The technosphere and the noosphere merge into a tandem of information signals and communication media, forming an information environment i.e. media environment [3; 4]. The term "media environment" is denoted as the environment surrounding a person, formed by technical means of information transfer and carrying out the involvement of a person in macro- and micro-groups (starting with communication with the nearest social environment, and up to regional, state, international contacts and interactions), as well as forming new social, material and spiritual conditions of human existence and activity. Any interaction between the organism and the environment exists in the form of mutually conditioned contacts, so in the case of the media environment, a person acts as its creator, designer and the main regulating mechanism, and the environment in turn provides him with the resources necessary for existing in it and has a specific ecological impact on him.

The ability of the information environment to influence the state of a person's mental, physical and social well-being form the need for measures to improve the ambient information environment. The basic medical and ecological features that the information ecology collides are:

- the impact of information on the human thinking process. Also, information flows affect not only mental work, fatigue, impaired attention, but also the possibility of philosophical criticism of the information from the media;
- information stress, as a factor in the development of diseases of the cardiovascular, nervous, digestive and immune systems;
- the impact of information flow on the human subconscious;
- reduction of individual or population psychological potential (opportunity to carry out a productive life activity);
- the influence of psycho-social information factors on the occurrence of disabling mental disorders, behavioral dysfunctions, such as anxiety, depression, psychosomatic disorders, suicide [1].

In light of these, we can talk about the importance of the existence of disciplines which study people and the information space, as well as disciplines aimed at preventing and minimizing the harmful impact of media space on human.

In this field, works by a physician, a member of the British Ecological Society A. L. Eremin, who studies the field of information hygiene, which forms environmental strategies based on models of the higher nervous activity of a person, are the most important. Hygienic norms, built on neural activity, excitation and inhibition processes, reflex arcs and other nervous activities, can be used to prevent the negative influence of information on a human [2].

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ANALYSIS OF RADIOBIOLOGICAL PLANNING OF IRRADIATION BREAST TUMORS BASED ON THE MONACO SYSTEM

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The role of radiobiological planning of radiation therapy at treatment of a malignant tumor of a breast tumor has been specified. Three main techniques of planning of radiation therapy applied at the Minsk city clinical oncologic dispensary are surveyed. They are: 3D conformal radiation therapy, intensity-modulated radiation therapy (IMRT), volumetric modulated arc therapy (VMAT). Advantages and disadvantages of these techniques are described, the area of their use is designated.

Keywords: radiobiological planning, intensity-modulated radiation therapy, volumetric modulated arc therapy, breast tumor.

Various quantum and corpuscular radiations can be applied to impact on a cancer tumor. The efficiency of modern radiation therapy is defined by optimum calculation of a dose of radiation and high precision of her leading to the patient. Any malignant tumor is unique in nature. Therefore, there is no universal method of radiotherapy, effective for the treatment of any malignant neoplasm. The traditional course of radiation therapy for left breast cancer is accompanied by impact of high doses of radiation to the lungs and the heart. Before starting the course of irradiation of the breast tumor, it is necessary to carefully develop his plan. It will provide the maximum effect of radiation therapy and reduce the risk of serious radio induced cordial complications (ischemic heart disease and myocardial infarction). The purpose of radiobiological planning of radiation therapy is to define the minimum possible zone of radiation which at the same time will provide full impact on all elements of a tumor.

One of the main areas of work of the Minsk city clinical oncologic dispensary is modern radiation therapy. It is equipped with two modern linear accelerators Versa HD and Elekta Infinity. As at a breast tumor the target lies on a surface, radiation therapy is made by fascicles of photons with energy 6 MV. Calculation of plans of radiation therapy is performed on the basis of the system of planning of sessions of the radiation therapy modulated on intensity and volume of Monaco. The planning of the Monaco system is one of technologies of new generation. It provides a possibility of use of function of combination of images, contour imaging, simulations and visualization of plans. Its application increases efficiency of beam influence on the basis of spatial and temporary distribution of the dose of ionizing radiation.

In the planning of radiation therapy three main techniques are used.

1) 3D conformal radiotherapy (3D CRT). The main disadvantage of the traditional course of 3D-conformal radiation therapy at breast cancer is that the high doses of radiation it lead to the risk for organs – lungs and heart. Side effects of radiation arise only in radiation zone. For the decrease of heart overloading, the tangential movement of fascicles of radiation is used. Calculation 3D CRT of plans in the Monaco system is carried out with the use of an algorithm Collapsed Cone. At assessment of the cover it is necessary to consider that that 90 % of a dose (45 Gr) have to cover more than 90 % of volume of a zone of processing. "Hot spots" make 107 % of a dose (53,5 Gr).

2) IMRT stands for intensity-modulated radiation therapy. IMRT is a type of radiation therapy in case of which by means of the linear particle accelerator the radiation bundles, which are precisely corresponding to the form of a tumor are created. Each bundle of radiation to be divided into a set of the small-sized bundles capable to change intensity. IMRT provides high doses of radiation in a zone of a tumor and the lowered doses in the field of healthy fabrics Besides, IMRT can create concave area on the edge of a field of radiation therapy. Application of this technique requires more long and careful planning. The quality of treatment by radiation therapy with intensity modulation is much better, than in case of traditional conformal radiation. Treatment of breast tumors is performed by seven fields. Each field breaks on 24-27 segments. Calculation of plans is performed with use of an algorithm of Monte Carlo. At assessment of a covering it is necessary that 95 % of a dose (47,5 Gr) a cover more than 95 % of volume. "Hot spots" make 110 % of a dose (55 Gr). At the same time, the maximum dose on a target doesn't exceed 115 % of the brought dose (57,5 Gr).

3) VMAT is volumetric modulated arc therapy. VMAT is a new type of a technique even more targeted, more effective and more comfortable for the patient. The equipment for radiotherapy at such treatment rotates around the patient. The intensity of a bunch of radiation constantly changes. The quantity of degrees of freedom of radiation increases. Advantages of radiation therapy on VMAT technology: high precision; short terms of treatment; lower doses of radiation. It reduces risk of negative long-term side effects.

Covering assessment by a technique of VMAT is made as well as for IMRT of plans. For the calculated plans of radiation therapy by the IMRT and VMAT methods the expected time of a holiday of a dose was 282,76 and 108,01 seconds. At the same time quantity of monitor units for IMRT of the plan 818,13 MU, and for VMAT – 520,84 MU, 3D CRT – 222,28 MU.

Further improvement of methods of radio biological planning of radiation of malignant tumors solves a problem of the most effective aim impact on the pathological center previously calculated radiation dose.