ONCOLOGY

THE EFFECT OF SHORT-TERM INHIBITION AND STIMULATION OF THE CENTRAL NERVOUS SYSTEM ON THE IMMUNOLOGICAL SENSITIVITY OF THE SYSTEM TO CANCER ANTIGEN

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The purpose of our work was to discover the effect of short-term stimulation and inhibition of the central nervous system, produced only at the moment of immunization, on the rate at which antibodies are formed to cancer antigen.

EXPERIMENTAL METHOD

The experiment was set up on 12 rabbits of one breed, age, sex and weight (2150-2300 g), divided into two experimental groups and one control (4 rabbits in each group).

The central nervous system of the animals in the first experimental group was inhibited one hour prior to the administration of the immunizing agent by the injection of chloral hydrate dissolved in 10 ml of distilled water (0.5 g of soporific per 1 kg of weight). Medicated sleep began 30-40 minutes after the administration of the chloral hydrate and lasted 3-4 hours; it was so deep that it was accompanied by complete loss of not only the motor, but also the tactile reflexes.

Animals of the second experimental group received subcutaneous injections of a 0.2% solution of caffeine (0.1 ml per 1 kg of weight) before the administration of the antigens. These injections stimulated the central nervous system, increasing the frequency of the respiration as well as increasing the motor activity of the experimental animals for 3 hours.

Rabbits of the third, control, group were not medicated in any way.

Animals of all three groups were immunized simultaneously intravenously by ascitic cells of Ehrlich's adenocarcinoma (diluted 1:20) five times according to the following schedule: 0.5, 1, 1.5, 2 and 2 ml at 3-day intervals.

On the 8th day after the completion of the immunization, blood was drawn from the peripheral vein of the rabbits' ears for subsequent investigation of the complement fixation reaction for the presence of specific antibodies.

EXPERIMENTAL RESULTS

The data which we obtained from the complement fixation reaction using the serum of the experimental rabbits, are presented in the Table.

Formation of Antibodies by Experimental and Control Rabbits (From Data From the Complement Fixation Reaction)

Rabbit group	Rabbit No.	Serum dilution					Control
		1 : 100	1 : 200	1 : 400	1 : 800	1 : 1 600	
First (experimental)	2 091	++++	++++	+++	++	+	—
	2 488	++++	+++	++	+	±	—
	2 795	++++	+++	++	+	—	—
	2 769	++++	+++	+++	++	+	—
Second (experimental)	2 097	+++	++	++	+	+	—
	2 081	+++	++	+	+	±	—
	2 274	++++	++++	+++	++	+	—
	2 301	+++	++	+	+	—	—
Third (experimental)	2 758	++++	+++	+++	++	+	—
	2 490	++++	++++	++	++	+	—
	2 040	+++	+++	++	+	±	—
	2 886	+++	++	++	+	±	—

As is apparent from the data in the Table, the titer of the antibodies specific for cancer antigen in the sera of rabbits in deep drugged sleep at the time the antigen was administered (first group) and in the sera of rabbits in a state of stimulation during this time (second group), varied between 1:800 and 1:1600 and did not differ from the specific antibody titre of the control group of rabbits which were immunized without any additional medication of the nervous system.

These data permit the conclusion to be drawn that short-term action on the central nervous system, taking place only at the time the immunizing agent is administered, is insufficient to change the immunological activity of the animals with respect to cancer antigen.