

POSSIBILITY OF REDUCING THE ANAPHYLACTOGENIC
PROPERTIES OF HETEROLOGOUS SERUM
BY DIPHENHYDRAMINE

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The effect of diphenhydramine on the anaphylactogenic properties of antitetanus horse serum was studied in experiments on guinea pigs. The results showed that diphenhydramine effectively reduces the sensitizing properties of antitetanus serum and the anaphylactic reactions of the animal. This effect was more marked if the combined preparation (antitetanus serum, mixed beforehand with diphenhydramine) was used for both the sensitizing and the reacting injection.

A serious obstacle to the widespread use of heterologous antisera at the present time is their high sensitizing ability and the appearance of anaphylactic reactions after their administration for prophylactic or therapeutic purposes. The introduction of the "Diaferm-3" method [1] into serum production has led to a marked decrease in the anaphylactogenic properties of heterologous serum preparations, but nevertheless they still remain substantial.

The object of the present investigation was to study the effect of the antihistamine compound diphenhydramine on the sensitizing and anaphylactogenic properties of antitetanus serum.

EXPERIMENTAL METHOD

Guinea pigs weighing from 300 to 350 g were used. The sensitizing dose of serum was 0.1 ml, injected subcutaneously. The reacting injection of 1 ml serum was given into the heart on the 25th day of the experiment. Diphenhydramine was added to the serum in a dose of 0.5 mg for intracardiac injection and 5 mg for intraperitoneal injection. Batch No. 356 of antitetanus serum manufactured by the Perm' Research Institute of Vaccines and Sera was used in the experiments.

EXPERIMENTAL RESULTS

The results of the 8 series of experiments on 40 guinea pigs are given in Table 1.

The results show that diphenhydramine effectively reduces the anaphylactogenic properties of antitetanus serum and the intensity of the anaphylactic reactions. This effect was more marked if a combined preparation of antitetanus serum mixed beforehand with diphenhydramine was used for both sensitization and the reacting injection.

These results agree with those of Veronesi et al. (described at the 3rd International Conference on Tetanus in Sao Paulo in 1970), who also showed that prolonged keeping (up to 2 years) of antitoxic serum treated with antihistamine preparations had no effect on its specific activity.

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TABLE 1. Effect of Diphenhydramine on Manifestation of Anaphylactogenic Properties of Antitetanus Horse Serum

Series	No. of animals	Sensitization	Reacting injection	Result
I (control)	5	Serum without diphenhydramine	Serum without diphenhydramine	3 - +++
II	5	Ditto	Serum without diphenhydramine; diphenhydramine injected intraperitoneally 15 min later	1 - +++ 2 - No reaction
III	5	"	Serum without diphenhydramine; diphenhydramine injected intraperitoneally at once	1 - + 2 - +
IV	5	"	Serum to which diphenhydramine was added before injection	2 - ++ 1 - ++++ 2 - No reaction
V	5	"	Serum mixed with diphenhydramine (contact for 24 h)	2 - 2 1 - ++ 1 - No reaction
VI	5	"	Serum mixed with diphenhydramine (contact for 1 month)	3 - + 1 - No reaction
VII	5	Serum mixed with diphenhydramine (contact for 24 h)	Serum without diphenhydramine	3 - + 2 - No reaction
VIII	5	Ditto	Serum mixed with diphenhydramine (contact for 1 month)	1 - + 2 - ++++ 5 - No reaction

Note. The column headed "result" gives the number of animals with different forms of anaphylactic shock: mild (+); moderately severe (++); severe (+++); shock terminating in death (++++).

The case for the preparation of heterologous antisera in combination with antihistamine agents therefore requires consideration.

LITERATURE CITED

1. A. V. Beilinson, Antitoxic Sera of High Purity and Concentration and the Development of Commercial Methods of Their Manufacture, Doctoral dissertation, Moscow (1954).