accompanied by changes in 5HT. Administration of valofan (500 mg/kg ip) to mice produced a transient increase in whole brain tryptophan ($P < 0.05$) 0.5 h following dosing, but otherwise did not alter whole brain levels of 5HT, 5HIAA or tryptophan in the subsequent 24 h period.

Incorporation of valofan ($10^{-8} - 10^{-4}$ M) into *in vivo* dopamine (10^{-4} M) stimulated striatal adenylate cyclase preparations failed to alter the dopamine stimulation. Similarly, valofan ($10^{-9} - 5 \times 10^{-6}$ M) failed to inhibit specific binding of [^{3}H]-spiperone (0.5 nM; 21 Ci/mmole) to striatal preparations as judged using (+)-butaclamol (5×10^{-6} M) as displacing agent.

This data suggests an effect of valofan on cerebral dopamine function not associated with a direct receptor action. The alterations in dopamine turnover are compatible with reduced transmitter release reminiscent of that caused by cessation of impulse flow following administration of γ-butyrolactone.

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Superior colliculus lesions do not alter dopamine mediated circling behaviour

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The efferent pathways responsible for circling behaviour produced by apomorphine in rats with unilateral 6-hydroxydopamine lesions of the nigro-striatal pathway are unknown. Recent data has indicated that the zona reticulata of the substantia nigra gives rise to a major nondopaminergic outflow pathway from the basal ganglia (Olianas, De Montis, Concu, Tagliamonte & Di Chara, 1978). This pathway appears to mediate behavioural responses induced by changes in striatal dopamine function. A major target area for substantia nigra efferents is the superior colliculus (Graybiel & Sciascia, 1975) and it is possible that a nigro-tecto-spinal tract may be involved in the mediation of turning behaviour. Using lesioning techniques we have investigated this possibility in the rat.

Unilateral electrolytic ablation of the posterior and rostral superior colliculus (A 1.0; L 0.9; V + 0.4: A 1.8; L 0.9; V + 0.3) according to De Groot (1959) induced transient spontaneous slow ipsiversive rotation in wide circles (rate of circling 2.1 ± 0.3 rotations per min on day 8 following surgery). The rotation was not enhanced by the administration of amphetamine sulphate (5 mg/kg ip; 30 min previously) or apomorphine hydrochloride (0.5 mg/kg sc; 15 min previously).

Animals with unilateral 6-hydroxydopamine (8 μg/3 μl saline 0.9%) lesions of the medial forebrain bundle (MFB) at the level of the lateral hypothalamus (A 4.6; L 1.9; V − 3.0) showed tight contraversive circling to apomorphine (15.5 ± 5.3 rotations per min) and ipsiversive turning to amphetamine (8.5 ± 0.6 rotations per min) 19 days following surgery. Subsequent bilateral electrolytic lesioning of the superior colliculus did not alter the circling induced by these drugs.

6-Hydroxydopamine lesioning of the MFB at the level of the left lateral hypothalamus and right rostral hypothalamus (A 6.6; L 2.3; V 1.7) produced animals showing marked rotation towards the intact striatum in response to apomorphine (20.7 ± 4.4 rotations per min) but only slight rotation towards the denervated striatum in response to amphetamine (1.7 ± 0.8 rotations per min) 19 days following surgery. Subsequent electrolytic lesioning of the left superior colliculus failed to alter the rotational response to these drugs. Thus, confirming the lack of collicular involvement.

Other animals having a unilateral 6-hydroxydopamine lesion of the MFB at the level of the lateral hypothalamus (rotation to apomorphine and amphetamine 23.8 ± 1.8 and 14.0 ± 2.8 rotations per min respectively, 27 days following surgery) subsequently received an electrolytic lesion of the dorsal tegmental decussation (A 1.4; L 0.0; V − 3.3). This lesion failed to attenuate amphetamine-induced circling although it did cause a 45% reduced apomorphine-induced rotation ($P < 0.025$).

It is concluded that the nigro-tectal tract does not play a role in circling induced by striatal dopamine receptor imbalance but that fibres passing close to

the dorsal tegmental decussation may be involved in this behavioural response.

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Comparison of the central nervous system actions of taurine and N-pivaloyltaurine

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Biochemical and neurophysiological evidence suggests that taurine functions as an inhibitory neurotransmitter in the central nervous system (Oja & Lähdesmäki, 1974). Taurine is also known to depress motor behaviour and alter cerebral dopamine metabolism (Garcia de Yebenes Prous, Carlsson & Mena Gomez, 1978). Its behavioural and other central nervous system effects are, however, difficult to study, because it only slowly penetrates the blood-brain barrier. This problem could be solved by developing a pro-drug from taurine, i.e. a more lipid soluble derivative which would be converted back to taurine in the brain. For this purpose N-acetyl-, N-propionyl- and N-pivaloyltaurine were synthetized and their actions compared to those of taurine. The derivatives were prepared by applying a modified Schotten-Baumann's method starting from taurine and using a corresponding acid chloride for direct acylation reactions.

Taurine and the derivatives were administered i.p. to white mice weighing 27–31 g. The tests used were: (1) Modification of sleeping time induced by pentobarbitone sodium (40 mg/kg i.v.). (2) Measurement of locomotor activity in Animex Activity Meter at 10 min intervals for 3 h. (3) Modification of morphine (3 mg/kg, s.c.) -induced antinociception (hot plate method). (4) Measurement of cerebral dopamine (DA) concentration in control and α-methyl-*p*-tyrosine (α*M*p*T*; 250 mg/kg, 1 h) -treated mice. Tests 1, 2 and 4 were done in the morning (08–13 h), test 3 in the afternoon (13–16 h).

Taurine (1–10 mmol/kg), N-acetyltaurine (3 mmol/kg) and N-propionyltaurine (0.3–3 mmol/kg) did not significantly lengthen the pentobarbitone sleeping time in the forenoon but N-pivaloyltaurine (0.3–3 mmol/kg) increased it by about 30% ($P < 0.05$); all doses causing about similar increases. Because of the inactivity of N-acetyl- and N-propionyltaurine in this test, their effects were not further studied. Taurine decreased the spontaneous activity of mice during the first 10 min after its administration by 35% (3 mmol/kg; $P < 0.05$) and 44% (10 mmol/kg; $P < 0.001$), but not at any later time point studied. On the other hand, N-pivaloyltaurine (1 mmol/kg) did not alter the activity of mice during the first 10 min after its administration, but reduced it by 40–50% ($P < 0.05$–0.01) at 10–60 min after administration. Taurine (6 mmol/kg) and N-pivaloyltaurine (1 mmol/kg) slightly antagonized the antinociceptive affect of morphine in the hot plate method. N-pivaloyltaurine (10 mmol/kg) increased the brain DA concentration in α*M*p*T*-treated mice (from 0.67 ± 0.02 μg/g to 0.84 ± 0.05 μ/g; mean ± s.e. mean, $n = 4$, $P < 0.02$), and tended to increase it in the control mice, too. Taurine (10 mmol/kg) did not cause any changes in cerebral DA concentration.

Our results suggest that N-pivaloyltaurine penetrates to the brain and is there converted into taurine. Thus N-pivaloyltaurine could be used to study the behavioural and other central nervous system actions of taurine.

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