Vitamin B12 and folate status during healthy pregnancy

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Objective

Folate and vitamin B12 are essential vitamins for fetal development. They play role in DNA biosynthesis and homocystein mechanism. In the deficiency of these vitamins, megaloblastic anemia, hyperhomocystenemia and neurological disorders could be seen. In addition to that, B12 and folate are essential for neuronal tube development. World Health Organization (WHO) recommends folate supplementation up to end of first trimester. However, folate and B12 levels have not been studied in Turkish population in pregnancy. In the current sequential study, our primary objective was to determine normal reference values for folate, vitamin B12 and homocystein in Turkish pregnant women who did not use any supplementation during pregnancy.

Methods

Between January-2015 and May-2016, all healthy 18-40 year-old, first trimester pregnant women admitted to our department for routine pregnancy follow up were recruited. The exclusion criteria were multiple pregnancy, obstetric complications such as hypertensive disorder, gestational diabetes or moderate anemia, maternal chronic diseases such as kidney or liver problems, use of any multivitamin or iron supplement. Blood samples were collected in standard fashion in between 8-12 week, 22-26 week and 32-36 week. Vitamin B12 and ferritin were analyzed. Statistical analyses were performed by SPSS v21.0 (IBM SPSS Inc., Chicago, IL). For comparing three trimester Kruskal-Wallis and Wilcoxon Signed Rank Test were used. Significance value was set at 0.05.

Results

One hundred and sixty four women were included during the study period. The 10th percentiles for vitamin B12 and folate values for first, second and third trimesters were 202-168-130/ 8.7-7.4-6.3, respectively. The 10th and 90th percentiles for homocystein between trimesters were 4.0-14.0/ 2.3-10.0/ 2.5-15.0, respectively. Vitamin B12, folate and homocystein values were statistically significant between trimesters ($p<0.001$). In addition to that, Vitamin B12, folate and homocystein decreased significantly from first to second trimester ($p<0.001$, $p<0.001$, $p<0.001$, respectively) but stayed comparable between second and third trimester ($p=0.779$, $p=0.496$, $p=0.763$, respectively) (Table 1).

Conclusion

In this study reference intervals for certain hematologic variables of healthy pregnancy without using any supplementation are updated. In deficiency of vitamin B12 and folate, elevation of plasma homocystein levels is expected. However, in our study, all of three parameters decreased between first and second trimester. The result could be due to physiologic haemodilution. Although in our study, the values were statistically comparable between second and third trimester, vitamin B12 and folate levels slightly decrease but homocystein levels slightly increased. Further studies with larger patient group must be planned in order to reach more informative conclusions.