

Materials and methods: we studied the frequency of breast cancer in the region of the Semipalatinsk nuclear test site in view of the radiation risk zones in comparative perspective (for the period 1971–2011, according to data provided by the Department of Health of the former Semipalatinsk and Eastern Kazakhstan Province).

Research results: throughout the period analyzed, the incidence of breast cancer had a significant upward trend. The cumulative value increase from 1971 and 2006 amounted to 5 times (from 5,2 to 26,2 per 100,000 people a year). From 2006 to 2011, no significant changes in the incidence have been identified. Throughout the study, trend indicator was directed upward, indicating a continuing trend to its further increase.

There were significant differences in the radiation risk zones. The peculiarity of this indicator in the area of extraordinary radiation risk is a significant excess of its average value for the region and the republican average, existing throughout the whole period of study. A similar but less pronounced trend was found in the zone of maximum radiation risk.

The main feature of breast cancer incidence in the area of minimum radiation risk is its gradual growth, generally corresponding to the average national rate trends.

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VASCULAR ENDOTHELIUM DISORDERS AT THE MALIGNANT TUMORS AND CHRONIC IONIZING RADIATION

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Malignant neoplasms of rectum are among the most common diseases. Despite the relative simplicity of the diagnostics, the possibility of hidden course and frequency of metastasis causes significant frequency of inoperable forms undergoing conservative treatment (radiotherapy and chemoradiotherapy). In most cases, patients have systemic complications of oncological process, manifested by thrombosis and suppression of the immune system with a predisposition to infectious processes. Although the genesis of these complications has been studied for a long time, it has not been fully explored yet. State of the vascular endothelium is relevant as a potential modifying factor in the genesis of malignant neoplasm complications in persons exposed to ionizing radiation during their lifetime (due to the activity related to SNTS – Semipalatinsk Nuclear Test Site).

Objective: To determine the characteristics of endothelial factors in colorectal cancer in people subjected to the effect of ionizing radiation.

Materials and methods: two groups of people with colorectal cancer malignancies + control group. Methods of endothelial function study: the content of exfoliated (circulating) endothelial cells in peripheral blood; the content of NO metabolites (NO met.) in the blood; endothelium-dependent vasodilation definition (EDVD).

Research results: there were revealed statistically significant differences in terms of the circulating endothelial cells content in peripheral blood between the groups. The excess over the control group was the most pronounced (M2M1 = 2,23; M3M1 = 3,40). Excess of this indicator in patients with radiation history proved to be significant (M3M2 = 1,53). We can suggest the likelihood of vascular endothelial lesions in exposed individuals before the onset of tumors or that aggravating the effect of tumor process on the state of endothelial cells. Content of NO metabolites in the blood of the examined patients was increased; its average values in the group of irradiated patients were lower than those in the comparison group (M2M3 = 1,08). Given the important role of NO in the regulation of aggregation and spontaneous platelet disaggregation process, it must be assumed that the relative decline could play a role in the sharp decrease in the disaggregation activity.

According to the mean values of EDVD degree, M1M2 differences amounted to 1.46, M1M3 = 1,96 and M2M3 = 1,34. Thus, all obtained instrumental and laboratory data confirmed the presence of endothelial dysfunction in patients with malignant tumors of the colon and rectum and its greater degree in those with a history of chronic ionizing radiation.

Thus, signs of endothelial dysfunction, reduced endothelium-dependent vasodilation and increased amount of circulating endothelial cells in the blood levels is common to both groups of patients examined, with and without ionizing radiation exposure history. There are differences between the groups of patients depending on the effects of ionizing radiation. The exceeding extent of vascular endothelium damage regularly appeared in individuals with malignancies, previously exposed to radiation as a result of living in areas of SNTS radiation risk.

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THE CANCER INCIDENCE IN SEMEY REGION OF KAZAKHSTAN REPUBLIC

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The problem of morbidity and mortality from cancer is one of the most topical problems in modern medicine, as it affects the interests of all