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Original Research

Assessment of vitamin B 12 deficiency among pregnant women

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ABSTRACT:

Background: Vitamin B12 is a water-soluble micronutrient, which helps in the formation of red blood cells and is also essential for the normal functioning of the nervous system and brain. The study was conducted to assess vitamin B 12 deficiency among pregnant women. **Materials & Methods:** 118 pregnant women in age ranged 18-30 years were taken in study. A 5 ml blood sample was obtained to check for serum Vitamin B12 levels and hemoglobin. Vitamin B12 <200 pgm/ml was taken as deficient. **Results:** Age group 18-22 years had 50, 22-26 years had 40 and 26-30 years had 28 subjects. Education was higher school in 35 and 40, secondary school in 25 and 18, high risk pregnancy was seen in 36 and 30. Clinical features were fatigue in 54 and 40, pallor in 40 and 32, angular stomatitis in 32 and 30 and premature graying in 34 and 27. Consanguinity was present in 32 and 30. Consumption of RO water was seen among 26 and 22, family history was present in 22 and 18 in deficient and normal subjects. The difference was significant (P< 0.05). **Conclusion:** Vitamin B12 deficiency among pregnant women was high. Common risk factors were Consanguinity, family history and consumption of RO water.

Key words: Consanguinity, Vitamin B12, RO water

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INTRODUCTION

Vitamin B12 is a water-soluble micronutrient, which helps in the formation of red blood cells and is also essential for the normal functioning of the nervous system and brain.[1] 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, which is required for the synthesis of neurotransmitters and phospholipids.[2] It is naturally produced by microbial synthesis, and the main dietary sources are of animal origin.[3] Other important sources are fermented foods and uncooked plant-based food contaminated with B12 producing bacteria or algae.[4] Heightened suspicion is warranted in women with risk factors for B12 deficiency, including obesity, prior bariatric surgery, inflammatory bowel disease, Helicobacter pylori infection, use of metformin or proton pump inhibitors, and certain vegan diets. Severe B12 deficiency may also result from pernicious anemia, which is caused by intrinsic factor blocking antibodies that interfere with B12 absorption.[5]

In pregnancy, B12 deficiency may go unrecognized if anemia is mistakenly attributed to other causes such as iron deficiency or physiologic hemodilution. When severe B12 deficiency goes untreated, it can have profound effects, including severe anemia, peripheral neuropathy, cognitive decline, and a variety of neuropsychiatric manifestations.[6] It may also manifest with microangiopathic hemolytic anemia and thrombocytopenia, mimicking other thrombotic microangiopathy (TMA) disorders such as atypical hemolytic uremic syndrome (aHUS), hemolysis, elevated liver enzymes, low platelet count (HELLP) syndrome.[7] The study was conducted to assess vitamin B 12 deficiency among pregnant women.

MATERIALS & METHODS

The present study comprised of 118 pregnant women in age ranged 18-30 years. All were made aware of the study and their written consent was obtained.

Demographic data such as name, age etc. was recorded. A structured questionnaire which included a 24-hours dietary recall was administered. A 5 ml

blood sample was obtained to check for serum Vitamin B12 levels and hemoglobin. Estimation of Vitamin B12 was done. Vitamin B12 <200 pgm/ml was taken as deficient. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

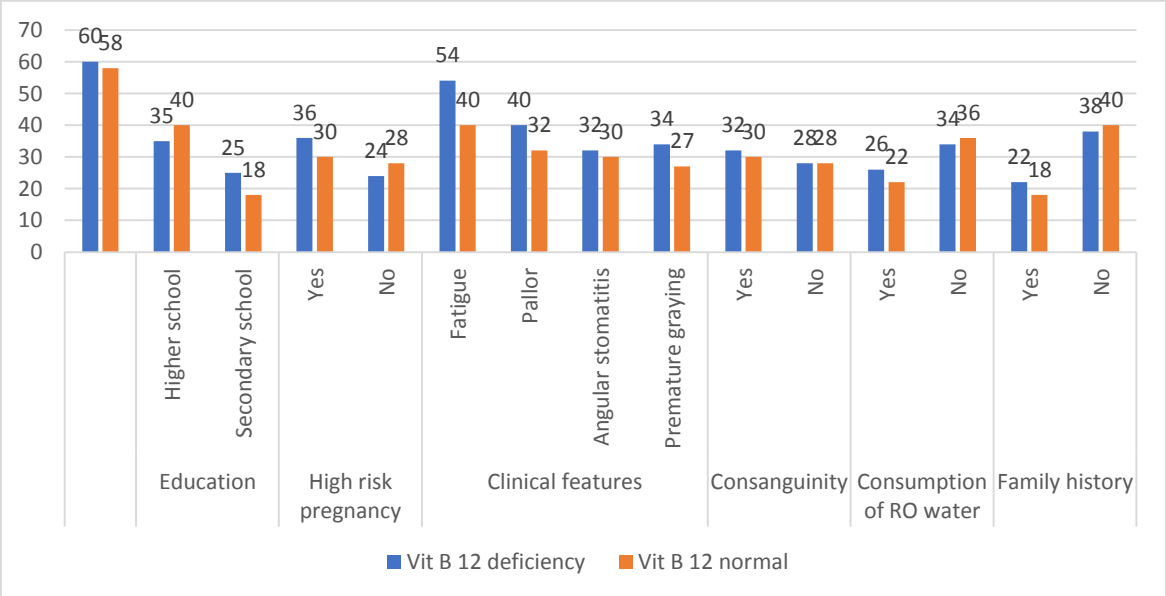
Age group (years)	Number	P value
18-22	50	0.05
22-26	40	
26-30	28	

Table I shows that age group 18-22 years had 50, 22-26 years had 40 and 26-30 years had 28 subjects.

Table II Assessment of parameters

Parameters	Variables	Vit B 12 deficiency 60	Vit B 12 normal 58	P value
Education	Higher school	35	40	0.05
	Secondary school	25	18	
High risk pregnancy	Yes	36	30	0.90
	No	24	28	
Clinical features	Fatigue	54	40	0.05
	Pallor	40	32	
	Angular stomatitis	32	30	
	Premature graying	34	27	
Consanguinity	Yes	32	30	0.81
	No	28	28	
Consumption of RO water	Yes	26	22	0.04
	No	34	36	
Family history	Yes	22	18	0.02
	No	38	40	

Table II, graph I shows that education was higher school in 35 and 40, secondary school in 25 and 18, high risk pregnancy was seen in 36 and 30. Clinical features were fatigue in 54 and 40, pallor in 40 and 32, angular stomatitis in 32 and 30 and premature graying in 34 and 27. Consanguinity was present in 32 and 30. Consumption of RO water was seen among 26 and 22, family history was present in 22 and 18 in deficient and normal subjects. The difference was significant (P< 0.05).



DISCUSSION

During pregnancy, mother needs more nutrients, especially micronutrients. 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.[8] Fast and processed food intake and decreased consumption of fruits, vegetables, and meat lead to micronutrient deficiencies. In pregnancy, it leads to adverse outcomes.[9] Mild vitamin B12 defciency is common in

pregnancy and due to increased fetal demand over gestation, 38% of women have low B12 levels by the time of delivery. Early recognition is critical because low B12 levels in pregnancy have been associated with neural tube defects, preterm birth, and low neonatal birthweight.[10] The study was conducted to assess vitamin B 12 deficiency among pregnant women.

In present study, age group 18-22 years had 50, 22-26 years had 40 and 26-30 years had 28 subjects. Rogne et al[11] evaluated the associations between maternal serum or plasma B12 concentration in pregnancy and offspring birth weight and length of gestation. Twenty-two eligible studies were identified (11,993 observations). Eighteen studies were included in the meta-analysis (11,216 observations). No linear association was observed between maternal B12 levels in pregnancy and birth weight, but B12-deficiency (<148 pmol/L) was associated with an increased risk of newborn low birth weight (adjusted risk ratio (RR) 1.15 (95% confidence interval (CI) 1.01, 1.31)). There was a linear association between maternal levels of B12 and preterm birth (adjusted RR for preterm birth was 0.89 per one standard deviation increase in B12). Accordingly, B12-deficiency was associated with increased risk of preterm birth. Lower maternal B12 in pregnancy increased the risk of preterm birth. This finding supports the conduct of randomized controlled trials of vitamin B12 supplementation in pregnancy.

We found that education was higher school in 35 and 40, secondary school in 25 and 18, high risk pregnancy was seen in 36 and 30. Clinical features were fatigue in 54 and 40, pallor in 40 and 32, angular stomatitis in 32 and 30 and premature graying in 34 and 27. Consanguinity was present in 32 and 30. Consumption of RO water was seen among 26 and 22, family history was present in 22 and 18 in deficient and normal subjects. Barney et al[12] assessed the prevalence of Vitamin B12 deficiency and its associated factors among pregnant women of rural South India. A cross‐sectional study was conducted to recruit consecutive 120 multigravida women with ≤20 weeks of gestation, attending the mobile doctor run clinic of Kaniyambadi block, Vellore. A structured questionnaire was administered, and blood samples were collected. Results: The prevalence of Vitamin B12 deficiency (<200 pgm/ml) and anemia (Hb ≤10.5 g/dL) was 55% and 17.5%, respectively. Only 11.7% were B12 deficient and anemic. Past history of abortion (odds ratio [OR] = 0.5), fatigue (OR = 0.4), and low B12 intake (OR = 2) was associated only in the bivariate analysis. First trimester (OR = 3.9) and obesity (OR = 9.6) were found to be independent risk factors of Vitamin B12 deficiency.

Rifas et al[13] examined the changes in dietary intake from the first to the second trimester of pregnancy found that intake of many micronutrient intakes increased substantially from the first to the second trimester. The increased requirement of Vitamin B12 coupled with decreased intake in the first trimester due to reasons such as morning sickness could have resulted in the increased odds of Vitamin B12 deficiency in the first trimester.

CONCLUSION

Authors found that vitamin B12 deficiency among pregnant women was high. Common risk factors were Consanguinity, family history and consumption of RO water.

REFERENCES

1. Sukumar N, Rafnsson SB, Kandala NB, Bhopal R, Yajnik CS, Saravanan P. Prevalence of vitamin B-12 insufficiency during pregnancy and its effect on offspring birth weight: A systematic review and meta-analysis. Am J Clin Nutr 2016;103:1232-51.
2. Gille D, Schmid A. Vitamin B12 in meat and dairy products. Nutr Rev 2015;73:106-15. 5. Watanabe F, Yabuta Y, Tanioka Y, Bito T. Biologically active vitamin B12 compounds in foods for preventing deficiency among vegetarians and elderly subjects. J Agric Food Chem 2013;61:6769-75.
3. Just MJ, Kozakiewicz M. Depressive disorders co-existing with addison-biermer anemia – Case report. Neuropsychiatr Dis Treat 2015;11:1145-8.
4. Ingole JR, Patel RD, Ingole SJ, Pandave HT. Opportunistic screening of Vitamin B12 deficiency in IT professionals presenting for routine health check-up. J Clin Diagn Res 2015;9:OC01-2.
5. Pawlak R, Parrott SJ, Raj S, Cullum-Dugan D, Lucus D. How prevalent is vitamin B (12) deficiency among vegetarians? Nutr Rev 2013;71:110-7.
6. Jeruszka-Bielak M, Isman C, Schroder TH, Li W, Green TJ, Lamers Y. South Asian ethnicity is related to the highest risk of Vitamin b12 deficiency in pregnant Canadian women. Nutrients 2017;9(4):317.
7. Wang ZP, Shang XX, Zhao ZT. Low maternal vitamin B (12) is a risk factor for neural tube defects: A meta-analysis. J Matern Fetal Neonatal Med 2012;25:389-94.
8. Christian AM, Krishnaveni GV, Kehoe SH, Veena SR, Khanum R, Marley-Zagar E, et al. Contribution of food sources to the vitamin B12 status of South Indian children from a birth cohort recruited in the city of Mysore. Public Health Nutr 2015;18:596-609.
9. Lowensohn RI, Stadler DD, Naze C. Current concepts of maternal nutrition. Obstet Gynecol Surv 2016;71:413-26.
10. Remacha AF, Sardà MP, Canals C, Queraltò JM, Zapico E, Remacha J, et al. Combined cobalamin and iron deficiency anemia: A diagnostic approach using a model based on age and homocysteine assessment. Ann Hematol 2013;92:527-31.
11. Rogne T, Tielemans MJ, Chong MF, Yajnik CS, Krishnaveni GV, Poston L, Jaddoe VW, Steegers EA, Joshi S, Chong YS, Godfrey KM. Maternal vitamin B12 in pregnancy and risk of preterm birth and low birth weight: A systematic review and individual participant data meta-analysis. American journal of epidemiology. 2017 Feb 1;185(3):212.
12. Barney AM, Abraham VJ, Danda S, Cherian AG, Vanitha S. Prevalence of Vitamin B12 deficiency and its associated risk factors among pregnant women of

rural South India: A community-based cross-sectional study. Indian J Community Med 2020;45:399-404.
13. Rifas-Shiman SL, Rich-EdwardsJW, WillettWC, Kleinman KP, Oken E, Gillman MW. Changes in dietary intake from the first to the second trimester of pregnancy. Paediatr Perinat Epidemiol 2006;20:35-42.