IMMUNODEPRESSIVE ACTION OF ONCOGENIC VIRUS SA7(C8)

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Virus SA7(C8) gives rise to immunodepression in adult CBA mice and the time interval between injection of the virus and test antigen is an essential condition for its action. Sheep red cells were used as the test antigen. The immune response was determined by Jerne's test. A single injection of SA7(C8) virus in an oncogenic dose into newborn CBA mice led to prolonged immunodepression with respect to hemolysins against sheep red cells, particularly marked in the early stages of carcinogenesis.

The impression has been created that carcinogenic agents of different nature possess at least one universal property, that of the ability of induce immunodepressive states [2-13]. The oncornaviruses have been studied in fair detail from this point of view [3-5, 7, 9, 10], but the oncogenic DNA-viruses have been inadequately studied [1], although such investigations could shed light on the general mechanisms of the "breakdown" of the function of immunity caused by various carcinogenic agents and on its role in the development and progression of tumors.

The object of the investigation described below was to study the effect of oncogenic virus SA7(C8) on the immunoreactivity of mice to sheep red cells.

EXPERIMENTAL METHOD

Newborn and adult (females aged 6-8 weeks) CBA mice bred at the Stolbovaya nursery were used. Monkey adenovirus SA7(C8) was grown in a green guenon kidney cell culture and kept at -10°C. A-6 virus was grown in human embryonic kidney cells and kept under the same conditions. Sheep red cells were chosen as the test antigen. The level of the immune response was determined from the plaque-forming activity of the spleen cells in Jerne's test. The SA7(C8) and A-6 viruses were injected into the caudal vein of the adult animals in a dose of 0.1 ml (10^{-3} CPD_{50} in 0.1 ml), while SA7(C8) virus was injected into the newborn animals during the first day after birth in a dose of 0.1 ml subcutaneously (10^{-6} CPD_{50} in 0.1 ml). The experimental mice were divided into groups: 1) virus injected 5 days before the test antigen; 2) 3 days before; 3) type-6 human adenovirus injected 5 days before immunization with the test antigen; 4) injection of virus SA7(C8) 3 days after immunization with the test antigen. Animals inoculated with SA7(C8) virus during the first day of life received injections of sheep red cells on the 10th and 25th days of life. Normal CBA mice of the same age, immunized with the test antigen, acted as the control. Plaque-forming activity of the spleen cells was studied on the 4th day after immunization.

EXPERIMENTAL RESULTS

Hemolysin production in adult CBA mice following intravenous injection of SA7(C8) virus 5 days before injection of the test antigen was inhibited (Table 1). Injection of the virus 3 days before immunization and 3 days after immunization with sheep red cells caused no significant change in the plaque-forming activity of the spleen cells. Type-6 human adenovirus injected 5 days before immunization with the test

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TABLE 1. Effect of SA7(C8) Virus on Numbers of Plaque-Forming Cells in the Spleen (M ± m; n = 6)

Group of CBA mice	Virus injected 5 days before immunization with test antigen	P	Virus injected 3 days after immunization with test antigen	P
Experimental	40 439±6875	<0,001	120 037±3580	>0,05
Control	158 202±4865		158 202±4865	

Legend. Numbers of plaque-forming cells in the spleen determined on 4th days after immunization.

TABLE 2. Decrease in Number of Plaque-Forming Cells to Sheep's Red Cells in Spleen of CBA Mice Inoculated at Birth with SA7(C8) Virus (M ± m; n = 5-6)

Group of CBA mice	Number of plaque-forming cells at various times after injection of virus			
	10th day	P	25th day	P
Experimental	39±6,2	<0,05	1967±625	<0,05
Control	413±51		8907±1052	

Legend. Number of plaque-forming cells in the spleen determined on 4th day after immunization with sheep's red cells. Immunization carried out on either the 10th or the 25th day of life.

antigen likewise inhibited hemolysin production. Immunodepression with respect to hemolysins against sheep red cells, induced by injection of monkey adenovirus SA7(C8) into adult CBA mice, was evidently due to "damage" to the inductive phase of immunity, although its effect on the productive phase of the immune response cannot be ruled out. An essential condition for the immunodepressive effect of SA7(C8) virus was the time interval between injection of the virus and the test antigen. Data on the effect of SA7(C8) virus on the formation of humoral antibodies against sheep red cells when injected into animals during the first day after birth are given in Table 2. Injection of SA7(C8) virus into newborn animals led to prolonged immunodepression with respect to hemolysins against sheep red cells: the inhibitory effects of the virus were particularly marked in the early periods of the latent period of virus carcinogenesis and it still persisted to a lesser degree on the 25th day. The immune response is the resultant of interaction between lymphocytes of different origins [7]. The immunodepressive effect of the various carcinogens is evidently due to their action on antigen-sensitive cells or on precursors of the antibody-forming cells or it is caused by interference with interaction between these two types of cells.

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