

CAN PRENATAL IRRADIATION PROTECT THE EMBRYO FROM TUMOR DEVELOPMENT?

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Abstract

Although the processes of cell proliferation and differentiation are—without comparison—most pronounced during early embryonic life, this period, before and during organogenesis, appears to be highly resistant to carcinogenesis. One possible explanation for this paradox could be that cancer is controlled by the regulators influencing development, regulators that are most active during early embryonic life. In addition, it seems that under certain conditions, as shown by experiments on rat brain, prenatal irradiation can decrease rather than increase the subsequent carcinogenic effect of a chemical carcinogen. The possible reasons for this are discussed.

Key words: Embryo, tumor, carcinogenesis, irradiation.

those exposed in utero approach middle-age, they do indeed seem to develop a higher than normal rate of adult malignancies—but not leukemia or embryonic tumors (22). This may indicate that although an immediate carcinogenic effect was not detectable, in utero cancer initiation may have taken place.

Experimental studies in animals may offer us a clearer picture of the connection between prenatal x-ray exposure and subsequent tumor development.

In a review on prenatal effects of irradiation, Brent (23) presents a compilation of the effects of irradiation at various stages of gestation in rat and mouse. He reports, that 100 R irradiation during the late fetal stages does lead