 deficiency came out to be 56.6%. Different reports have reported a general prevalence ranging from 16% to 77% (6,7,8). During pregnancy, the deficiency of vitamin B12 has been estimated to have a prevalence of 43% to 74%. (9) High prevalence of Vitamin B12 deficiency (56.6%) among pregnant mothers observed by us is similar to studies previously published from a semiurban area in Bangalore, (10) with a prevalence of 51% and in Pune (11) among rural and urban pregnant women, with 80% and 65% prevalence of Vitamin B12 deficiency, respectively. Main source of vitamin B12 is of animal origin. (12) Strict vegetarians, women from low socio-economic status, those suffering from malabsorption syndrome, those taking drugs like proton pump inhibitors are deficient in this vitamin.

Among the demographic factors, the deficiency was more prevalent in low education level, lower socio economic status and more in homemakers than working women. This could be attributed to the nutritional status and also awareness about proper nutrition. Another association was found to be higher in first trimester than subsequent trimesters. The reason could be poor nutrition and food intake in first trimester because of morning sickness. Vitamin B12 deficiency was also found to be higher in multigravida than primigravida because of depleting stores in repeated pregnancies.

Data also shows very low prevalence of vitamin B12 deficiency in western population. Analysis of data from the National Health and Nutrition Examination Survey, 1999-2006 by Reinstaller et al. revealed that prevalence of vitamin B12 deficiency (defined as Vitamin B12

<200 pg/ml (148 pmol/l)) in general population in United States of America is 3.3%.<sup>(13)</sup> In the western population, the underlying cause of vitamin B12 deficiency is considered to be intrinsic factor deficiency and malabsorption of oral vitamin B12<sup>(14)</sup>. Therefore there are uniform guidelines of treating vitamin B12 deficiency with injectable preparations or very high doses of oral methylcobalamin in western literature. However, deficiency in India seems largely due to diet being deficient in vitamin B12 because of vegetarian diet<sup>(15)</sup>. This difference may have therapeutic implications in Indian population. In India, oral supplementation with low doses of methylcobalamin may be sufficient and thus injectable or oral high dose therapy may not be required.

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