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ONCOLOGICAL DISEASES, MODERN WAYS OF TREATING AND PREVENTIVE MEASURES

"In the case of covert cancer it is better not to use any treatment because patients if treated quickly die, therefore without treatment they can live for a long time."
The treatise "Carcinoma" aphorism 38 (250 BC)

The aim of this study was to investigate the oncological disease, modern ways of their treating and preventive measures. On the basis of this research the data from different materials were received.

Oncology - the science that studies the causes, mechanism of development and clinical expression of the tumor, as well as methods of diagnosis, treatment and prevention [1].

During the long history of humanity methods of tumor removing or "baking" of external sites were occasionally applied. The first successful surgery of cancer was of the sigmoid colon (Reubard, 1833), stomach (Billroth, 1874, Paean, 1879, Shlater, 1898), breast cancer (Halstead, 1889), kidney (Orlovsky, 1884) [2].

Then an effective vaccine to prevent cervical cancer was developed in 2005 year. All these discoveries show that humanity is making progress in fighting the cancer, even more rapidly nowadays. Although the disease is now developing even faster all over the world killing millions of people, among them even children. The causes of cancer, though, can be treated on early stages.

Tumors are divided by a set of clinically-microanatomical manifestations and changes into benign and malignant.

Most Common Types of Benign Tumors

- Adenomas (epithelial tissue that covers the organs and glands)
- Meningiomas (brain and spinal cord)
- Fibromas or fibroids (connective tissue of any organ)
- Papillomas (skin, breast, cervix, and mucus membranes)
- Lipomas (fat cells)
- Nevi (moles)
- Myomas (muscle tissue)
- Hemangiomas (blood vessels and skin)

Depending on the location and size of a benign tumor, treatment might not be necessary. Doctors will monitor it, track patient symptoms and do tests at specific intervals.

Most Common Types of Malignant Tumors

- Sarcomas (connective tissues such as muscle, tendon, fat, and cartilage)
- Carcinomas (organs and gland tissue such as the breast, cervix, prostate, lung, and thyroid)

Malignant tumors may not have symptoms initially and the first indication that something isn't right may be the detection of a painless lump. These types of tumors are "elastic," which enables them to grow fairly large before they are detected [5].

The main causes of cancer. Mutation of normal gene leads to cancer. Mutated gene that causes cancer is called oncogene and multiple mutations leads to tumor growth. The old cells or those that do not function die and new ones occupy their place. However, cancer cells do not die, they continue to divide rapidly and produce millions of new cancer cells. Tissue atypism is sizes and shapes of tissue structures change, sometimes is the total loss of morphological tissue signs. Cell atypism is performed by cellular and nuclear polymorphism: change of the shape, size, structure, color, quantity, size of chromosomes. Morphological atypia is a violation of organotypical, histotypical, cytotypical differentiation. In benign tumors it is a violation of organotypical and histotypical differentiation. In malignant first typical violation is of cytotypical differentiation. Atipizm physicochemical: increasing of water and potassium content (stimulation of growth and reproduction), a decrease of calcium and magnesium (decrease of cell-cell adhesion, development the capacity for invasion and metastasis); increase of the negative cell charge and electrical conductivity [3]. Functional atipizm - loss, gain, distortion of functions; discrepancy of tumor functioning in regulatory influences. The distortion appears in not characteristic functions of tumor - ectopic endocrine syndrome.

Metastasis - the formation of secondary tumor lesions due to the acquisition of the ability of tumor cells invade into the surrounding tissue, penetration into the blood and lymph vessels, survival and reproduction in no inherent microenvironment. Lymphogenous metastases - metastases in regional lymph nodes. Hematogenous metastases - secondary tumor foci in other organs resulting in hematogenous spread of tumor cells (emboli). Implantation metastasis arising from the spread of cancer cells on the surface. To form a secondary tumor, tumor cells need to leave the vascular bed and penetrate into the tissue. Cells must attach to cells of the vascular wall followed by a sprouting. One of the surviving cells is enough for new metastatic lesions, other survivors create new colonies of cancer. Malignant neoplasms - diseases that arise from abnormal proliferation of cells characterized by functional, metabolic and structural atypia and susceptibility to uncontrolled reproduction.

The main causes of malignant tumors:

- Smoking - 30%
- Diet Features- 35%
- Infections - 10%
- Professional factors - 4.5%
- Ionizing radiation - 4.5%
- Alcohol - 2.3%
- Ultraviolet radiation - 2-3%
- Air pollution - 1-2%
- Reproductive factors - 4.5%
- Low physical activity - 4.5%

Disease rate - the number of ill malignant neoplasms per 100 000 population per year. Mortality rate - the number of the dead from cancer per 100 000 population per year. Every year in the world more than 10 million people are suffering from cancer and approximately 8 million die from it [7].

Treatment of cancer patients nowadays:

Radical treatment is considered when after the whole therapy tumor foci do not remain.

Palliative treatment is that when after the therapy of non-iliminated tumor foci both in the area of the primary lesion and in distant organs stay in the body. Symptomatic treatment involves eliminating complications that threaten the life of a cancer patient. Specialized treatment. Basic methods – surgical; radiotherapy; chemotherapy. Additional methods - hormone therapy; immunotherapy [6].

Future Cancer Treatment Methods

The growth in knowledge of cancer biology has led to remarkable progress in cancer early detection, treatment and prevention in recent years. Cancer research is currently advancing on so many fronts that are highlighted below.

Antiangiogenic chemotherapy

Recently, in many clinical trails angioinhibitors were also being used in combination with conventional chemotherapy. Clinical trails generally combine very low-dose of chemotherapy followed by angioinhibitor therapy. Combination of angioinhibitors will need to be tested vigorously in the future, as single angioinhibitors are approved for use of cancer. For example, it is very important to know whether bisphosphonates are synergistic with certain natural angioinhibitors such as angiostatin, endostatin, thrombospondin, arresten, canstatin tumstatin etc. Preventive angioinhibitory therapy may also be possible in the future, because angioinhibitory therapy is generally less toxic and less susceptible to induction of acquired drug resistance. Recently, some reports suggested that some foods have angioinhibitory substances. It is also better to test food that has high levels of natural angioinhibitors for prevention of cancer.

More targeted treatments

As more is learned about the molecular biology of cancer cell, researchers developed new classes of molecules such as antisense oligodeoxynucleotides and small interfering RNA (siRNA) for the treatment of cancer.

Nanotechnology

It is the use of extremely tiny particles for diagnostic imaging to more accurate location of tumors for delivering drugs more specifically and effectively into cancer cells.

RNA expression profiling and proteomics

RNA expression profiling permits scientists to determine relative amounts of numerous RNA molecules at one time. Knowing what proteins or RNA molecules are present in cancer cell can tell lot about how a cell is behaving and often can help to predict which drugs that particular tumor cell is likely to respond.

Finally winning the war against human cancer has been the focal point of present medical research. Single “cure-all” drug for cancer has not yet been developed, even though many new cancer treatment methods and drug targets have been discovered. The complexity of cancer disease requires scientific battle to fight against cancer in all frontiers [4].

Prevention of cancer is divided into 3 categories:

Primary prevention of cancer: the fight against smoking, promotion of proper nutrition and a healthy lifestyle; these methods allow to reduce the incidence of cancer to 1.5-2 times.

Secondary prevention - detection and treatment of precancerous diseases; screening programs to detect precancer and early cancers; ultrasound and mammography

in women; test for occult blood in colorectal cancer; cytological screening for cervical cancer; endoscopic screening for gastric cancer is used to transfer the disease to curable .

Individual prevention of cancer based on detection of inherited genetic defects (adverse phenotype occurs in 40-50% of the population).

Key tasks and activities have been specified vis-à-vis the specific course of action. The planned policy result is a limited disease development risk, reduced number of advanced cases, extended life expectancy of oncologic patients and improved quality of life.

CONCLUSION

Everyone should take care of their health and undergo preventive examinations once a year; only prevention and timely diagnosis protect from the disease. Everything must be done to prolong life and improve its quality. You need time to recognize the disease. You need time to be consistently treated by strictly fulfilling all the recommendations of doctors. It is necessary to cooperate with them, knowing what to do and why. And even when there is no hope of recovery every person can live with dignity and happily a lot of time due to the proper care, psychological and spiritual support of others.

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