Liver Glycogen Response to Adrenal Cortical Extract of Diabetic and Non-Diabetic Rats.* (17523)

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This paper is a report of the liver glycogen response of alloxan-diabetic rats, following adrenalectomy, to adrenal cortical extract. It was of interest to determine to what extent liver glycogen could be increased by adrenal cortical hormones in the absence of an adequate insulin supply.

It has been previously reported(1-3) and confirmed in this paper (Table I), that the livers of alloxan-diabetic rats contain more glycogen than normal rat livers following a 24-hour fast. When fed(4-6) or comatose diabetic (2,7) animals have been used, a higher level of glycogen in the diabetic animal was not found. This difference in the liver glycogen levels of the fasted normal and diabetic animals did not complicate the experiment, however, since all animals were adrenalectomized 3 days prior to injection of adrenal cortical extract (ACE). The liver glycogen of the adrenalectomized diabetic rat (0.012 ± 0.002 mg/100 g liver) is of the same low order of magnitude as the adrenalectomized normal rat (0.016 ± 0.003 mg/100 g liver, Table II).

Experimental. Sprague-Dawley rats, male and female, weighing approximately 100 g (range, 80-110 g) were given alloxan (generally 130 mg/kg) subcutaneously following a 24 hour fast. For the following 24 hours, 5% glucose was substituted for drinking water. Nonfasting blood sugars were determined the following week by a modification of Folin's micromethod.(8) The animals were adrenalectomized 6-10 days later, and 3 days after adrenalectomy liver glycogen was determined by the method used by Dorfman *et al.*(9) Upjohn's lipo-adrenal extract (1 cc $\simeq$ 2 mg 11-dehydro-17-OH-corticosterone) was used. In the first experiment (Table II) this was diluted 1:1 with mazola oil. Following a 24 hour fast, each of the injected animals received 4 subcutaneous doses of ¼ cc at 2 hour intervals, and all animals were sacrificed 2 hours after the last injection. The animals were divided into 4 groups: (1) adrenalectomized, (2) adrenalectomized-diabetic, (3) adrenalectomized plus ACE, (4) adrenalectomized-diabetic plus ACE; the results are tabulated in Table II.

The results indicate that there is no statistically significant difference between the liver glycogen response to ACE of diabetic and non-diabetic rats following adrenalectomy. If the diabetic animal has reduced liver hexokinase activity or other defect causing reduced phosphorylation of sugar, it is possible that glycogen is formed largely from carbon fragments smaller than hexose; this is in agreement with the interpretation by Stetten(10) of the defects in alloxan diabetes.

Summary. Liver glycogen of alloxan-diabetic rats was 8 times as great as in normal rats. Both groups were fasted 24 hours. The liver

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TABLE I.
Liver Glycogen in Normal and Diabetic Rats (Fasted 24 Hr).

Status	No. of animals	Liver glycogen, mg/100 g liver	P	Blood sugar, mg% (mean and range)
Diabetic	11	.65 ± .14	<.01	658 (403-1100)
Normal	13	.08 ± .03		
Non-diabetic (received alloxan)	6	.14 ± .07	>.4	129 (120-143)

TABLE II.
Liver Glycogen Following Administration of Adrenal Cortical Extract to Diabetic and Non-diabetic Rats. (All animals adrenalectomized and fasted 32 hr).

Status	No. of animals	Treatment	Liver glycogen, mg/100 g liver	P	Blood sugar,† mg% (mean and range)
Diabetic	14	0	.012 ± .002	>.2	410 (264-620)
Non-diabetic	17	0	.016 ± .003		
Diabetic	7	ACE*	.44 ± .08	>.9	380 (280-645)
Non-diabetic	9	ACE*	.43 ± .10		
Diabetic	9	ACE	1.67 ± .16	>.2	397 (296-556)
Non-diabetic	10	ACE	1.97 ± .16		

* Diluted 1:1. † Prior to adrenalectomy.

glycogen response to adrenal cortical extract of diabetic rats was found not to be significantly different from the response of non-diabetic rats. Both groups were adrenalectomized and fasted 32 hours.

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Hemagglutination and Complement Fixation with Type I and II Albany Strains of Coxsackie Virus.* (17524)

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Dalldorf and Sickles(1) isolated a virus from the feces of patients having symptoms resembling those of abortive or even paralytic poliomyelitis. This active agent, characterized by pathogenicity for suckling but not for adult mice, was later named Coxsackie virus.(2) Melnick, Shaw, and Curnen(3) recovered several similar viruses some of which they found to be distinct by the neutralization test. Dalldorf(4) also determined such specificity for his strains, here designated as Type I and Type II Albany strains. The difficulties of working with infant mice are

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