

Prevention of Hypoglycemia During the Induction of Alloxan Diabetes

The Use of Glucose and Antihyaluronidase subcutaneously in the Rabbit

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Hypoglycemia presents a serious problem during the induction of alloxan diabetes in the rabbit.¹ Diabetogenic doses of alloxan usually result in an initial hyperglycemia which is soon followed by severe hypoglycemia. The hypoglycemic phase may last for six to eight hours and be severe enough to cause death unless treated promptly. Inasmuch as hyaluronidase enhances the spreading of exogenous or endogenous elements through mesenchymal tissue² and thereby speeds absorption, a preparation of antihyaluronidase might be expected to delay and prolong absorption.

Experimental: Immediately after the diabetogenic dose of alloxan (200 mg. per kg. of body weight) was given to 3-to-4-month old rabbits of Dutch a.c. strain, 200 cc. of 5 per cent solution of glucose in water with 100 mg. of antihyaluronidase‡ added was injected subcutaneously. Twelve hours after injection, the subcutaneous mass produced by this solution was still palpable, although smaller. It seemed to be absorbed completely within twenty-four hours.

Results: The first three animals so treated became diabetic. On these, blood sugar determinations were not made at frequent intervals. Nevertheless, there was no evidence of hypoglycemia at any time. Three animals treated subsequently were studied more closely. Blood sugar determinations were made 2 hours, 4 hours, 6 hours, 8 hours and 24 hours after the administration of alloxan and glucose. The blood sugar values (representing true glucose) are presented in the following table. The results suggest that the delayed absorption of glu-

cose provided constant feeding to the animal, thereby preventing hypoglycemia.

TABLE 1

Rabbit	Blood sugar mg. per 100 cc.		
	M*	N	O
Fasting	110	100	115
Alloxan and glucose			
2 hours	510	390	430
4 hours	390	415	400
6 hours	375	415	240
8 hours	105	85	95
24 hours	105	55	220
28 hours		70	240
30 hours		70	275
96 hours		335	

*Rabbit M suffered a fractured spine during the injection of alloxan. Death occurred 26 hours later.

SUMMARY

Antihyaluronidase has been administered subcutaneously along with glucose to delay and prolong its absorption and thus obviate the occurrence of hypoglycemia during the induction of alloxan diabetes in the rabbit. Observations showing successful results are reported.

SUMMARIO IN INTERLINGUA

Prevention de Hypoglycemia durante le Induction de Diabete per Alloxano: Le Uso Subcutanee de Glucosa e Antihyaluronidase in Conilios

Antihyaluronidase esseva administrate subcutaneamente insimul con glucosa como retardator e prolongator del processo absorptive pro obviar le occurrentia de hypoglycemia durante le induction de diabete per alloxano in conilios. Es reportate observationes demonstrante le successo del experimento.

REFERENCES

- 1 Goldner, Martin G., and Gomori, George: Alloxan Diabetes. Proceedings of the American Diabetes Association. 4:87, 1944.
- 2 Duran-Reynals, F.: The Ground Substance of the Mesenchyme and Hyaluronidase. Annals of the New York Academy of Sciences. 52:948, 1950.

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‡Antihyaluronidase (SC 4523) was supplied by Dr. Robert L. Craig of G. D. Searle and Company.