Disease and Diagnosis

Dis Diagn. 2023; 12(1):55-56

doi 10.34172/ddj.2023.428

Letter to Editor

The Role of Vitamins Deficiency in the Development of Hydatidiform Moles: Mechanism and Function

Mojdeh Banaei[1], Sepideh Rezaei Ghamsari[2], Nasibeh Roozbeh[1*]

[1]Mother and Child Welfare Research Center, Hormozgan University of Medical Sciences, Bandar Abbas, Iran.
[2]Department of Midwifery and Reproductive Health, Tehran University of Medical Sciences, Tehran, Iran.

***Correspondence to** Nasibeh Roozbeh, Email:nasibe62@yahoo.com

Received: June 23, 2022, Accepted: July 26, 2022, ePublished: December 2, 2022

Dear Editor,

Hydatidiform mole is characterized by the swelling of the placental villi, trophoblastic hyperplasia, and the absence or abnormal presence of an embryonic element which is one of the emergency conditions in pregnancy that can endanger the lives of women (1). Its prevalence varies by geographical region, and the incidence is higher in Asia, the Middle East, and Africa (2). Studies have shown that nutritional deficiencies such as reduced dietary intake of animal fats and carotene, which are precursors to vitamin A production, can also increase the risk of molar pregnancy, and women who consumed more carotene-containing foods were 40% less likely to have a molar pregnancy (3). In the human body, vitamin A or its precursor is metabolized to retinol, and in the next step, retinol is metabolized to retinoic within the cells. Finally, the retinoic complex and the retinoic receptor led to apoptosis and terminated the cell cycle (4). Increased apoptosis can reduce the risk of malignant trophoblastic disease, thus activating and inducing apoptosis and ending the cell cycle with retinoic acid may be effective as a treatment to prevent malignant trophoblastic disease. In fact, low levels of retinol in the liver and blood of patients with hydatidiform mole reduce retinoic acid in the cell and lead to the uncontrolled proliferation of trophoblastic cells and reduced apoptosis, increasing the risk of hydatidiform conversion (5).

According to some studies, the serum levels of vitamin D are significantly lower in women with gestational tumor neoplasia and hydatidiform mole (6). Vitamin D is an anti-cancer agent and has a regulatory role in the innate immune system and on natural killer cells, cytotoxic T cells, and macrophages. The JEG-3 cell line, which is the human choriocarcinoma cell, produced less vitamin D (calcitriol) than normal human syncytiotrophoblast cells; the other effects of vitamin D on cells (e.g., vitamin A) induce differentiation and cell apoptosis (7). Vitamin D is also thought to play an important role in the etiology and treatment of cancers (8). Therefore, presumably vitamin D deficiency in women with a molar pregnancy can lead to the development of the trophoblastic neoplasms of pregnancy.

Moreover, folate and B12 are essential for protein and DNA synthesis (9). The concentration of the concentration of the vascular endothelial growth factor (VEGF) in molar pregnancies was higher than in normal pregnancies. In fact, there may be an association between molar pregnancy, angiogenesis markers (e.g., VEGF), and endothelial damage or dysfunction. Vitamin B12 and folate may also be involved in the pathogenesis of molar pregnancy before the new vascular stage (7). According to the literature review, vitamins E and C, which have plasma antioxidant properties, were significantly lower in women with a molar pregnancy, while the oxidative stress index was significantly higher. Therefore, antioxidant supplements such as vitamins E and C are recommended for treating and preventing the recurrence of molar pregnancy (8). Various studies have focused on the hypothetical mechanisms of oxidative stress in hydatidiform mole, including preeclampsia. In both diseases, the placenta is the main source of factors that lead to similar metabolic changes (9). Furthermore, the main factor in the pathogenesis of molar pregnancy such as preeclampsia is an increase in oxidative stress factors (8). However, further studies are needed to explain the exact mechanisms of oxidative stress in patients with complete hydatidiform mole.

Therefore, it is clear that molar pregnancy management, including prevention, early diagnosis, and follow-up, is highly important for saving the mother's life. Thus, considering the complications of molar pregnancy and the importance of preventing its recurrence, it is possible

to design clinical trials and prescribe vitamin supplements for preventing the recurrence of hydatidiform mole in women with a history of molar pregnancy by examining and determining nutritional and vitamin deficiencies in women with a history of molar pregnancy.

Author Contributions

MB and NR created main idea and were responsible of the article writing. SRGH was responsible for evaluation of articles . All authors approved the final manuscript.

Conflict of Interests

There are no conflicts of interests.

Ethical Approval

Not applicable.

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