fluid on the process is not yet clear. Mononuclear phagocytes and tissue macrophages are known to remove IC from the circulation and tissues. Activation of the mononuclear phagocytic system by the action of splenic perfusion fluid may probably lead to the more rapid elimination of IC both from the kidneys and from the blood stream.

The method of elimination of IC developed in New Zealand mice is capable of being utilized, as the results show, to act on an already developed auto-immune process, it does not cause any marked side effects, and it is simple in use, for the course of injections of perfusion fluid lasts only 1 month, a great advantage when compared with known existing methods, requiring injections of preparations for many months.

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EFFECT OF T-ACTIVIN ON EXPERIMENTAL VIRAL MYOCARDITIS

N. N. Kipshidze, M. M. Dzhaparidze, R. V. Bulusashvili, A. V. Khuchua, and N. A. Zviadadze

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Among infectious factors facilitating the development of cardiomyopathies (CMP) in man, Coxsackie virus continues to attract increasing attention of research workers. In recent years much information has been obtained on its role in the development of viral myocarditis (VM) [2, 3, 8, 12, 15]. The hypothesis of a progressive, infectious, predominantly viral myocarditis and its possible transformation into CMP is very tempting [14]. The role of autoimmune disturbances in the pathogenesis of the disease and of the pathogenetic role of T suppressor deficiency in myocarditis and CMP has been widely discussed [6, 13].

The aim of this investigation was to study the effectiveness of the immunomodulating agent T-activin in myocarditis caused by Coxsackie virus in BALB/c mice. To produce experimental VM, the procedure followed in previous studies was adopted [12, 14, 15].

EXPERIMENTAL METHODS

BALB/c mice, male and female, aged 2 months and weighing 16-20 g were infected intraperitoneally with 0.2 ml of Coxsackie B_1 virus in a titer of 10^{-3}-10^{-7} TCD/ml, obtained from the Virus Museum of the Institute of Poliomyelitis and Virus Encephalitis, Academy of Medical Sciences of the USSR. The animals were killed (under general anesthesia) by decapitation

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Institute of Experimental and Clinical Therapy and Institute of Experimental and Clinical Surgery, Ministry of Health of the Georgian SSR, Tbilisi.

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TABLE 1. Mortality Among BALB/c Mice After Intraperitoneal Injection of Coxsackie B_1 Virus in a Titer of 10^{-3}-10^{-7} TCD/ml

Group of animals	Days of experiment			Total
	1—5-th	5—10-th	10-30th	
1	0/16	0/16	0/16	0/16
2	8/64	2/32	2/30	12/64
3	—	0/32	0/32	—

Legend. Groups here and in Table 2: 1) control, 2) infection, 3) infection + T-activin.

TABLE 2. Time Course of Immunologic Parameters during Experiment

Group of animals	Day of experiment	Immunologic parameter, %	
		T-RFC	T lymphocytes
1	5-th	64	20
2		58	9
1	7-th	65	21
2		55	8
3		65	9
1	15-th	64	22
2		54	6
3		56	10

Legend. Group 1) 4 experiments, 2) 4 experiments, 3) 5 experiments.

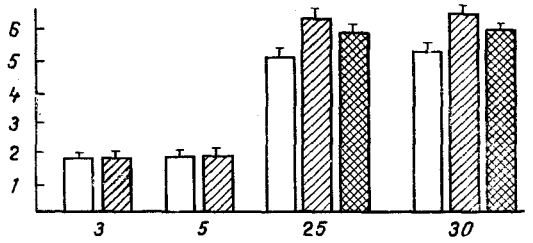

Fig. 1. Ratio WH/BW in mice during experiment. Abscissa) time of experiment (in days); ordinate) ratio WH/BW. Unshaded columns) normal state; obliquely shaded) infected animals; cross-hatched) infected animals receiving T-activin.

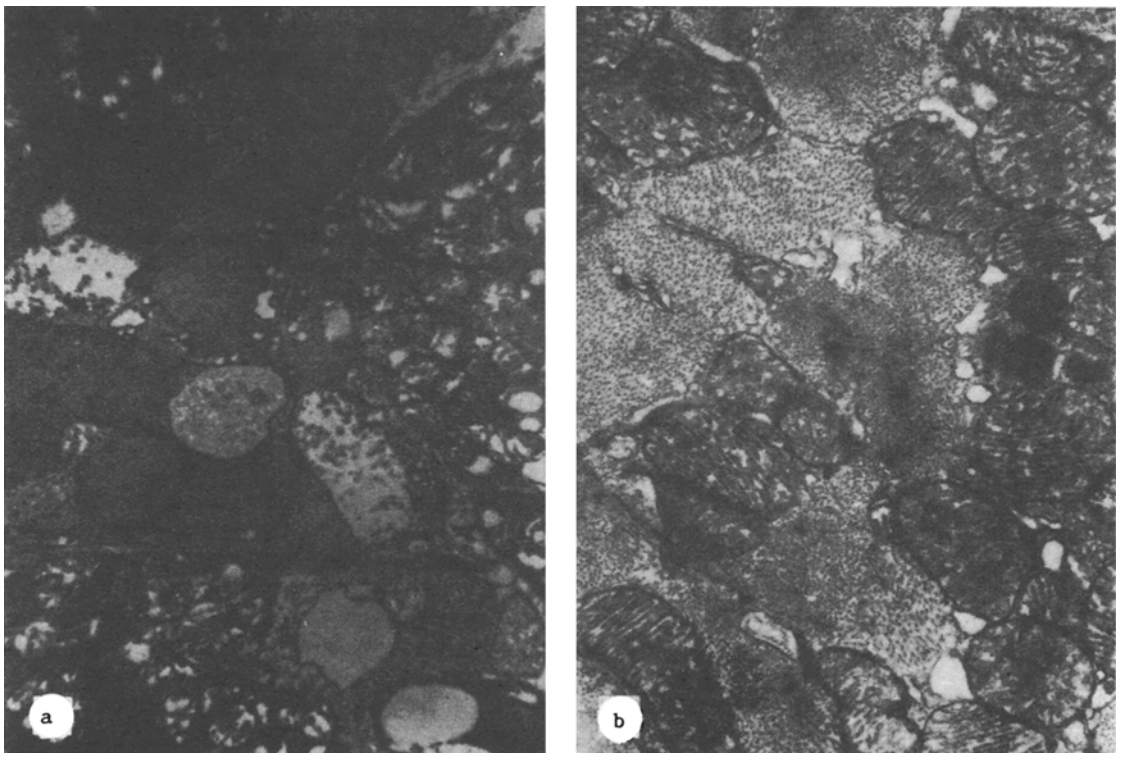

Fig. 2. Left ventricular myocardium of a BALB/c mouse 24 h after infection with Coxsackie B_1 virus. a) No treatment, congestion of blood vessel and destructive changes in mitochondria and myofibrils of cardiomyocytes, 9,000×; b) after treatment with T-activin: ultrastructure of mitochondria and myofibrils of cardiomyocytes is preserved, 10,500×.

and blood was taken for immunologic tests. The T system of immunity of the mice was tested by the spontaneous rosette formation method. The criteria used to assess the reaction, determining the size of the population, were the relative percentage of rosette-forming lymphocytes and their absolute number in 1 mm^3 of blood [4, 10]. Material was taken 5, 7, 15, 25, and 30 days after infection. Intact mice and animals receiving an injection of culture fluid only served as the control. Material was taken from the right and left ventricles (in the region of the apex) at each stage of the investigation for light and electron microscopy. Subsequent treatment of the material was carried out by the usual methods. The preparation of T-activin was injected subcutaneously in a volume of 0.2 ml, at the rate of 0.01 mg/kg body weight, starting on the 5th day of the experiment after infection, daily for 5 days. The ECG was recorded for the duration of the experiment. The ratio of the weight of the heart to body weight (WH/BW) also was studied. Differences between measurements were analyzed by Student's test.

EXPERIMENTAL RESULTS

It will be clear from Table 1 that of 64 infected mice 12 died in the course of 30 days, whereas in the group of mice infected and receiving T-activin, not a single animal died.

The diagnosis of VM in the animals was based on morphological changes discovered by light and electron microscopy. These investigations showed that the morphological changes in the myocardium after injection of Coxsackie B_1 virus depend on the duration of the process. However, a feature common to all times after infection was predominance of the "alterative" component of inflammation (dystrophic, necrobiotic, and necrotic changes) over exudative and proliferative processes. Injection of T-activin reduced the severity of myocardial damage caused by Coxsackie virus (Fig. 1).

The immunologic investigations (Table 2) revealed a decrease in the number of rosette-forming T cells (T-RFC) and of T lymphocytes in the infected mice, whereas in the infected mice receiving T-activin, these parameters showed a tendency to increase. The ECG revealed no rhythm disturbances or pathological changes throughout the experiment (either in the untreated infected mice or those treated with T-activin).

The WH/BW ratio was significantly increased in the infected animals on the 25th and 30th days of the experiment compared with infected mice receiving T-activin. On the remaining days of the experiment the difference was not statistically significant (Fig. 2).

The experimental results showed that T-activin is effective in the treatment of VM. Reports of the use of T-activin for the treatment of patients with various diseases have been published [1, 7, 9, 11]. The results of experimental studies and the presence of various immunologic disturbances in patients with V_M [5, 13] justify the inclusion of the immunomodulating agent T-activin in the combined treatment of VM.

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