



ROLE OF MICRO NUTRIENTS IN THE REPRODUCTIVE HEALTH OF WOMEN

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Abstract:

The achievement of a successful pregnancy represents one of the fundamental functions of existence. The nutritional status of women must be a goal preventing detrimental nutritional unbalances. In particular, diet during the first trimester may be more important to development and differentiation of various organs. Moreover, also preconceptional nutrition is crucial for an optimal onset and development of pregnancy. Unfortunately, nutritional intake of childbearing age women appears to be inadequate during the preconceptional period, mainly in terms of micronutrients. Thus, efforts to increase awareness of a healthy diet and lifestyle should be strengthened not only throughout pregnancy but also before, given that pregnancies are often unplanned. A meta-analysis evidenced the relationship between preconceptional care and reduced risk of congenital anomalies in the offspring of women with pregestational diabetes mellitus the role of preconceptional folic acid supplementation in the prevention of NTDs has been reported. There is a association between preconceptional maternal nutrition and pregnancy outcomes. Interestingly, intakes of magnesium and ascorbic acid above the RDA at 375.9- 502.9 and 97.9- 295.8 mg/day, respectively, were found to substantially decrease OFC risk. Bay considering that RDAs for pregnant women are 300-360mg/day magnesium and 90mg/day ascorbic acid, these results seem to indicate that the RDAs for these nutrients are insufficient for women of reproductive age.

Key Words: Nutrition, Micronutrients, OFC risk, Pregnancy, Abortion

Introduction:

Adequate nutrition before and during pregnancy has greater potential for a long term health. Impact than it does at any other time. Maternal health is a complex, influenced by various genetical, social and economical factors, infections and environmental conditions many of which may affect the foetal growth. A women who has been well nourished before conception, begins her pregnancy with reserves of several nutrients so that the needs of the growing fetus can be met without affecting her health. Particularly micronutrient deficiencies have been associated with significantly high reproductive risks, ranging from infertility to foetal structural defects and long term diseases. (McArdk and Ashworth 1999, Andersen et al 2006). During the past decade, micronutrient deficiencies have been attracting attention of both academicians and administrators. In India, the micronutrient deficiencies of public health significance in pregnancy are Vitamin –A deficiency, iron deficiency anemia and iodine deficiency disorders. There is evidence that indicates a role for micronutrient supplementation in preventing some pregnancy disorders. Furthermore improve the maternal intake of many nutrient directly enhances the quality of breast milk. Since pregnancy is characterized by different stages that represent a continuum the timing of nutritional insult impacts differently both on the overall outcome of pregnancy and on the nature of adult diseases by programming the post-natal path

physiology, and having the potential to affect cell numbers (Newnhametal, 2002 Harding 2006). In particular the preconceptional period is critical in determining fetal development and health. The onset of several malformations and pregnancy related disorders may indeed occurs during this period. Therefore the present study was carried out to assess the prevalence of common micronutrient deficiencies among the rural pregnant and lactating woman.

Objectives:

- 1) To assess the current status of micronutrient deficiencies among the pregnant and lactating women.
- 2) To assess the reproductive risks related to micronutrients during the preconceptional period
- 3) To determine the fetal development and health due to the potential onset of several disorders of micronutrient deficiency.
- 4) To Find out the association between reproductive risks and micronutrient deficiency.

Methodology:

A purposive sampling procedure was adopted for selecting the sample. Diet and nutrition survey method was carried out in the five village in Daryapur Taluka of Amravati District. 150 samples were interviewed by pre tested questionnaire and observation scheduled was adopted comparing of independent study variable such as socio- economic background food habits, nutrient intake, and anthropometry

and biochemical investigation and with dependent variable such as micronutrient deficiencies, reproductive risk factors, fetal development and onset of delivery, micronutrient deficiency and health problems. Association between the reproductive risk factors and micronutrient deficiency were calculated by chi-square test.

Result and Discussion:

Study was focused on pre-conceptual critical stages as potentially affected by nutrition and effects of micronutrients intake on maternal status during the different phase of the onset and development of pregnancy and conceptus. Malnutrition is a major problem and majority of Indian pregnant women belonging to rural strata are undernourished. Table I gives the sample size was computed.

Number of target individuals to be selected by using systematic purposive sampling method. Socio-economic and demographic profile of sample was given in Table 1. The proportion of agricultural was more in rural area. The overall female literacy was below the 10th Std. the average family size below eight was reported in joint family.

Nutritional status of samples:

Deficiency of micronutrient which play crucial role in host of physiological, biological and immunological functions of body has been assessed through dietary survey. The result of dietary survey was summarized in Table No.2.

Data in table no. 2 reveals that almost diets were deficient even on the basis of the lowered yardstick of adequacy (m-2SD) of mean requirement because within the households the available food is distributed according to the status of the individuals rather than according to nutritional requirement. A systematic sex bias was reflected in higher deprivation of women vis-a-vis male. Food taboos especially those pertaining to pregnant and lactating women further accentuate her already weakened nutritional status. Analysis of food habits of dietary pattern shows that the availability of vegetables and fruits is limited which exacerbate the nutritional problem among them.

Clinical Signs of Micronutrient Deficiencies:

All samples were assessed for clinical examination for VAD, IDA and IDD. The table 3 gives the percentage of investigation. The sample for assessing the prevalence of VAD was calculated assuming the prevalence of Bitot spots. Estimation of Hemoglobin level was calculated assuming the prevalence of IDA &

IDD prevalence was calculated assuming a goiter prevalence of 10%

Table 3 indicated that the average of low serum vitamin A levels (<20g/dl) among sample was about 40%. The overall prevalence fBitot spot was about 70%. The overall prevalence of total goiter among samples was about 40%. In general they were using un-iodised salt. The mean hemoglobin levels among pregnant women registering the lowest values 7.9 to 9.2 g/dl) and lactating women in between 9 to 10.6 g/dl). More than three fourth (84.3%)of pregnant women were anemic (<11 g/dl) while 4 % had severe anemia. The overall prevalence of anemia among lactating women < 12 g/dl was about 78% while 3 % had severe anemia.

Preconceptional Nutritional and Maternal health:

The effect of under nutrition during reproduction will vary depending upon the nutrients involved the length of time it is lacking and stages of gestation at which it occurs. There are so many factors which influences the reproductive process. The diet and nutrition are variable which are readily controllable by the women evidence indicate that by consuming the appropriate amount of energy and nutrient increase the probability of normal development of the fetus, an uneventful parturition and the long term health of both mother and child. Skipping the breakfast and snacks by rural women, their diet are nutritionally unbalanced and intake of micronutrients in general fails to meet recommended daily allowances. There is also sound evidence that adequate intake of micronutrients can prevent many serious birth defects, reduce the risk of premature and low birth infants and support maternal health.

Micronutrient seems to affect pregnancy outcomes through alternations in maternal and fetal metabolism due to their involvement in enzyme. Their main functions are given in the flow diagram.

Effect of micronutrient deficiency on pregnancy outcomes:

Evidence on the preconception involvement of micronutrients upon pregnancy outcomes is given in **Table – 4**.

Preconceptional folic acid supplementation is a goal of public health to prevent NTDS.a low iron status was adversely affects important regulators of growth and development.A relationship was observed between low ferritin <12 μ g /1 and reduced birth weight acute or chronic inflammation and increased risk of LBW & fetal growth restriction it was reported that prophylactic iron

supplementation given from about 12 weeks of gestation to the third trimester among income women, then, the birth weight was significantly higher. Maternal vitamin –B status was observed to influence reproductive events from the start of pregnancy firstly through the indvement of vitamin- B dependent co-enzyme in the metabolism of amino acid, lipids, nucleic acid and glycogen. Significantly lower vitamin- C blood levels in women with premature rupture of the amnionic membranes and abruption placentae.

Figure 1 - main function of micronutrient in pregnancy outcome

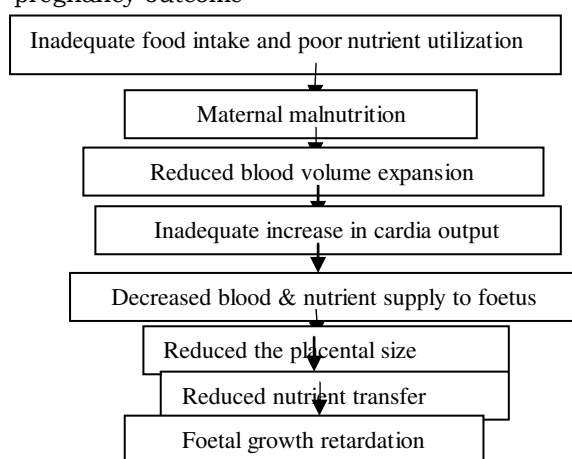


Table 1: sample size computed according to family background.

Sr. No.	Characteristics	Simple size	
		Pregnant	Lactating
1.	Age Below 20 yrs. Above 20 yrs.	23	12
		57	58
2.	Education Below 10 th Std. Above 10 th Std.	69	52
		18	11
3.	Type of Family Nuclear Joint	14	10
		72	59
4.	Occupational status Agricultural Other	54	38
		27	31

Table 2: Assessment of Nutritional status

Sr. No	Characteristics in terms nutrients/day	R.D.A	Actual Intake
1.	Calories (Kcal)	2750	2000
2.	Protein (gram)	65	40
3.	Calcium (mg)	1000	600
4.	Iron (mg)	38	18
5.	Vitamin, A,(β) carotene (mg)	2400	2000
6.	vitamin C, (mg)	40	25
7.	B- Complex (mg)	1.4-1.7	1.2
8.	Folic acid (μg)	400	200
9.	Vitamin- B 12 (μg)	1.0	0.4

Table 3: Sample size computed for clinical examination

Stages disorders	Investigation	Finding sample size%
Pregnant/ lactating VAD	a)Clinical examination	70
	b)Serum Vitamin A	49
Pregnant/ lactating IDA	a)Clinical examination	84.03
	b) Estimation of hemoglobin	78.0
Pregnant /lactating IDD	a) Clinical examination	40.0
	b) Spot test	31.9

Table- 4: micronutrient deficiency and pregnancy outcomes:

Sr. No	Micronutrient	Outcome	Effect
1	Preconceptional intake of several vitamin and minerals	Spina bifida	2-5 fold increased risk of spina bifida
2	Preconceptional intake of and supplement of dietary zinc	NTDS	Risk of NTDS in infants & fetus
3	Dietary intake of riboflavin & nicotinamide	OTD	Increased more than to fold the risk of child with an OTD
4	Dietary intake of B- vitamin	CHD	increased risk of child with CHD
5	Preconception B- vitamin status	Preterm and low birth weight	Risk of preterm birth was 60% lover

Conclusion:-

Maternal nutrition plays a role in certain types of fetal malformation or spontaneous abortion. Due to undernourishment of the mother the baby is at an increased risk of being premature with low birth weight and developmental irregularities intra uterine nutrition is highly important for the growth of the central nervous system and kidney of the fetus which mature during the latter part of pregnancy. It is clear that there is a strong relation between importance of micronutrients before conception and the successful onset as well as healthy development of pregnancy.

References:

- 1) ADA reports of the American Dietetic Association nutrition and lifestyle for a healthy pregnancy outcome. *J Am Diet Assoc.* 2002; 102: 1479-1490
- 2) Agarwal A. Gupta S. Sharma RK. Role of oxidative stress in female reproduction. *Report BiolEndocrinol* 2005; 3:28. Doi: 10.1186/1477-7827-3-28.
- 3) Agarwal A. Gupta S, Sekhon L, Shan R. Redox considerations in female reproductive function and assisted reproduction: from molecular mechanisms to health implications. *Antioxid Redox Signal* 2008; 10:1375-1403 Allen LH Biological mechanisms that might underlie iron's effects on fetal growth and preterm birth. *Nutr* 2001; 131: 5815-589S.
- 4) Ashworth CJ, Antipatis C. Micronutrient programming of development throughout gestation. *Reproduction* 2001; 122:527-535.
- 5) Bendich A. Micronutrients in women's health and immune function *Nutrition* 2001; 17: 858-867.
- 6) Cross JC, Mickelson L. Nutritional influences on implantation and placental development. *Nutr. Rev* 2006; 64:S12 –S18. doi: 10.1301 /nr. may