

## STUDY REGARDING THYROID DISEASES DISTRIBUTION IN BIHOR COUNTY

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### **Abstract**

*Iodine is an important mineral for the well being of the human body. Iodine deficiency is correlated with thyroid function abnormalities, goiter, mental retardation, decreased fertility rate, increased perinatal death, and infant mortality. To prevent all these, the law imposes salt iodization. Even so, Bihor County is an endemic area for iodine deficiency disorders, especially in the North-East (33% of cases) and along the sub montane areas (25.92% of cases). To determine the cause for these situation, controls have been made, samples have been analyzed and 25% of them had lower quantity of iodine than necessary.*

**Keywords:** iodine deficiency, iodized salt, thyroid

### **INTRODUCTION**

Iodine is a trace mineral whose total amount in the body is 15-20 mg in adults. Its key role is as substrate for synthesis of thyroid hormones. Knowledge of the distribution of iodine in nature is important for understanding endocrine thyroid pathology. (Zbranca E., 2007). UNICEF and WHO recommend that the daily intake of iodine should be as follows:

- 90 µg for preschool children (0 to 59 months);
- 120 µg for schoolchildren (6 to 12 years);
- 150 µg for adolescents (above 12 years) and adults;
- 250 µg for pregnant and lactating women.

When the physiological requirements of iodine are not met in a given population, a series of functional and developmental abnormalities occur including thyroid function abnormalities and, when iodine deficiency is severe, endemic goiter and cretinism, endemic mental retardation, decreased fertility rate, increased perinatal death, and infant mortality (Delange F., 1994).

Iodine deficiency, through its effects on the developing brain, has condemned millions of people to a life of few prospects and continued underdevelopment. On a worldwide basis, iodine deficiency is the single most important preventable cause of brain damage. People living in

areas affected by severe iodine deficiency may have an intelligence level of up to 13.5 points below that of those from comparable communities in areas where there is no iodine deficiency (Bleichrodt N, Born M.A., 1994). This mental deficiency has an immediate effect on child learning capacity, women's health, the quality of life in communities, and economic productivity.

Recognizing the importance of preventing iodine deficiency disorders, the World Health Assembly adopted in 1991 the goal of eliminating iodine deficiency as a public health problem. (WHO, 2007).

To identify iodine deficiency disorders there are needed a few laboratory investigations. Based on the activity report of the Romanian Ministry of Health, in 2013 it appears that the number of patients with thyroid dysfunction that were investigated (12672 patients) and average costs (231.11 RON) are double compared to the WHO foresight no. 422/2013.

On the other hand, iodine deficiency is among the easiest and least expensive of all nutrient disorders to prevent. The addition of a small, constant amount of iodine to the salt that people consume daily is all that is needed. The elimination of iodine deficiency is a critical development issue, and should be given the highest priority by governments and international agencies. (WHO, 2007).

## **MATERIAL AND METHODS**

This study was conducted using different data bases: WHO, Romanian Ministry of Health, Bihor County Public Health Department. A number of 27 patients were investigated; they were registered at the Municipal Hospital Oradea, suffering from endocrinopathy: goiter or hypothyroidism. Statistical analysis was used to identify where endocrine pathologies are more frequent in Bihor County, and if those areas are poor in iodine.

## **RESULTS**

Prevention of iodine deficiency is most efficiently achieved by programs of salt iodization. In 2002, the Romanian Government decided the universal iodization of salt (Governmental Decision no. 586/2002). According to this legal normative in Romania in human nutrition is used only iodized salt; for animals and food industry the use of iodized salt is optional except manufacture of bread and bakery products; the quality and security salt used as support in order to obtain iodized salt must comply with SR 13 360/1996; the NaCl content of the salt used for iodination must not be less than 97%; iodized salt must contain 30 mg iodine / kg salt or

potassium iodate 50.6 mg / kg salt or potassium iodide 39.2 / kg of salt. It is accepted as a minimum limit the iodine content of 25 mg / kg of salt, potassium iodate or 42 mg / kg salt or potassium iodide 32.5 mg / kg of salt , and the maximum content of 40 mg iodine / kg salt that 67.2 mg of potassium iodate / kg of salt, 52 mg of potassium iodide / kg of salt.

Even so, Bihor County is considered an endemic area for iodine deficiency disorders. Out of 27 patients examined in the first 3 months of 2015, at the Endocrinology Department from the Municipal Hospital Oradea, 20 of them (74.04%) suffered of goiter and 14 of them (51.85%) suffered of hypothyroidism. Regarding their areas of origins, only 10 patients were from urban places. 33% of patients are living around Marghita city, in the N-E region of the county. 25.92% of patients are living along the sub montane area of Bihor County (Fig. 1).



*Fig. 1. Distribution of patients in Bihor County*

To prevent thyroid dysfunction determined by iodine deficiency, there are national programs for monitoring the level of iodine from salt.

According to the Public Health Department, in Bihor County, in 2014, 40 samples of salt were collected from public alimentation units, as follows:

- Retail units (super / hypermarkets, food shops)
- Wholesale units (deposits).

After analyzing the samples and interpretation of the results, the following were found: presence of iodine concentrations below the limit

imposed by legislation in 10 samples of indigenous salt (25 % under iodate sample), exceeding the maximum permitted concentration of iodine was not registered.

Compared with 2013, the percentage of inadequate samples identified decreased by 7.86%, as shown in the table 1.

*Table 1.*

Evaluation of inadequate iodization of salt			
Year	Inadequate (%)	Sub iodate	Over iodate
2013	32.86%	23 samples	0 samples
2014	25%	10 samples	0 samples

Source: [www.dspbihor.ro](http://www.dspbihor.ro)

Monitoring the level of iodine in salt during 2014 was associated with supervising sanitary conditions of food establishments and with actions taken to inform the population about the need to ensure appropriate daily intake of iodine in the diet.

## CONCLUSIONS

- Iodine deficiency has negative effects on human's health.
- Thyroid disorders determined by iodine deficiency are frequent in Bihor County, being considered an endemic area.
- Most common thyroid disorders associated with iodine deficiency are goiter and hypothyroidism. In Bihor County, these pathologies are more often in the area around Marghita city and in the sub montane areas of the county.
- Prevention of iodine deficiency disorders is made by iodizing salt.
- Even if this measure is protected by law, 25% of the salt samples controlled in 2014 in Bihor County, had insufficient quantity of salt.

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