

8434 P

Creatine Content of Hypertrophied Rabbits' Heart Muscle.*

GEORGE DECHERD, E. H. SCHWAB, GEORGE HERRMANN AND
W. O. BROWN.

From the Department of Medicine, University of Texas, Galveston.

In connection with studies on the mechanism of cardiac hypertrophy we have analyzed the muscle from 8 hearts of rabbits in which we have experimentally produced cardiac hypertrophy by section of aortic cusps. These animals were sacrificed 14 to 18 weeks after the valve incompetency had been produced. The hearts were divided and the muscle from each ventricle was analyzed for creatine by Myer's modification¹ of the method of Rose, Helmer and Chanutin. These values were reduced to terms of dried weight by drying one sample at 105°C. to a constant weight, thus determining the percentage of solids. The average normal creatine and total solids values for large rabbits such as were used in this series were 180 mg. % and 22.3%.

Eight rabbits with varying grades of hypertrophy from moderate to great degree showed creatine levels which were high in a few instances but dropped to normal and definitely low levels as the amount of hypertrophy increased. There is a slight drop in total solids, especially of the left ventricle muscle indicating a slight increase probably in intracellular fluid content.

In spite of the relatively lowered creatine concentration in the presence of great work hypertrophy the actual creatine content of

TABLE I.
Creatine of Hypertrophied Rabbit Heart Muscle.

HW/BW*	L/R†	—Lt. Vent.—		—Rt. Vent.—	
		Creatine	Solids	Creatine	Solids
			%		%
2.72	1.80	210	22.1	230	22.4
3.26	1.94	174	21.6	193	23.3
3.39	2.16	176	21.4	181	21.3
3.45	2.02	184	21.4	197	22.0
3.58	1.71	182	21.9	219	22.5
4.10	1.69	165	21.1	168	21.6
4.26	1.84	166	22.0	160	22.5
4.68	1.94	159	21.6	152	22.1
	Aver.	177	21.6	186	22.2

*HW/BW = Gm. of heart muscle per kilo of body weight.

†L/R = Ratio of left to right ventricular weight.

* Supported in part by Grant No. 349 from the Committee of Scientific Research of the American Medical Association.

¹ Seecof, D. P., Linegar, C. R., and Myers, V. C., *Arch. Int. Med.*, 1934, **53**, 574.

the individual heart was distinctly elevated. This type of cardiac hypertrophy is comparable to that of hypertension.

8435 P

Creatine Content of Digitalized Normal and Hypertrophied Rabbit Heart Muscle.*

GEORGE HERRMANN, GEORGE DECHERD, E. H. SCHWAB AND PETER ERHARD.

From the Department of Medicine, University of Texas, Galveston.

As a preliminary to a study of the effect of digitalization on the progress of experimental cardiac hypertrophy, we administered digalen and digifoline subcutaneously 0.1 C.U. semi-weekly to one series of 10 rabbits for 4 weeks and to 6 other rabbits for 14 to 18 weeks. These animals were then sacrificed and the hearts divided. Muscle from each ventricle was analyzed for creatine by Myer's modification¹ of the method of Rose, Helmar and Chanutin. These values were reduced to terms of dried weight by drying one sample at 105°C. to constant weight, then determining the percentage of solids.

Large rabbits such as were used in these and subsequent studies on hypertrophy, weighed 2200 to 3200 gm. and showed normal creatine values averaging 180 mg. % with solids averaging 22.3%.

Of the 10 rabbits digitalized for 4 weeks, 3 showed essentially normal creatine and total solids content, while the other 7 showed increased levels, as indicated in Table I. In the series in which digitalis injections were continued for 14 to 18 weeks the creatine percentages were slightly higher while the solids had dropped slightly. Simultaneous studies of the vastus lateralis in all of these rabbits revealed values normal for this muscle creatine (400 mg. %) and solids (24%). Thus the digitalis effect in so far as evidenced by the creatine changes is specific for heart muscle. The digitalization evidently produced no change in the heart weight-body weight or left to right ventricular ratios. The normal ratios are recorded in a preceding report.²

*Supported in part by Grant No. 349 from the Committee of Scientific Research of the American Medical Association.

¹ Seecof, D. P., Linegar, C. R., and Myers, V. C., *Arch. Int. Med.*, 1934, **53**, 574.

² Herrmann, G., Decherd, G., Erhard, P., and Schwab, E. H., *Proc. Soc. Exp. Biol. and Med.*, 1935, **33**, 409.