

the age of 75 years old there is a lower incidence of that cancer which may be caused by the difficulty in diagnostics at this age and higher probability of death.

Minimum incidence values are recorded in Minsk (3 per 100,000 people) and in Vitebsk region (3.7 per 100,000 people), the maximum values are in Minsk (4.9 per 100,000 people), Mogilev (4.8 per 100,000 people) Brest (5.0 per 100,000 people) regions.

In recent years, there is a positive tendency in increasing in LC diagnostics at early stages of its development.

The study of various issues related to risk factors of laryngeal cancer will improve the prevention programs and the impact on the level of this pathology.

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MOLECULAR AND BIOLOGICAL BREAST CANCER

The steady growth of malignant diseases can be associated with the worsening of ecological situation in RB. Breast cancer is the most widespread oncological disease of women. This disease affects from 1:13 to 1:9 women aged from 13 up to 90 years old during the life and is a serious problem of health care around the world. About 1 million new cases are identified annually throughout the world.

Due to the progress in the sphere of molecular and genetic research, there is the increasing recognition of the comprehension of heterogeneity and pathogenetic variety of breast cancer (BC).

In diagnostics and therapeutic approach to BC, the receptors of estrogen and progesterone are of the most importance. They represent specifically binding proteins which selectively influence a cell. At the same time, the lack of an expression of progesterone receptors is predicted to be an adverse factor for patients with BC. It is important to mention that co-expression with estrogen receptors is the characteristics of progesterone receptors. The presence of estrogen receptors in tumors is linked with a better prognosis in comparison with tumors which don't have these receptors.

The important diagnostic and prognostic factor is genotype.

Epidermal growth factor receptor of type 2 (HER2) is a transmembrane protein playing a key role in transferring the signals of growth factors. Hyperexpression of HER2/neu is an adverse prognosis for the course of a disease at BC associated with the prevalence of the neoplastic process.

Ki-67 is a nuclear anti-gene expressing in a proliferative phase of a cellular cycle. When Ki-67 is less than 15%, the tumor is considered to be less aggressive, and when an indicator is more than 30%, the tumor is considered to be highly aggressive and connected with the high risk of development.

P53 is the transcriptional factor regulating a cellular cycle and performing the function of a suppressor of formation of malignant tumors. At an increased

level of p53 expression in the patients with BC, the considerable reduction of survival index is noted.

PIK3CA plays the key role in regulation of the processes of growth, proliferation, differentiation, survival and metastatic activity of a tumor cell. *PIK3CA* mutation is defined in 23% of HER2 – positive BC and, as a rule, is associated with the poor response to treatment.

Now the majority of hereditary cases of BC is associated with *BRCA1* and *BRCA2* genes. The role of these genes is that they regulate the normal growth of cells and prevent possible cancer growth. Despite the presence of abnormalities or mutations in these genes, they promote the increased risk of BC.

Thus, the hormonal status and genotype have the essential meaning as a predictive factor and they are taken into account at hormonal therapy and chemotherapy.

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OSTEOARTHRITIS BIOMARKERS

Osteoarthritis (OA) is a long-lasting chronic inflammation of the joints with their degenerative and dystrophic changes. In recent years the relationship between the induction of inflammatory and degenerative diseases of the joints with the effect of negative environmental factors (hypothermia and the effect of chemical toxins) or joint trauma has been widely discussed. In addition, such factors as age, genetic predisposition, gender, metabolic status and obesity contribute to the likelihood of developing the disease.

Hence, the timely diagnosis and prognosis of the disease on the basis of the identified biomarkers of the disease are of importance. Among the likely candidates associated with osteoarthritis are catabolic biomarkers (urinary C-terminal telopeptide of type II collagen and cartilage oligomeric matrix protein), post-genomic biomarkers and the MicroRNA.

Since type II collagen is the most abundant protein in cartilage, C-terminal telopeptide of type II collagen has become the widely accepted biomarker for assessing collagen breakdown. This component in cartilage degeneration may be released into blood, synovial fluid, and urine. The relationship between the concentration of C-terminal telopeptide of type II collagen and the prevalence and progression of osteoarthritis of the knee and hip joints is determined. It has been found that the patients with high levels of C-terminal telopeptide of type II collagen had the increased risk of having osteoarthritis of the knee and hip joints in comparison with the patients with its low level. Cartilage oligomeric matrix protein correlates with cartilage degradation and determines the severity level of the osteoarthritis. In addition to these biomarkers, hyaluronic acid is also included in the group of the catabolic biomarkers. Hyaluronic acid serum level is used as a biomarker to predict