

UDC 577.152.6

EXPRESSION PROFILE OF FATTY ACIDS IN THE LIVER AND GUERIN'S CARCINOMA OF RATS UNDER CONDITIONS OF Ω -3 POLYUNSATURATED FATTY ACIDS ADMINISTRATION

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Introduction. Omega-3 (ω -3) fatty acids are essential nutrients, because they cannot be synthesized endogenously. Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) (ω -3) decrease inflammation by competing with arachidonic acid (AA) (ω -6) as enzymatic substrates and serving as precursors of resolvins and protectins. A high ω -6 intake relative to ω -3 fatty acids may contribute to cancer risk, because a low ω -3/ ω -6 ratio in tissue can create a proinflammatory milieu and thereby promote tumor formation and progression. The aim of this study was to evaluate the modification of fatty acid profiles in the liver and Guerin's carcinoma microsomal fraction in rats under conditions of ω -3 polyunsaturated fatty acids (PUFAs) administration.

Methods. The experiments were performed on white female rats. Guerin's carcinoma was used as a cancer model. 0.5 ml of 30% carcinoma cell suspension in normal saline was injected subcutaneously into thigh of a hind limb. The animals were administered ω -3 PUFAs for 4 weeks prior to the carcinoma implantation and then for the entire duration of tumor growth. A daily dose was 120 mg of ω -3 PUFAs per kg of body mass. The content of fatty acids in the microsomal fraction was analyzed by HRGC 5300 gas chromatography in glass column with Chromosorb W/HP sorbent in 10% Silar 5CP liquid phase.

Results. In the liver microsomal fraction of the tumor-bearing rats during the intensive growth of the tumor (14 days, which corresponds to the logarithmic phase of oncogenesis) the levels of AA and linoleic acid (LA) (ω -6) were higher, whereas the

levels of DHA were significantly lower as compared to controls. The ω -3 PUFAs administration prior to and post-implantation of tumor leads to increasing DHA and EPA, decreased level of AA in comparison to tumor-bearing rats that had not received the lipophilic nutrients. We found increased levels of DHA, EPA, LA and AA in microsomal fraction of Guerin's carcinoma in animals of the group that was administered ω -3 PUFAs both before and after implantation of the carcinoma during logarithmic phases of carcinogenesis.

Discussion. The high level of DHA and EPA in the liver microsomal fraction of rats can be associated with the ability of ω -3 PUFAs to be incorporated into membrane phospholipids and replace the content of ω -6 PUFAs in their composition while the ratio of ω -6/ ω -3 PUFAs decreases from 4/1 to 2/1. The high level of LA and AA in tumor microsomal fraction of rats may indicate a decrease in their metabolism as a result of competition with ω -3 PUFAs for metabolic enzymes. However, the ratio of ω -6/ ω -3 PUFAs in tumor tissue decreases from 5/1 to 2/1.

Conclusions. The ratio of ω -6/ ω -3 PUFAs plays an important role in the metabolism of PUFAs of the liver and tumor and may be seen as a potential marker for prognosis of tumorigenesis.

Acknowledgments. We express gratitude to Prof. M.M. Marchenko for the valuable guidance and constant encouragement we have received during the course of our work.