



The Negative Impact of Vitamin D and Other Micronutrient Deficiencies in Pregnant Women

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Received 28th Oct 2021,
Accepted 27th Nov 2021,
Online 14th Dec 2021

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Annotation: In recent years, there is increasing evidence that high body mass index in women before pregnancy, as well as high weight gain and malnutrition during pregnancy, are significant factors contributing to an increase in noncommunicable diseases and may negatively affect the duration and outcome of pregnancy. Children born with too little or too much weight are prone to intrauterine programming, with a correspondingly high risk of developing metabolic diseases during life.

Key words: vitamin D deficiency, pregnancy, folic acid.

Relevance: B vitamins play an important role in the regulation of energy metabolism, help to reduce insulin resistance and are essential for human growth, including nervous system and brain development. Deficiency of folic acid (folate) causes anaemia, and folate deficiency is associated with neural tube defects (NTDs), limited prenatal fetal development and other fetal malformations, preterm birth and low birth weight. DNTs are among the most common inherited fetal anomalies.

Studies have shown that taking folic acid supplements before conception can prevent up to 46% of cases of DNT. A comparison of children born to normal-weight women and those born to obese women shows that the latter are at higher risk of DNT. In addition, children born to obese women from low socioeconomic backgrounds also have an increased risk of DNT and are more likely to be off their folic acid supplementation. Folate deficiency has also been shown to be a risk factor for cardiovascular disease. Folate, like other B vitamins, is involved in homocysteine metabolism. Evidence suggests that homocysteine may contribute to atherosclerosis by affecting the inner wall of arteries and triggering the formation of blood clots.

Homocysteine levels are influenced by genes as well as by the folate, vitamin B6 and vitamin B12 received with food. In addition, low folate levels are associated with an increased risk of fatal coronary heart disease and heart attack during life. Iron deficiency in pregnant women is the most common deficiency of all other minerals, and the most common type of anaemia is iron deficiency anaemia. In the first trimester of pregnancy, vitamin and micronutrient deficiencies can lead to fetal malformations, intrauterine disorders and fetal death. In this perinatal period, the formation of organs, certain groups of cells and tissues, cell differentiation occurs, the fetus is particularly vulnerable and dependent on a full supply of iodine, folic acid and many essential micronutrients. Vitamin deficiencies in the second and third trimesters of pregnancy do not cause obvious abnormalities in

foetal development, but often lead to organ formation disorders and cause problems in the cardiovascular, nervous, endocrine and digestive systems of the child.

According to the recommendations of the Ministry of Health and Social Development, vitamin therapy is administered for

- periconceptional prophylaxis;
- normal course of pregnancy;
- Premature termination of pregnancy;
- gestosis;
- Cardiovascular diseases in pregnant women;
- Inflammatory kidney disease in pregnant women;
- physiological postpartum period.

Obese pregnant women have a higher risk of vitamin D deficiency compared with normal-weight women. Obesity reduces the bioavailability of vitamin D. Adipose tissue has been shown to have its own vitamin D requirement (a fat-soluble vitamin), and during pregnancy vitamin D is taken from maternal stores. It has also been found that the higher the maternal adipose tissue supply, the higher the need for vitamin D. During pregnancy, women are often advised to take vitamin D in the form of preparations, especially if they live in the northern hemisphere. Adequate maternal vitamin D levels are necessary for the development of the musculoskeletal system, the brain and the immune system of the foetus. Lack or deficiency of vitamin D can negatively affect the child's bone growth and lead to a long-term bone health disorder such as osteoporosis, regardless of the child's postnatal nutritional status. In addition, vitamin D deficiency increases other risks: fetal growth retardation, low birth weight, and risk of neonatal tetany, hypokalemia, cardiovascular disease, type I diabetes and cancer in later life. For the mother, vitamin D deficiency is associated with an increased risk of pre-eclampsia, preterm birth, insulin resistance, gestational diabetes, immune system dysfunction and bacterial vaginosis.

Conclusions: Women planning pregnancy should start taking vitamins before pregnancy to achieve stable levels at the right time, and continue the course until at least 12 full weeks of pregnancy, to eliminate some adverse factors.

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