# IRON, FOLATE AND VITAMIN B12 LEVELS IN PREGNANT WOMEN AND EFFECT OF IM IRON, FOLATE AND VITAMIN B12 THERAPY ON IRON, FOLATE AND VITAMIN B12 LEVELS

Anaemia in pregnancy was recognized as a major public health problem leading to high maternal morbidity and mortality and low birthweight and high infant mortality. As anaemia was shown to be mainly due to iron and folic acid deficiency, the national programme aimed at providing iron and folic acid supplementation during pregnancy. Recent nationwide surveys show that the high prevalence of pregnancy anaemia has not declined for the last 5 decades. This is mainly due to the fact that screening for and appropriate treatment of anaemia envisaged in the National Anemia Control Programme had not been operationalised and coverage and compliance with oral iron folic acid supplementation is poor. Numerous studies including ICMR task force studies have shown that 90 tablets of iron and folic acid intake results in prevention of the deterioration of Hb but do not result in significant improvement in Hb levels. Studies carried out by NFI had indicated that even after IM injection of 1500 mg iron as iron sorbital citric acid complex majority of the women had Hb levels below 11 g/dl . Some of the recent studies have indicated that vitamin B12 deficiency may play an important role in anaemia.

The project had two components Component 1 objectiveto investigate iron, folate and vitamin B12 status in pregnant women with different grades of anaemia and Component 2 objective to assess the impact of intra-muscular iron, folic acid and vitamin B12 injections on indicators of iron, folic acid and vitamin B12 status in pregnant women with moderate anaemia.
For component 1 we screened pregnant women attending antenatal clinic. and collected blood samples from those who were willing to participate in the study. Attempt was made to collect blood samples from 150 -200 women from thre groups - non ananemic women , women with mild and moderate anaemia ; however it was not possible to get sufficient number of nonanaemic women. therefore samples were collected from 152 women with >10g/dl ; 192 women with Hb between 8.0-9.9 g/dL and 166 women Hb between 5.0-7.9g /dL

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For phase -2 Component 2 Blood samples were collected from 73 pregnant women with moderate anemia before and eight weeks after 10 IM injections of each containing 150 mg iron, 1500µg folic acid, 150µg vitamin $B_{12}$ to assess the impact on the injection on indicators of iron, folic acid and vitamin B12 status .
There were no significant differences in socioeconomic and obstetrics parameters in women with varied Hb levels . Iron and folic acid deficiency were the most common deficiencies associated with anaemia in pregnancy, but not all women with mild or moderate anaemia had iron , folate or B12 deficiency. Vitamin B12 deficiency does exist but prevalence of B12 deficiency was far lower than iron and folic acid deficiencies.

Following IM therapy there was a dramatic improvement in mean values of serum iron and ferritin but there was not much change in mean values of folate and B12 . Prevalence of combined iron and folate deficiency came down from 34.2 to 6.8 % and isolated iron deficiency from 23.3 to 1.4%. There was a steep increase in isolated folate deficiency from 8.3 to 35.6% following IM therapy. There was no change in prevalence of vitamin B12 deficiency after IM therapy.

These results suggest that IM therapy resulted in differential response to the indicators of iron, folate and vitamin B12 status. This could be due to the following reasons. The improvement in iron status indicators could be due to the slow release of iron from the site of absorption and its utilisation in Hb production and store repletion. Lack response to the injected folate and vitamin B12 may be due to the faster excretion of these two water soluble vitamins. The poor folate and B12 status might have partly contributed to the suboptimal Hb response. It is well known that iron therapy unmasks latent folate deficiency in moderately anaemic women; folate deficiency might be one of the factors responsible for the relatively suboptimal response to IM therapy.

**Implications**

This study has shown that prevalence of iron and folic acid deficiency is high and prevelnce of vitamin B12 deficiency is relatively low ; it is logical that the National programme for control of anemia in pregnancy has a focus on iron and folic acid medication in appropriate doses and routes in this population. However Pune maternal nutrition study and the Bangalore study indicate that prevalence of B12 deficiency was high in their study populations. In view of this it might be important to estimate the prevalence of folate and B12 deficiency in different parts of the country. If the prevalence of vitamin B12 deficiency is high in many regions, it might be appropriate to undertake studies to find out the impact of vitamin B12 given along with the iron and folic acid to pregnant women .

Iti s intriguing that substantial proportion of anaemic women were not having iron or folate deficiency. Many of these women may have deficiencies of other micronutrients such as riboflavin and vitamin A . Data from Gambia that indicate that providing riboflavin in addition to iron folate to anaemic pregnant women in living areas where riboflavin deficiency is high, improves the Hb levels. It is important to undertake studies to explore the impact of IFA alone and iron with vitamins B complex supplementation during pregnancy on Hb and vitamin B12, folate, riboflavin and pyridoxine status. Such studies may provide useful inputs which may help to evolve appropriate guidelines for national anaemia control programme.

Inview of the findings that following 10 IM injections with iron , folic acid and B12 , there was no improvement in folic acid or vitamin B12 status, it might be appropriate to undertake studies on impact of IM iron and oral folic acid or B complex (including vitamin B12) supplementation on Hb levels and on folic acid, pyridoxine and vitamin B12 status in pregnant women.