

Hepatic Blood Flow in Chronically Splenectomized Dogs. (27131)

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It has been observed that the spleen becomes engorged with blood during pentobarbital induced anesthesia(1,2). For this reason it has been suggested that the presence of an intact spleen accounts for much of the variation in estimating hepatic blood flow (3). Though Hallet *et al.*(3) were unable to demonstrate any consistent change in estimated hepatic blood flow (bromsulphalein) as a result of splenectomy, calculations made from their raw data suggest a decrease in the variability of flow estimated after splenectomy. It has also been shown, however, that the variability of hepatic blood flow estimated by the bromsulphalein method is less in anesthetized dogs than in unanesthetized animals, and that pentobarbital induced anesthesia has little or no effect on hepatic blood flow (4,5). The present report consists of observations made on 22 splenectomized dogs anesthetized with pentobarbital and compared with those obtained on anesthetized and unanesthetized intact dogs in previous studies (5,6,7,8).

Methods. Twenty-two splenectomized dogs, ranging in weight from 12.7 to 27.6 kg. were anesthetized with sodium pentobarbital (30 mg/kg). These animals had been splenectomized 1-24 months before these observations were made and had fully recovered from the operation. Procedures and technics employed for estimation of hepatic blood flow using bromsulphalein, as well as methods of calculation for the various metabolic and hemodynamic parameters, have been previously described(6,9). The statistical comparison was made using the standard "t" test for independent samples. All of the groups compared consisted of adult mongrel dogs used for these studies over a period of several years.

Results and discussion. Mean and stand-

ard errors of the various parameters measured in this study are presented in Table I. No changes in hepatic blood flow could be attributed to the duration of splenectomy. In Table II mean estimated blood flow is compared statistically with data of anesthetized and unanesthetized intact dogs previously reported by one of us(5,9). The "t" value was obtained between the group of splenectomized dogs and the other groups, and level of probability was found using the number of observations as the value for "n" rather than the number of animals. The lower standard error noted in 2 of the anesthetized groups could be explained by the fact that several of the animals were studied more than once. No statistically significant alteration in flow was noted.

The finding that pentobarbital anesthesia does not alter hepatic blood flow significantly (4,5) suggests that the increase in splenic volume consequent to pentobarbital administration(1) does not influence hepatic blood flow. The results obtained in the present study suggest that splenectomy *per se* does not alter hepatic blood flow estimated by the bromsulphalein method. Though an intact spleen may contribute to the variability of the results obtained by this method, its influence on the level of blood flow is insignifi-

TABLE I. Estimated Hepatic Blood Flow and Other Hemodynamic and Metabolic Parameters Observed in a Group of 22 Splenectomized Dogs.

	Mean	S.E.
Estimated hepatic blood flow, ml/min.	615	48
Oxygen consumption, ml/min.	92.4	5.4
Arterial oxygen content, vol %	17.8	.36
Splanchnic oxygen consumption ml/min.	28.1	7.2
% of total	32.0	3.1
Heart rate, beats/min.	122	6.2
Mean arterial blood pressure, mm Hg	127	4.9
Mean hepatic vein pressure, mm Hg	2.8	.7
Splanchnic vascular resistance, units*	.20	.01

* Pressure difference/flow.

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TABLE II. Statistical Comparison of Mean Estimated Hepatic Blood Flow of a Group of 22 Splenectomized Dogs with Means of Groups of Anesthetized and Unanesthetized Intact Dogs Previously Reported by One of Us.

	Intact				Splenecto- mized
Anesthetized	No	Yes	Yes	Yes	Yes
No. animals	11	17	14	14	22
No. observations	11	49	49	41	22
Mean flow, ml/min.	633	690	649	650	615
S. E.	44	52	25	28	48
"t"	.28	1.09	.63	.63	
p*	>.70	>.30	>.50	>.50	
Reference No.	5	6	7	8	

* Based on No. of observations.

cant, and as a potential source of error(3) is less important than those induced by other factors(10).

Summary. Hepatic blood flow of chronically splenectomized dogs estimated by the bromsulphalein method was found not to be significantly different than that found in normal intact anesthetized and unanesthetized dogs.

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Renal Tubular Transport of Some Nitro and Amino Hippuric Acids.* (27132)

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Meta and *para* nitrohippuric acids are poorly transported by the renal tubule as judged by low accumulation of these substances in slices of rabbit renal cortex *in vitro*(1). Such a conclusion is not consistent with our observations with *m*-nitrohippuric acid and *p*-nitrobenzoysarcosine both of which showed effective excretory transport in the dog kidney(2,3). Further examina-

tion of the excretion of these nitro compounds in comparison with the excretion of corresponding amino compounds was made, with particular attention to urinary pH.

Experimental. The acid dissociation constants, as taken from the literature or measured by potentiometric titration, are shown in Table I. The partition coefficients were determined by equilibrating solutions of the compounds in N/10 HCl with tributyrin. The values for the amino compounds are somewhat ambiguous, since some protonation of the amino groups might be expected at this pH, leading to ionization and reduction of

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