



Role of Maternal Nutrition and adherence to RDA on pregnancy outcomes

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Introduction

Pregnancy is a critical time of human development, and anything that comprises the foetal environment may have important and lasting effects on the child's future health. It is important as a society to prioritize helping women understand the impact that their lifestyle and dietary choices have on their children. Maximizing the health of the pregnant mother will ensure her child the best start at life possible. Nutrition is a vital component of foetal development. Limiting exposure to damaging substances such as nicotine, caffeine, food-borne bacteria and alcohol will aid in the child's development. Helping women deal with unpleasant side effects of pregnancy as well as more serious ones should be a focus of prenatal support. Encouraging healthy lifestyle practices such as moderate physical activity and healthy dietary practices adhering to the recommended dietary allowances will create an impact not only on the child's long-term health, but potentially the mother's as well.

The role of maternal nutrition

Nutrition deserves special attention during pregnancy and breastfeeding because of the high nutrient needs and the critical role of appropriate nutrition for the foetus and infant. Physiological adaptations during pregnancy partly shield the foetus from inadequacies in the maternal diet, but even so these inadequacies can have consequences for both the short-and long-term health and development of the foetus and infant. The emphasis on achieving and maintaining a nutritionally adequate diet is important, and a poor maternal diet should be improved during pregnancy and breastfeeding to maintain the mother's health.

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It is a universally acknowledged medical truth that adequate nutrition before and during pregnancy has greater potential for a long term health of both mother and the child and it is important during the course of pregnancy. Nutrition plays a major role in maternal and child health. Poor maternal nutritional status has been related to adverse birth outcomes; however, the association between maternal nutrition and birth outcome is complex and is influenced by many biologic, socioeconomic, and demographic factors, which vary widely in different populations. The crucial recommendation to such pregnant women in India is to consume a balanced diet as described by the Indian Council of Medical Research (ICMR) which includes extra nutrients for pregnancy, lactation and childhood.

Foetal growth depends on the uptake of nutrients, which occurs at the end of a complex materno-foetal supply line. This includes intake, i.e., the mother's appetite, diet and absorption. The nutrients arriving at the placenta, and how they are transferred to the foetus, depend on maternal metabolism: her endocrine status, her partitioning of nutrients between storage, utilization or circulation, and her cardiovascular adaptations to pregnancy, such as plasma volume expansion which increases uterine blood flow. These are influenced by maternal nutrition in ways that are poorly understood. The link between maternal and foetal nutrition is thus indirect and explains why the full impact of maternal diet on foetal growth remains unclear.

Relation between maternal nutrition and birth outcomes

Poor fetal growth has been attributed to widespread maternal under-nutrition. Maternal nutrition is an important factor responsible not only for health of baby, but also for the baby's long term growth. Therefore understanding maternal nutrition and foetal growth relationship is critical.

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. Poor maternal nutrition has however been shown to be one of the major causal determinants of IUGR in both developed and developing countries. The most sensitive measure of acute nutritional stresses during pregnancy is indeed maternal weight gain. There is strong epidemiological evidence of an association between maternal weight gain during

pregnancy and LBW/IUGR, especially in undernourished women i.e. those who begin pregnancy in a nutritionally disadvantaged state. Women are at the greatest risk of having a LBW infant if low pre-pregnancy weight and low weight gain during pregnancy are combined. Maternal nutrition has therefore been the focus of considerable research over the last few years.

Any abnormality in the intra-uterine environment can be detrimental to fetal growth. Failure to supply the adequate amount of nutrients to meet fetal demand, for example due to maternal malnutrition, inadequate placental function or increased nutritional demand, leads to fetal undernourishment. Increased supply of nutrients to the fetus is also detrimental. Fetal overgrowth (macrosomia) can occur due to increased placental transport of glucose and other nutrients from a mother suffering from diabetes. Understanding the relation between maternal nutrition and birth outcomes may provide a basis for developing nutritional interventions that will improve birth outcomes and long-term quality of life and reduce mortality, morbidity, and health-care costs.

Nutrient requirement during pregnancy

Pregnancy is a demanding physiological state. In India, it is observed that diets of women from the low socioeconomic groups are essentially similar during pre-pregnant, pregnant and lactating periods. Consequently, there is widespread maternal malnutrition leading to high prevalence of low birth weight infants and very high maternal mortality. Additional foods are required to improve pregnancy weight gain and birth weight of infants, Pre-pregnant BMI, maternal age and rate of pregnancy weight gain must be considered in tailoring the calorie recommendation to the pregnant women. The daily diet of a woman should contain an additional 350 calories, 0.5 g of protein during first trimester and 6.9 g during second trimester and 22.7 g during third trimester of pregnancy. Some micronutrients are specially required in extra amounts during these physiological periods. Folic acid, taken throughout the pregnancy, reduces the risk of congenital malformations and increases the birth weight. The mother, as well as, the growing foetus needs iron to meet the high demands of erythropoiesis (Red Blood Cell formation). Calcium is essential, both during pregnancy and lactation, for proper formation of bones and teeth of the offspring, for secretion of breast-milk rich in calcium and to prevent osteoporosis in the mother. Similarly, iodine intake ensures proper mental health of the growing foetus and infant. Vitamin A is required during lactation to improve child survival. Besides these, nutrients like vitamins B and C need to be taken by the lactating mother.

Recommended dietary allowances during pregnancy

The pregnant/lactating woman should eat a wide variety of foods to make sure that her own nutritional needs as well as those of her growing foetus are met. There is no particular need to modify the usual dietary pattern. However, the quantity and frequency of usage of the different foods should be increased. She can derive maximum amount of energy (about 60%) from rice, wheat and millets. Cooking oil is a concentrated source of both energy and polyunsaturated fatty acids. Good quality protein is derived from milk, fish, meat, poultry and eggs. However, a proper combination of cereals, pulses and nuts also provides adequate proteins. Mineral and vitamin requirements are met by consuming a variety of seasonal vegetables particularly green leafy vegetables, milk and fresh fruits. Bioavailability of iron can be improved by using fermented and sprouted grams and foods rich in vitamin C such as citrus fruits. Milk is the best source of biologically available calcium. Though it is possible to meet the requirements for most of the nutrients through a balanced diet, pregnant/lactating women are advised to take daily supplements of iron, folic acid, vitamin B and calcium.





Additional dietary care

Adequate intake of a nutritious diet is reflected in optimal weight gain during pregnancy (10 kg) by the expectant woman. She should choose foods rich in fibre (around 25 g/1000 kcal) like whole grain cereals, pulses and vegetables, to avoid constipation. She should take plenty of fluids including 8-12 glasses of water per day. Salt intake should not be restricted even to prevent pregnancy-induced hypertension and pre-eclampsia. Excess intake of beverages containing caffeine like coffee and tea adversely affect foetal growth and, hence, should be avoided. In addition to satisfying these dietary requisites, a pregnant woman should undergo periodic health check-up for weight gain, blood pressure, anemia and receive tetanus toxoid immunization. She requires enough physical exercise with adequate rest for 2-3 hrs during the day. Pregnant and lactating women should not indiscriminately take any drugs without medical advice, as some of them could be harmful to the foetus/baby. Smoking and tobacco chewing and consumption of alcohol should be avoided. Wrong food beliefs and taboos should be discouraged.

While under nutrition continues to be major problem as in the earlier decades, the current decade has witnessed the progressive rise of over nutrition in women during reproductive age especially among the affluent segments of population both in urban and in rural areas. It has become imperative to assess the nutritional status of

pregnant women and give them appropriate advice and care.

Related Resource

1. [My Safe motherhood](#) 
2. [WHO recommendations on nutrition during pregnancy](#) 
3. [Dietary guidelines for Indians - A manual](#) 
4. [National Guidelines for Calcium Supplementation During Pregnancy and Lactation](#) 

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