ONCOLOGY

THE EFFECT PRODUCED BY A SECOND IMPLANTATION OF AN EHRLICH ADENOCARCINOMA UPON THE RATE OF TUMOR GROWTH IN VARIOUS REGIONS OF THE BODY

O. I. Epifanova and I. N. Smolenskaia

From the Histophysiological Laboratory (Chief — Candidate in Biological Sciences V. N. Dobrokhotov) of the Institute of Experimental Biology (Director — Prof. I. N. Maiskii) Acad. Med. Sci. USSR, Moscow

(Received May 28, 1957. Presented by Active Member Acad. Med. Sci. USSR N. N. Zhukov-Verezhnikov)

In a previous communication [3] it was stated that the Ehrlich adenocarcinoma would grow more rapidly when implanted in the region of the anterior limbs as compared with the posterior [2] even when the animal received an inoculation of two tumors at the same time. When the animal received two-tumor inoculations at a ten-day interval the results obtained did not seem to be consistent.

In view of this, it seemed feasible to investigate in more detail the effect which a second tumor inoculation has upon the rate of adenocarcinoma growth in various regions of the body.

EXPERIMENTAL METHODS

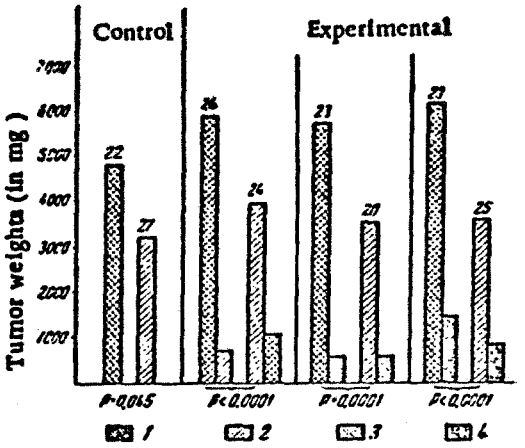
200 sexually mature female mice weighing 20 g were used. In order to produce the subcutaneous tumors, 0.2 cc of the Ehrlich adenocarcinoma preparation was injected each time.

The first injection was given to one-half of the animals in the region of the right anterior extremity while the other half of the animals received the injection in the region of the right posterior extremity. Then all the animals were divided into 8 groups. The mice of 6 groups received ten days after the first inoculation a second inoculation of the tumor into various regions of the body. 2 groups of mice did not receive a second inoculation and served as controls. The weight of the tumors was determined when the animals were sacrificed 20 days following the first inoculation, i.e., 10 days following the second inoculation. The growth of the tumors was determined following the mathematical treatment according to the theory of probabilities [4].

EXPERIMENTAL RESULTS

The experimental data are presented on the graph. The average weight of the 20-day tumors, i.e., those inoculated first, in the region of the anterior limbs did not differ in the control from the experimental groups. Neither were there material differences in weight between the 20-day tumors themselves which were inoculated in the region of the anterior extremities. The slight variations were statistically unimportant. The average weights of the tumors inoculated in the region of the posterior extremities were in even better agreement among themselves. At the same time, the average weights of all the 20-day tumors in the region of the anterior limbs in the experimental animals were greater than similar weights of the tumors in the region of the posterior limbs, this difference having statistical significance ($P = 0.0001$ and less than 0.0001).

Thus we are demonstrating that, even in the presence of a second focus of tumor growth produced by the repetition of the inoculation, there is still a more rapid growth in the region of the anterior extremities as compared with the region of the posterior extremities so that this fact, established in our previous studies, still holds true.



Average weights of the Ehrlich adenocarcinoma on the 20th day after inoculation and in the presence of 10-day tumors implanted in various body regions.
1) Right anterior extremity; ;2) right posterior; 3) left posterior; 4) left anterior. Number above the columns — number of animals with inoculated tumors.

These results do not confirm the opinion we had advanced earlier [3] about the possibility of an upset of the originally determined rates of growth by the second inoculation by reason of possible immunological alterations induced by the introduction of the second tumor. The results of our previous experiment [3] in which the growths in the anterior regions did not exceed the growth in the posterior regions may be explained, apparently, by a depression of the primary growth by the second inoculation. This last, as has already been stated [3], does not agree with the concepts of other workers who believe that the resistance of the organism affects subsequent inoculations while, at the same time, exerting no influence on the rate of growth of the preceding tumors [1].

The present study appears to demonstrate that the previously established difference in the rates of tumor growths between the anterior and posterior regions of the body is a more constant relationship than previously supposed and manifests itself regardless of the location of the second tumor inoculation.

SUMMARY

In previous experiments it has been demonstrated that tumors grow more rapidly in the anterior regions of the body than in the posterior. In the present study we have demonstrated that this is an even more constant relationship than previously supposed. It holds true regardless of where the second tumor inoculation is made.

LITERATURE CITED

[1] F. M. Brikker and L. I. Timofeeva, In the book: Antitumor Immunity,* 9-19, 1939.

[2] O. I. Epifanova, Biull. Eksptl. Biol. i Med. 42, 11, 55-57 (1956).**

[3] O. I. Epifanova and I. N. Smolenskaia, Biull. Eksptl. Biol. i Med. 43, 4, 90-93, (1957).**

[4] V. I. Romanovsky, Use of Mathematical Statistics in the Experimental Field,* Moscow-Leningrad, 1947.

* In Russian

** Original Russian pagination. See C. B. Translation.