An inverse relationship between the pressor response to noradrenaline and the resting blood pressure

SIR,—In rats under pentobarbitone anaesthesia (45 mg/kg, i.p.), in which initial and final mean arterial pressures have differed by less than 10 mm Hg; the pressor response to noradrenaline is inversely related to the resting blood pressure. Fig. 1 makes a comparison of responses to 20 and 200 ng noradrenaline, intravenously in two groups of rats, A and B, weighing 180–220 g, in which group A had a resting mean arterial pressure of 161·0 ± 2·7 and group B 143·0 ± 1·1 mm Hg. As can be seen from Fig. 1, the pressor response elicited by noradrenaline was greater for the group of rats with the lower resting arterial blood pressure at both the low ($P < 0.01$) and high ($P < 0.001$) dose levels. In these experiments the mean of three responses from each rat to each dose has been used and order of dose administration has been determined by randomization.

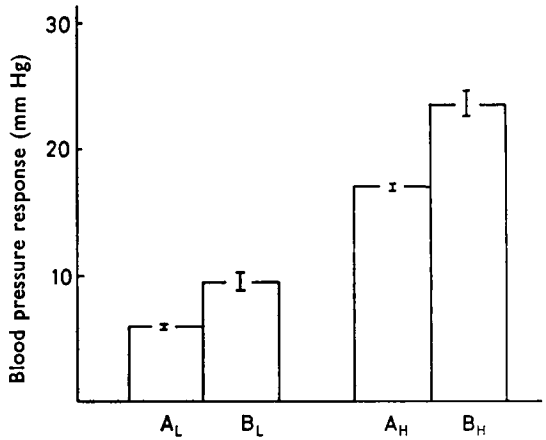

FIG. 1. The mean ± s.e. of the pressor response of two groups of rats (A and B) to a low dose (L=20 ng) and a high dose (H=200 ng) of noradrenaline i.v. The mean resting arterial blood pressure of group A (17 rats) was 161·0 ± 2·7 (mean ± s.e.) while that of group B (31 rats) was 143·0 ± 1·1 mm.

The maximum response to noradrenaline obtainable from these preparations is at least 60 mm Hg, and linearity of the log-dose effect curve theoretically extends from responses of 12 to 48 mm Hg. Since the rise in arterial pressure caused by the low dose of noradrenaline in group A was only 5·98 ± 0·13 mm Hg, this effect fell outside the linear range. Hence the apparent difference between the slopes of the log-dose effect curves for group A and B (Fig. 1) is an artifact.

There is also a similar relationship between the pressor effect of a fixed dose of angiotensin and the resting mean arterial pressure. Therefore this inverse relationship may hold for all pressor agents. Caution should then be exercised when comparing pressor responses of groups of anaesthetized animals with different resting blood pressures.

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