

“The impact of selenium and iodine status on pregnancy outcome and newborn’s condition in patients with Hashimoto’s thyroiditis.”

Hashimoto thyroiditis (HT) is a representative of the spectrum of autoimmune diseases and is the most common problem in endocrinological practice, affecting nearly 15% of population, mainly women. In this condition human body produce antibodies against thyroid gland, causing destruction and gradual loss of its function. The reason why this process evolve in particular person is not yet well-understood. Consequently, there is still no causative treatment, but lifelong supplementation with lacking thyroid hormones.

In recent years, there is increased interest in microelements’ influence on thyroid homeostasis, especially selenium and iodine. Iodine is a vital microelement to build thyroid hormones. Selenium, acting as a part of protein enzymes (e.g. glutathione peroxidase), has antioxidative properties, essential by excessive free radicals releasing during thyroid hormone production and therefore protects cells from damages, which could potentially trigger autoimmune organism response. Additionally, as a part of other protein (iodothyronine deiodinases) is responsible for the last stage of thyroid hormones synthesis, converting tetraiodothyronine (T4) to the active form- triiodothyronine (T3).

Despite of implementation of obligatory salt iodization in 1997, according to the latest World Health Organization (WHO) report (2007), Poland is still mild iodine deficient country. In comparison to other parts of the world, Europe is considered as a moderate selenium equipped region. One of the lowest selenium intake was noted in Poland with dramatically low selenium level among pregnant women. A few clinical trials have already proven, that selenium supplementation reduced antithyroid antibodies level, therefore alleviated thyroid autoimmunization process. Interestingly, so far, there is no official recommendation concerning selenium supplementation in the course of HT, however, selenium specimens are already widely prescribe in this group of patients.

Taking all above into consideration we decided to verify hypothesis, whether inadequate selenium supply in our region of Greater Poland, together with mild iodine-deficiency have a negative impact on children thyroid functioning from the origin of life and their fetal development. We focus on the most beneficent for selenium supplementation and at the same time most at risk of negative consequences of selenium depletion group of pregnant females with HT.

The aim of the study is to assess serum selenium, urine iodine concentrations and thyroid indices in mothers before delivery and compare them to the selenium and thyroid status measured in neonatal cord blood after delivery. The results are going to be related to the routine newborn’s birth parameters and their general health condition. Beside study group containing HT patients, we will include similar number of healthy pregnant women and their newborns. Additionally, we will perform paper surveys among mothers concerning their pregnancy course, health conditions, lifestyle, medication and supplements intake to provide homogeneity of the group and avoid biases. To increase feasibility of the project and reliability of measurements, we will cooperate with Institute of Experimental Endocrinology of Charité Medical University in Berlin, which area of interest is the role of microelements in thyroid functioning.

The results of proposed project may contribute to the better understanding of the etiology and pathogenesis of HT. We intend to investigate this area, because of increased incidence of HT, still not well-defined risk factors for the disease development and appearing scientific evidences for advantageous of external selenium intake on maintaining thyroid homeostasis. If lacking microelements supply appear to be one of relevant triggers to evoke evolution of thyroid autoimmunity and following appropriate interventional methods may be implied, theoretically, we may manage to stop or delay thyroid dysfunction development and therefore decrease the incidence rate and the need for lifelong thyroid hormones supplementation.

We also believe that our basic and observational study will be encouraging to perform more randomized clinical trials on selenium supplementation, on a large cohort of pregnant women and in the future proper guidelines for that issue will be formulated. In our opinion, in times of increasing awareness of patients about the necessity to take variety of diet supplements, supported by pharmaceutical concerns and on the other hand, inconclusive results of performed so far clinical studies as well as conflicting endocrinologists opinions, there is a need to deeply investigate the topic and provide new evidence-based medicine arguments to the current worldwide discussion. Relevant is establishment of early diagnosis of thyroid gland dysfunction in pregnant woman and rapid response in order to limit the negative influence of microelement’s deficiencies for physical and psychological development of child.