

References

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Pressor responses to noradrenaline administered into the third cerebral ventricle of anaesthetized and conscious cats

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Administration of noradrenaline into a lateral cerebral ventricle has been reported to cause falls in blood pressure in both anaesthetized (Nashold, Mannarino & Wunderlich, 1962) and conscious (Day & Roach, 1974) cats. However, pressor responses have been observed after noradrenaline administration into the third ventricle (Phillippu, Przuntek, Heyd & Burger, 1971) and after the administration of low doses of noradrenaline into the lateral ventricles of anaesthetized cats (Gagnon & Melville, 1966).

In the present study we have infused noradrenaline into the third ventricle of both anaesthetized and conscious cats and have recorded the effects on blood pressure and heart rate. Blood pressure was recorded from a femoral artery in anaesthetized (chloralose 70 mg/kg i.v.) animals and from an indwelling carotid catheter in conscious animals. Heart rate was obtained from the blood pressure pulse. In both series of experiments cannulae were inserted stereotactically into the third ventricle.

The administration of noradrenaline (15 and 30 µg) into the third ventricle of 12 anaesthetized cats produced mean (\pm s.e. mean) pressor responses of 56.0 ± 13.4 and 80.3 ± 12.4 mmHg systolic and 42.0 ± 11.8 and 56.9 ± 9.0 mmHg diastolic, respectively, with a variable effect on heart rate. The duration of the pressor response was usually 10 to 20 minutes. In seven experiments spinal section at C-2 was performed and in five of these the response to noradrenaline was significantly ($P < 0.05$) reduced,

whilst in the remaining two a potentiation was seen. In 6 cats bilateral adrenalectomy significantly ($P < 0.05$) reduced the pressor response to noradrenaline administered into the third ventricle whilst in three other cats the response was potentiated. Responses to systemic noradrenaline (0.25 to 1 µg/kg i.v.) were not affected by either adrenalectomy or spinal section.

In conscious cats lower doses of noradrenaline (1.65 to 10 µg) produced pressor responses when infused into the third ventricle. These responses were usually associated with tachycardia, and both pressor and heart rate responses were markedly reduced after hexamethonium (1 to 10 mg/kg i.v.) indicating that they were of central origin. Propranolol (0.5 to 1 mg) infused into the third ventricle of 4 cats reduced by approximately 60% the pressor response and tachycardia to noradrenaline administered by the same route. Phentolamine (0.5 mg) infused into the third ventricle of 3 cats reduced the noradrenaline pressor response by approximately 45%.

The results suggest that noradrenaline administered into the third cerebral ventricle of cats can produce a centrally-mediated pressor response which is apparently the result of stimulation of both α and β adrenoceptors and which in some cats is partly due to central activation of the adrenal medulla.

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