

## **Introduction**

Thyroid disease connected with the iodine deficiency are global health and social problem. The map data indicates that iodine deficiency, from slight to moderate, is on the whole territory of Ukraine. Hypothyroidism – one of the common pathologies of the endocrine system, caused by a deficiency of thyroid hormones or by reducing their biological effect at the tissue level. As at 01.01.2014 in Ukraine registered more than 103 thousand patients with the hypothyroidism.

The problem of iodine deficiency and the increasing incidence of hypothyroidism in the Poltava region and in Ukraine in general is very relevant, which requires the detection of features of the development, the clinical course of this pathology, determination of the treatment regimens and prevention depending on regional characteristics.

**Objective** – analysis of the incidence and prevalence of hypothyroidism in Ukraine and Poltava region in conditions of iodine deficiency.

## **Materials and Methods**

Comparative characteristics of thyroid pathology in Ukraine and in the Poltava region for the past 30 years, analyzed the prevalence of hypothyroidism for 2005-2013 years for building a predictive model of prevalence of hypothyroidism in Poltava region and in Ukraine in general.

## **Results**

Poltava region belongs to the zone of moderate iodine deficiency. An increased level of fluoride in Buchach aquifer, which provides water to 42.3% of districts, increases the iodine deficiency. Fluorine, as the more active halogen, entering inside the tissue of the thyroid gland, inhibit thyroid peroxidase and iodine organification in the thyroid gland, that resulting in decreased synthesis of thyroid hormones.

For the past 30 years increased not only the amount of thyroid disease in general, but has changed its structure. So, only since 1989 were regularly recorded diseases such as nodular goiter, thyroiditis, thyroid cancer, and the proportion of hypothyroidism in Poltava region grew by 4.9 times, while in Ukraine – 5.3.

We analyzed the prevalence of hypothyroidism in the Poltava region and in Ukraine in general for 2005-2013 years. It is revealed that the trend of growth of this disease continues over the years among the population of Ukraine and Poltava region.

Considering these indicators, we decided to build a prediction model for the prevalence of hypothyroidism among the population of Poltava region and Ukraine over the next 5 years. Through the use of correlation and regression analysis we have received the mathematical model. It tells about the polynomial growth in the number of patients in the Poltava region. In Ukraine schedule of the increasing in the prevalence of hypothyroidism is linear. The obtained

coefficient of determination ( $R^2$ ) indicates that in both cases the input data match a given regression and indicates a high level of adequacy of the estimated model statistics.

### **Conclusion**

1. Gradually increased not only the amount of thyroid disease in general, but has changed its structure (main part plays an improvement of diagnostics of this pathology). For the past 30 years, the proportion of hypothyroidism in Poltava region grew by 4.9 times, while in Ukraine – 5.3.
2. Analysis of the obtained data allows to conclude that the ecological state of Poltava region can be attributed to iodine deficiency. Inducer of thyroid disease, particularly hypothyroidism, is iodine deficiency, both direct and relative, in the development of what plays an important role of anthropogenic pollution (fluoride compounds, radionuclides, etc.). That means iodine deficiency is regional differences that are related to the environmental conditions of this or other region.
3. Analyzing the predictive model of the prevalence of hypothyroidism in the Poltava region we got that with a probability of 95.6% ( $R^2 = 0.9555$ ) this pathology may grow from 2013 to 2019 is almost double and will fluctuate (interval forecast) ranging from 5220 to 5853, and in Ukraine this figure will fluctuate (interval forecast) in the range from 111471,6 to 136034,6 with a probability of 90.1% ( $R^2 = 0.9097$ ). On this basis, the development of new methods of treatment, implementation of programmes for the prevention of iodine deficiency should be carried out taking into account the ecological conditions of the region concerned.