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Arterial Pressures in Street Dogs: Incidence and Significance of Hypertension. (20564)

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Spontaneous hypertension in dogs might more closely resemble the "essential" hypertension of human beings than experimental neurogenic or nephrogenic hypertension. The condition has been described (Stamler, Katz, Rodbard(1)), but authorities(2) disagree as to its incidence and significance and agree only that it occurs infrequently. The present report is based on arterial pressure measurements in 400 dogs selected at random, most of them adult mongrels.

Methods. Pressures were measured in a sound-proofed room while the dogs were gently restrained on their backs. The femoral artery was punctured with a 20 g needle connected to a mercury manometer by rigid tubing filled with 5% citrate solution. Except as noted below, only one measurement was made and this usually within a few days after the dogs had been received; thus the data do not reflect the effect of training. The one observer was skilled, so that few dogs resisted the procedure and most lay quietly after a few minutes of petting. Measurements were continued until the pressure reached what seemed a minimum level; this usually required only 4 or 5 minutes but was sometimes prolonged up to 15 or 20 minutes.

Results are summarized in Table I. Arterial pressures of most of the animals (319/400) were in the range 111-140 mm Hg. Some ranged from 141 to 150 mm Hg and a few

between 99 and 111 mm Hg. Only 9 (2% of the group) could be considered hypertensive, *i.e.*, if one accepts the arbitrary definition of an arterial pressure higher than 150 mm Hg. The arterial pressures of 7 of these 9 ranged between 150 and 157 mm Hg at the first determination and fell below this level when measurements were repeated on succeeding days and "training" established. Only 2 of the 400 showed appreciable hypertension with arterial pressures of 175 and 205 mm Hg which persisted at these respective levels with repeated testing over several weeks.

Since these two might be considered examples of spontaneous hypertension, they were studied more closely. One, dog A, was old; at postmortem, its kidneys were contracted and had the gross appearance of chronic pyelonephritis; the renal pelves of dog B were found at postmortem to contain stones and sections of the kidney demonstrated nephrosclerosis on microscopic examination. Respective renal plasma clearances of p-aminohippurate were 8.3 and 8.7 cc per kg body weight per minute and the simultaneous plasma clearances of exogenous creatinine 2.7 and 2.8. These clearance rates are lower than the means of 13.5 (effective renal plasma flow) and 4.3 (glomerular filtration rate) found in normal dogs (Houck(3)).

Previous evidence for the occurrence of spontaneous hypertension is mainly the rela-

TABLE I. Range of Arterial Pressure in 400 Street Dogs.

Mean systolic pressure in mm Hg	100-110	111-120	121-130	131-140	141-150	151-156	175	205
No. of dogs	19	82	123	114	53	7	1	1

tively normal renal clearances of 3 dogs with sustained elevation of arterial pressure studied by Stamler, Katz and Rodbard(1); the clearance rates of one of these were 10.2 (effective renal plasma flow) and 3.5 (glomerular filtration rate) cc per kg per minute. No data are available as to the appearance of the kidneys of this animal; however, the kidneys of the other two, whose renal plasma clearances were somewhat more depressed below mean normal did show "slight to moderate chronic focal lesions". Thus, renal plasma clearances while within the range of normal have been found to lie below the normal mean in 5 dogs with seeming spontaneous hypertension; 4 of these for which data are available demonstrated renal lesions at autopsy.

Focal lesions, such as occur in some dogs with experimental renal hypertension, do not necessarily depress plasma clearances (Corcoran and Page(4)) so that normal rates of plasma clearance are observed in some dogs with experimental renal hypertension(1,4). Demonstration of normal or slightly sub-normal rates of plasma clearance in dogs found to be hypertensive does not therefore establish that the hypertension is of extrarenal origin. Actually, focal or diffuse renal lesions are not uncommon in dogs (Bloom(5)), and

it would be surprising if these did not sometimes elicit renal hypertension. Hamilton *et al.*(6) observed that dogs with hyalinized arterioles and with glomerular nephritis have higher pressures than the average population.

Summary. Hypertension resembling "clinical essential" hypertension may occur in dogs, but the weight of the evidence inclines us to the view that this condition must be very rare; what seems to be "spontaneous" canine hypertension is usually attributable to renal disease. The relatively narrow spread of arterial pressures in this series of street dogs indicates that the skill of the observer is at least as important as the training of the dog.

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Action of 3-Acetyl-Strophanthidin in Isolated Mammalian Heart.* (20565)

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An ester of strophanthidin, 3-acetyl-strophanthidin, has been found to be effective for slowing ventricular rate in auricular fibrillation and for treating paroxysmal tachycardia. After intravenous administration, the onset of

action is rapid and the duration of effect is relatively short(1). However, the positive inotropic action of 3-acetyl-strophanthidin has been questioned by Wedd and Blair(2) who found marked differences in the response of the turtle heart to digitalis and to 3-acetyl-strophanthidin. From their results, the authors concluded that this ester cannot be an

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