

Assessment of Maternal Folic Acid and Vitamin B12 Supplement with Foetus Growth

Dr. Guria Kumari* and Dr. Ramanujam Singh

M. B.B.S, MS(Anatomy) India.

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ABSTRACT :

The intrauterine growth & development of foetus is most susceptible stage in the human life cycle. The pregnant woman necessities extra quantities of nearly all essential nutrients to sustenance the growth and development of the foetus. In last few years, the requirement for additional folic acid before and during pregnancy has been extensively discovered, as there is association of it with the neural tube defects. And vitamin B12 is needed for synthesis of red blood cells.

The maternal folic acid and vitamin B12 are linked with birth weight & body proportions of their newborn. Hence to get the normal weight baby delivered supplementation of folic acid and vitamin B12 is necessary. On this point the present assesment was designed to assess maternal folate & vitamin B12 status with respect to birth weight & body proportions of their newborn.

The level of the folic acid and vitamin B12 was found to be very less in the women's who had delivered the lower weight babies. This findings are similar to the reported study in the literature.

So based on the already reported study and the present study we can conclude that the folic acid & vitamin B12 are two important supplements necessary for the normal baby growth.

Keywords: folic acid, vitamin B12, maternal , foetal growth

INTRODUCTION:

The period of intrauterine growth and development is one of the most vulnerable periods in the human life cycle. The weight of the infant at birth is a powerful predictor of infant growth and survival, and is dependent on maternal health and nutrition during pregnancy. Low birth weight (LBW) is defined as weighing less than 2,500 g at birth. In developing countries, including India, the majority of LBW infants because of intrauterine growth retardation (IUGR) are born small at term (> 37 wk of gestation) with only 6.7 per cent born prematurely. Low birth weight leads to an impaired growth of the infant with its attendant risks of a higher mortality rate, increased morbidity (1) , impaired mental development (2) , and the risk of chronic adult disease (3) . Infants who weight 2,000-2,499 g at birth have a four-fold higher risk of neonatal death than those who weight 2,500-3,499 g.

To support the growth and development of the fetus, a pregnant woman requires extra amounts of nearly all essential nutrients. In fact, the recommended intake of some of the nutrients, including iron and folic acid, increases so much over nonpregnancy amounts that most physicians

encourage pregnant women to take a vitamin and mineral supplement each day to ensure nutrient needs are met.

In recent years, the need for extra folic acid before and during pregnancy has been widely publicized, as researchers continue to establish a connection between the neural tube defects and folic acid deficiency. Neural tube defects, such as spina bifida, are among the most common birth defects in the United States, with approximately 2500 new cases occurring the each year.

Additional vitamin B12 is needed for synthesis of red blood cells.

Recently, interest has turned to specific micronutrients as possible limiting factors for foetal growth. The effect of micronutrients in significantly decreasing the risk of low birth weight has also been demonstrated in randomized trials of multiple micronutrient supplementation of HIV-infected pregnant women in Tanzania (4) and more recently in pregnant mothers in Nepal (5). Data concerning the effects of maternal malnutrition on birth outcome in rural India have been reported in a prospective study

*Corresponding author:

Guria Kumari

M. B.B.S, MS(Anatomy) India.

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of 797 rural Indian mothers, where birth size was strongly associated with consumption, at week 28 of gestation, of green leafy vegetables with no association between size at birth and maternal energy and protein intake.

An earlier study reported negative correlations between birth weight and maternal vitamin B12 levels at delivery in smokers in a Western group of women (6). An association between low serum and amniotic fluid concentrations of B12 and neural tube defects has also been reported (7). It is now known that the prevalence of vitamin B12 deficiency is high in the Indian population, with metabolic evidence of deficiency in 75 per cent of young urban Indian men and women, in whom less than 5 per cent had both folate deficiency and anaemia (8).

The maternal folic acid and vitamin B12 status are proved to be associated with birth weight & body proportions of their newborn. So it could be possible to bring health benefit for our pregnant women and to get rid of low birth weight by folic acid and vitamin B12 supplementation. With this view the present study was designed to evaluate maternal folate & vitamin B12 status with respect to birth weight & body proportions of their newborn.

Methodology of Study (14):

The present study was conducted in the Hospital in the North India. A total 100 pregnant women's were included in the study. These are divided in to two groups.

Group I : Women's delivered Low weight babies.

Group II : Women's delivered Normal weight babies.

The pregnant women's suffering from the any other conditions during the pregnancy were excluded from the study. At the IIIrd trimester maternal serum & Vitamin B12 were calculated. The anthropometric parameters of the babies were also collected.

Result & Discussion:

The data of the maternal folate and the Vitamin B12 were collected and presented in the following table.

Table 1: Comparison of Vitamin B12 & Folic Acid in two groups

Group	Vitamin B12 (picogm/ml)	Folate (nanogm/ml)
Group I	176.9	6.1
Group II	221.9	11.2

Table 2 : Comparison of the anthropometric measurements

Anthropometric Parameter	Weight (kg)	Length (cm)	OFC (cm)
Group I	2.20±0.12	42.50±1.5	32.1±1.4
Group II	2.90±0.3	48.0 ±1.6	34.5±1.8

The maternal folate and the vitamin B12 concentrations were successfully calculated in the present study on both groups. We had evaluated the association of maternal folic acid and vitamin B12 relationship with the foetal birth

weight and length. The data of the folic acid and the vitamin B12 was compared in the women's who had given birth to lower weight babies and with the womens who had delivered the normal weight babies.

The level of the folic acid and vitamin B12 was found to be very less in the women's who had delivered the lower weight babies. This findings are similar to the reported study in the literature. The authors Scholl et al. , Tamura et al., Rolschau et al. (9), Rao et al., Lindblad et al. also showed the similar observations in there study (9-14).

So based on the already reported study and the present study we can conclude that the folic acid & vitamin B12 are two important supplements necessary for the normal baby growth.

Conclusion:

In summary, there appear to be several maternal nutritional variables that seem to be operating in association with low birth weight in developing country women during pregnancy. While socio-economic status is one such, and may indeed be an issue that underpins many of the other aetiological factors, it also seems that maternal weight gain is important, in addition to specific nutrients such as vitamin B12, folate and essential fatty acids. The analysis of the clustering of these risk factors in specific socio-economic or home circumstances, or in specific cultural behaviours, or in food intake patterns is of interest, as such analyses may provide the way forward for effective and sustainable prevention strategies.

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