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HYPERIMMUNE ANTIVACCINIA GAMMA GLOBULIN FROM ANIMAL SERA

by

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We reported previously that we succeeded in preparing gamma globulin of high activity from sera of various animal species hyperimmunized with vaccinia virus (Marennikova et al., 1958; Marennikova, 1962). When tested in experimental smallpox and vaccinia infection these gamma globulin preparations showed a marked prophylactic and therapeutic effect.

TABLE I

	Groups of rabbits infected with:	Gamma globulin administration			Number of rabbits	
		Route	Time	Total amount ml	Infected	Died of specific infection
1.	A dose known to be lethal	Intra-venou-sly	2 hours after in-fection, then daily for 5-7 days	5.0-7.0	2	0
2.	Same	Not administered				
3.	A dose causing death of 50% of animals	Intra-venou-sly	2 hours after in-fection, then daily for 5 days	8.0	2	1
4.	Same	"	A single dose 2 hrs after in-fection	2.75	2	0

Table I shows results of inoculation of gamma globulin to rabbits infected intravenously with vaccinia virus in a dose causing the death of all or half of the animals. As can be seen none of the infected animals given gamma globulin has perished.

Anti-vaccinia gamma globulins from animal sera were studied for their reactivity in man. No side-effects were observed in humans after the first or repeated inoculations of such preparations. Of 49 persons given animal gamma globulin intramuscularly (3-12 ml as a single dose) only one had itching of short duration on the third day. Generally, this gamma globulin may cause a mild transitory painfulness in the site of injection.

For the purpose of preventing smallpox during an outbreak of this infection in Moscow in 1960 anti-vaccinia gamma globulin was given to a group of persons who had been in close contact with smallpox patients and vaccinated after the contact. Another analogous group was only vaccinated. The results are shown in Table II:

TABLE II

PROPHYLACTIC EFFECT OF ANTI-VACCINIA GAMMA GLOBULIN

Source of infection	Number of persons closely contacted	Gamma globulin administered		Gamma globulin not administered	
		Number of persons		Number of persons	
		Total	Became ill	Total	Became ill
Patient H	6	4	0	2	1
Patient T	15	1	0	14	5
Patient Ca	7	2	0	5	0
Patient Cyp	4	2	0	2	1
Patient R	2	1	0	1	1
Patient D	8	3	0	5	5
Total	42	13	0	29	13

We have used recently for the production of gamma globulin from calf serum a combined schedule of immunization of animals consisting in application of antigen on the scarified skin followed by intravenous inoculation. To eliminate the cytotoxic effect of sera vaccinia virus grown on the skin of calves was employed as antigen.

The activity of gamma globulin preparations was tested by Boulter's method (1957) and by the haemagglutination-inhibition test. In parallel, it was determined the activity of gamma globulin, prepared in the Lister Institute from sera of sheep immunized with vaccinia virus, which was kindly supplied by Dr Bangham. The results are shown in Table III.

TABLE III

Type of gamma globulin	Activity when tested by	
	neutralization in chick embryos	haemagglutination-inhibition
Calf (USSR)		
Batch I	10^4	20480
Batch II	10^8	2560
Sheep (England)	$< 5 \times 10^2$	< 10

As can be seen in Table III, the activity of our gamma globulin is much higher than that of the Lister product.

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