

The Effect of Oral Dextran on Blood Glucose

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DEXTRAN, a polysaccharide of high molecular weight, has shown some clinical usefulness as a blood substitute in the treatment of shock, and its metabolism after intravenous infusion has been the subject of considerable study. Little is known, however, of the influence of oral dextran on blood sugar levels. Bloom and Wilhelmi¹ fed this material to animal and human subjects and reported a slight but significant rise in blood sugar.

PROCEDURE

Five subjects were given 400 ml of 5 per cent dextran. Unlike the dextran for intravenous use (mol. wt. 75,000), this was an unhydrolyzed product with an average molecular weight of 16,000,000.† Four of the subjects were mild diabetics; none required insulin. These might well be expected to show an exaggerated response in blood sugar if dextran is absorbed and metabolized as glucose. The fifth subject (E) was a man with organic hyperinsulinism whose severe chronic hypoglycemia could be expected to respond to even minimal amounts of carbohydrate which might be derived from the dextran.

All tests were done after a 14-hour fast, except for the subject with hyperinsulinism who was tested after a three-hour fast. Blood sugars were drawn at 0, 1/2, 1, 2, and 3 hours. Determinations were done by the method of Somogyi, as modified by Nelson.

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RESULTS

The results are depicted in Table I. It can readily be seen that no significant increase in blood sugar occurred in any patient. None of the patients showed any untoward effects. The patient with hyperinsulinism and hypoglycemia displayed no beneficial clinical response to the ingested dextran.

TABLE I

Blood Sugar Values in mg/100 ml in Five Human Subjects after Ingestion of 20 Grams of Crude Dextran

Time	Subject*				
	A	B	C	D	E
Fasting	157	119	84	79	26
1/2 hour	162	129	89	80	28
1 hour	163	120	87	86	28
2 hours	146	112	83	81	25
3 hours	138	106	87	79	27

* A-D, diabetes; E, hyperinsulinism.

The results of this study indicate that unhydrolyzed high molecular weight dextran is not a readily available source of carbohydrate. Since the material is colorless, tasteless, and odorless and, when mixed with water, has the consistency of syrup, it might prove useful as a carbohydrate substitute, especially suitable as a vehicle for packing dietetic fruits for the diabetic.

REFERENCE

1. BLOOM, W. L., and WILHELMI, A. E. Dextran as a source of liver glycogen and blood reducing substance. *Proc. Soc. Exper. Biol. & Med.* 81: 501, 1952.

† The dextran used in this study was kindly supplied by Dr. Robert C. Hockett.