barostatic mechanisms and depression by the drug of bulbar efferent sympathetic tone (Schmitt, Schmitt, Boissier & Giudicelli, 1967) and peripheral adrenergic nerve function (Boura, 1975). Present results suggest that the point of this equilibrium can be specifically affected by tissue levels of 5-hydroxytryptamine. That this effect was mediated by a peripheral mechanism was suggested by the action of carbidopa, a selective inhibitor of peripheral L-aromatic amino acid decarboxylase (Bartholini & Pletscher, 1969) but the abolition of the inhibitory effect by pithing indicated that the central nervous system may also be involved.

This work was partly supported by a grant from The Wellcome Foundation Limited.

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Responses of the hepatic arterial vascular bed of the dog to intra-arterial injections of noradrenaline, adrenaline and phenylephrine: the role of β-adrenoceptors

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In the sympathetically-denervated hepatic arterial vascular bed of the dog, intra-arterial (i.a.) injections of noradrenaline cause dose-dependent hepatic arterial vasoconstriction (Richardson & Withrington, 1976a). Whilst previous reports have suggested that the effect of adrenaline on this vascular bed is essentially vasoconstrictor (see Greenway & Stark, 1971), isoprenaline injected i.a. causes dose-dependent hepatic arterial vasodilatation, due to stimulation of β_2-adrenoceptors (Richardson & Withrington, 1976b). The contribution of β-adrenoceptor stimulation to the effects of the catecholamines has therefore been examined in the sympathetically-innervated hepatic arterial vasculature.

The hepatic arterial vascular beds of 15 chloralose-urethane anaesthetized dogs (13.1 ± 2.2: mean $\pm$ s.d. kg) were perfused as described by Richardson & Withrington (1976c): under control conditions, the hepatic arterial perfusion pressure was 117.7 ± 15.4 (s.d.) mmHg and the hepatic arterial blood flow 210.7 ± 56.9 ml/min. The calculated hepatic arterial vascular resistance (HAVR) was 1.80 ± 0.76 mmHg ml^{-1} min 100 g, the livers weighing 301.6 ± 50.1 grams.

When noradrenaline was injected i.a., there was an immediate dose-dependent increase in the calculated HAVR at doses above 5 ng, with a maximum rise in HAVR of $308.5 \pm 81.1\%$ (mean $\pm$ s.e. mean; $n=10$) occurring between 50 and 200 µg. In addition, over the dose range 50 ng–10 µg in most experiments, there followed a secondary reduction in HAVR which reached a maximum of $17.2 \pm 3.4\%$ and had a time course similar to that of i.a. injections of isoprenaline (see Richardson & Withrington, 1976c).

The responses to i.a. adrenaline were similar to those of noradrenaline, with dose-dependent rises in HAVR at doses above the threshold (5–100 ng) reaching a maximum of $504.5 \pm 79.8\%$ ($n=11$) at 50–200 µg. These were followed by vasodilatation at doses between 50 ng and 50 µg reaching a maximum of $21.7 \pm 3.3\%$. In all experiments where both catecholamines were administered, noradrenaline was on a molar basis a more potent vasoconstrictor than adrenaline.

Phenylephrine caused dose-dependent rises in HAVR above the threshold of 1 µg i.a., reaching a maximum of $412.9 \pm 87.2\%$ ($n=4$) at 50–200 µg, but in contrast to noradrenaline and adrenaline, there was no secondary reduction in HAVR.

In 3 experiments, propranolol (0.25 mg kg^{-1}, i.v.) markedly attenuated the secondary dilatation due to i.a. noradrenaline and adrenaline. In addition, both catecholamines were more potent hepatic arterial vasoconstrictors; the increase in vasoconstrictor potency of adrenaline, but not of noradrenaline, being statistically significant (Paired t-test; $P<0.02$). The mean dose of adrenaline which doubled the HAVR

before propranolol was 1.7×10^{-8} mol, and after propranolol 1.8×10^{-9} mol (for noradrenaline: 3.9×10^{-9} and 2.6×10^{-9} mol respectively).

The vasoconstrictor potency of phenylephrine was unaffected by propranolol.

Whilst the predominant effects of noradrenaline and adrenaline on the hepatic arterial vasculature are vasoconstrictor, a secondary vasodilatation occurs with these catecholamines, but not with phenylephrine. The potentiation of the vasoconstriction and attenuation of the secondary vasodilatation due to the catecholamines by propranolol illustrates the role of β-adrenoceptor stimulation in the responses of this vascular bed to i.a. catecholamines.

We thank the Medical Research Council for financial support.

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Turning behaviour elicited by apomorphine, (+)-amphetamine and three ergot derivatives in rats treated with a unilateral injection of ethanolamine-*O*-sulphate in the substantia nigra

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Recently, Dray, Oakley & Simmonds (1975) have reported that apomorphine and (+)-amphetamine elicit ipsilateral turning in rats which have received a unilateral injection of ethanolamine-*O*-sulphate (EOS) into the substantia nigra. After EOS injection, these animals showed an elevation of GABA concentration in the substantia nigra brought about by an inhibition of GABA transaminase (Fowler, 1973). This may correspond to an activation of an inhibitory GABA-minergic pathway from the striatum to the dopamine containing neurons of the zona reticulata of the substantia nigra (McGeer, McGeer, Wada & Jung, 1971; Kim, Bak, Hassler & Okada, 1971). We wish to report on the effects of three ergot derivatives which have been shown to elicit contralateral turning in rats with a unilateral degeneration of the nigro-striatal pathways after administration of 6-hydroxydopamine into the substantia nigra.

Under nembutal anaesthesia, male OFA rats (250 g) received unilateral injections of EOS (50 µg in 1.5 µl) stereotaxically directed into the zona reticulata of the substantia nigra. Drugs were administered s.c., 24 h after EOS, 6 rats per group. Behaviour was assessed during the following 7 hours. Injection sites were confirmed histologically.

As reported by Dray, Oakley & Simmonds (1975), apomorphine and (+)-amphetamine (1–4 mg/kg) both elicited ipsilateral turning. After 4 mg/kg, the total number of turns was 513 ± 87 and 852 ± 111, respectively. In contrast to the results of Dray, Fowler, Oakley, Simmonds & Tanner (1975), bromocriptine (10 or 50 mg/kg) elicited ipsilateral postural asymmetry and stereotyped sniffing. Ipsilateral turning was only observed upon handling. The ergoline derivative CF 25–397 (Jaton, Loew & Vigouret, 1976) induced only contralateral asymmetry at doses of 20 to 50 mg/kg. LSD–25 (1 or 4 mg/kg) induced typical contralateral turning. After 4 mg/kg, the total number of turns was 210 ± 49.

These results indicate that the three ergot derivatives investigated exert differential actions in EOS treated rats. As opposed to apomorphine and (+)-amphetamine, LSD–25 was the only compound which elicited contralateral turning after unilateral inhibition of GABA metabolism.

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