

The Coenzyme A Content of Ischemic Dog Myocardium. (17477)

WM. M. GOVIER AND ANNA J. GIBBONS (Introduced by M. H. Kuizenga)

From the Department of Pharmacology, The Upjohn Company, Kalamazoo, Mich.

We have previously reported the destruction of coenzyme I in dog myocardium rendered ischemic by ligation of the left anterior descending coronary artery. In similar experiments cocarboxylase was found unchanged after ischemia.¹ In the case of coenzyme I, the destruction described could be prevented by pretreatment with large doses of nicotinamide.

It may be considered that the occurrence of breakdown of a coenzyme under these conditions can suggest the likelihood of favorable results in treatment of coronary occlusion with large doses of the vitamin corresponding to the coenzyme concerned. On this basis it was thought of interest to determine whether or not coenzyme A is broken down in ischemic myocardium and whether the breakdown, if any, may be prevented by pantothenic acid administration.

Methods. The left anterior descending coronary artery was ligated in ten dogs by essentially the same technique reported previously. Ischemic and control myocardial samples were removed after 2 hours, boiled, homogenized, and analyzed for coenzyme A by the method of Kaplan and Lipmann.²

Four of the 10 dogs were pretreated with 50 mg/kg of sodium pantothenate intravenously 10 minutes before ligation of the vessel.

Results. The accompanying table shows in Kaplan-Lipmann units per gram dry muscle, the myocardial content of coenzyme A together with the percent change after 2 hours of ischemia. It is evident that breakdown of coenzyme A does occur, although by no means to the extent that coenzyme I is degraded, and that pantothenate does not significantly relieve the loss of coenzyme. This could suggest that the breakdown is not enzymically catalyzed, that heart muscle does not synthesize coenzyme A, or that pantothenic acid needs molecular rearrangement before being available for coenzyme A synthesis by myocardium.

Summary. Acute coronary artery ligation in the dog results in loss of coenzyme A in the infarcted myocardial area. Pretreatment with pantothenic acid does not influence this loss.

Received October 25, 1949. P.S.E.B.M., 1949, **72**.

TABLE I.
Myocardial Coenzyme A Content in Lipmann Units/G Dry Wt.

Not pretreated				Pretreated			
Dog	Normal	Ischemic	% change	Dog	Normal	Ischemic	% change
A	166	53	-68	G	227	111	-53
B	173	106	-39	H	184	162	-12
C	204	155	-24	J	168	143	-15
D	166	145	-13	K	125	107	-14
E	176	155	-12				
F	145	90	-38				

¹ Govier, Wm. M., *Am. Heart J.*, 1945, **29**, 384.

² Kaplan, Nathan O., and Lipmann, Fritz, *J. Biol. Chem.*, 1948, **174**, 37.