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Effect of Heparin on Acute Anaphylactic Shock.

JAMES D. BRADLEY AND CARL A. DRAGSTEDT.

From the Department of Physiology and Pharmacology, Northwestern University Medical School

Kyes and Strauser[1] studied the effect of heparin on acute anaphylactic shock in the pigeon and concluded that heparin as a reagent inhibiting fibrin formation so markedly eliminates anaphylactic shock reactions as to give support to the view that there is a causal relation between fibrin emboli and the symptoms of shock. There are conflicting reports on the effect of heparin on anaphylactic shock in the guinea pig, Williams and Van de Carr[2] reporting that heparin prevents or reduces the shock symptoms while neither Reed and Lamson[3] nor Hyde[4] found any such protection. So far as we are aware, similar experiments have not been performed on the dog. Dogs were sensitized to horse serum. After varying intervals of time, the dogs were anesthetized with ether, the femoral vein exposed for injections and the carotid artery cannulated for recording blood pressure. Heparin in saline was then injected intravenously and after varying time intervals, the critical dose of serum was injected. The details of the experiments and the results appear in Table I.

In 59 control experiments in which the amounts of the sensitizing and shocking doses and the time intervals are fairly approximate to those here reported, the distribution of the varying grades of severity of shock were as follows: ++++ 28%, +++ 13%, ++ 48%, + 8%, and 0 3%. In the heparin series, the corresponding ratios are ++++ 6%, +++ 18%, ++ 64%, + 6%, and 0 6%. We do not believe that the difference between the 2 series is significant. Certainly there is not the marked modifying influence of heparin reported by Kyes and Strauser in the case of the pigeon or by Van de Carr and Williams in the case of the guinea pig. Consequently we conclude that these experiments lend no support to the theory that the formation of fibrin emboli condition the symptoms of anaphylactic shock in the dog.

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[1] Kyes, Preston and Strauser, *J. Immun.*, 1926, **12**, 419.

[2] Williams and Van de Carr, PROC. SOC. EXP. BIOL. AND MED., 1927, **27**, 798, Van de Carr and Williams, *J. Immun.*, 1928, **15**, 13.

[3] Reed and Lamson, *J. Immun.*, 1927, **13**, 433.

[4] Hyde, *Am. J. Hygiene*, 1927, **7**, 614.

TABLE I.

Effect of Heparin on Acute Anaphylactic Shock in the Dog.

Exp. No.	Wt. Kilos	Sensitizing Dose		Interval Days	Shock Dose cc.	Heparin in mg. per kilo	Time between Heparin and Shock, min.	Time Onset Shock Seconds	Degree Shock
		Intraven. cc.	Subcu. cc.						
41	17	4.5	—	24	10	10	8	90	++*
68	13.6	13	5	97	13.6	15	15	90	+++
69	19	10	—	15	19	10	4	90	++
70	19	10	—	15	19	10	4	30	++++
71	12.3	10	—	15	12.3	10	6	50	++
72	7.7	10	—	15	8	10	9	35	+++
73	11	10	—	15	11	10	6	?	+
74	19	10	—	15	19	10	5	38	++
75	18	10	—	15	20	10	6	32	+++
76	10	5	5	13	10	10	8	—	O
77	10	5	5	13	10	10	8	32	++
81	17.2	5	5	20	10	10	35	45	++
82	8.2	5	5	26	2.2	10	20	55	++
83	8.5	5	5	27	4	10	15	60	++
84	15	5	5	15	7.5	10	18	30	++
85	12.3	5	5	15	6.2	10	10	35	++

* Method of grading shock.

O = no recognizable shock symptoms.

\+ = Insignificant fall in blood pressure. Contraction of urinary bladder or other evidences of shock present.

++ = Moderate to marked fall in blood pressure, with partial or complete recovery in 20 minutes.

+++ = Marked fall in blood pressure. No recovery in 30 minutes.

++++ = Death in less than 30 minutes.