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The influence of NOS inhibitor on severity of acute radiation skin reactions

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Introduction. The emergence and treatment of radiation injuries is an extremely difficult problem despite the improvement of methods and technologies of radiotherapy. A few available drugs do not provide a satisfactory solution of this problem due to its high toxicity and low tolerance for oncological patients. In this regard, absolutely new approaches to the development of effective prevention of radiation therapy complications are very relevant.

One of the perspective ways to reduce the disability of cancer patients can be the usage of drugs that selectively protect normal tissues in radiotherapy. It is known that such properties are possessed by new original isothiourea derivatives (ITU), synthesized in the laboratory of radiation pharmacology of A. Tsyb MRRC. These compounds can inhibit nitric oxide synthases (NOS) and act as hypoxic radioprotectors.

The purpose of this work was the development of models and schemes of local radiotherapy of tumors using the NO-synthase inhibitor as a radioprotector for the prevention of acute radiation injuries.

Materials and methods. The investigations have been done in female mice weighing 22-26 g. The animals were irradiated by γ -rays at a dose of 30 Gy. INOS1 was administrated at a dose of 75 mg / kg 30 min before exposure. Ehrlich carcinoma was used as a tumor model. Assessment of the severity of acute radiation reactions of the skin was carried out according to the classification of RTOG / EORTC-95.

Results. We obtained experimental model of acute radiation injuries of the skin in mice. The ability of the NOS inhibitor to influence the degree of the radiation response to γ -radiation at various doses was evaluated. The anti-radiation effect of NOS inhibitor was shown on the model of Ehrlich carcinoma. Administration of INOS1 in optimal radioprotective dose ($\frac{1}{4}$ LD16) before irradiation at a dose of 30 Gy didn't reduce the anti-tumor efficacy of radiation exposure, but significantly limited the degree of radiation alteration of the deep layers of the skin and underlying tissues.

Obtained results indicate the perspective of the chosen approach to the prevention of post-radiation complications in oncology and continuation of studies.

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Primary author: SAMSONOVA, Alina (Russian)

Co-authors: Mr FILIMONOV, Alexander (A. Tsyb Medical Radiological Research Center - branch of the National Medical Research Radiological Center of the Ministry of Health of the Russian Federation); Mrs CHESNAKOVA, Ekaterina (A. Tsyb MRRC - branch of the National Medical Research Radiological Centre of the Ministry of Health of the Russian Federation); Ms SHEVCHENKO, Ljudmila (A. Tsyb Medical Radiological Research Center - branch of the National Medical Research Radiological Center of the Ministry of Health of the Russian Federation); Dr FILIMONOVA, Marina (A. Tsyb Medical Radiological Research Center - branch of the National Medical Research Radiological Center of the Ministry of Health of the Russian Federation); Ms KORNEEVA, Tatiana (A. Tsyb Medical Radiological Research Centre - branch of the National Medical Research Radiological Centre of the Ministry of Health of the Russian Federation (A. Tsyb MRRC)); MAKARCHUK, Viktoriya (A. Tsyb Medical Radiological

Research Centre - branch of the National Medical Research Radiological Centre of the Ministry of Health of the Russian Federation)

Presenter: SAMSONOVA, Alina (Russian)

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