pempidine to block ADH release by osmotic stimulation suggests that this stimulus may not involve a cholinergic link. The increase in circulating ADH following pempidine may be due to blockade of inhibitory pathways.

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The effect of *p*-methoxyphenylethylamine (PMPEA) on monosynaptic reflexes in the cat

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The actions of PMPEA and several blocking agents were studied in cats anaesthetized with chloralose. Flexor (posterior biceps, semitendinosus, PBST) and extensor (gastrocnemius, soleus, GS) monosynaptic reflexes were recorded from peripheral nerves of the cat hindlimb in response to stimulation of dorsal roots of the lumbosacral enlargement. The L_6–S_1 dorsal roots were sectioned bilaterally, and the spinal cord was transected at L_1. Monosynaptic reflex spikes were integrated electronically. The integrals were displayed, along with a record of the arterial blood pressure, on a pen-recorder. The drugs used included, in addition to PMPEA, phenoxybenzamine, methysergide and pronethalol; administration was intravenous.

PMPEA (5 mg/kg) increased the monosynaptic reflexes of both flexor and extensor motoneurones. The potentiation did not exhibit tachyphylaxis to repeated doses of the compound. The effect of pretreatment with phenoxybenzamine (20 mg/kg), methysergide (2 mg/kg) or pronethalol (5 mg/kg) was investigated. Pretreatment with either phenoxybenzamine or methysergide reduced the response to PMPEA. The presence of both phenoxybenzamine and methysergide produced almost complete block of the PMPEA response. Pretreatment with pronethalol had little effect.

The possibility that 5-hydroxytryptamine and noradrenaline have excitatory effects on monosynaptic reflexes in the cat cord has been postulated (Baker & Anderson, 1965; Anderson & Shibuya, 1966). These authors demonstrated that pretreatment with 5-hydroxytryptophan, L-tryptophan or 1-3,4,dihydroxyphenylalanine increased the size of the monosynaptic reflex recorded from the cat cord. The site of action of PMPEA may be on 5-hydroxytryptamine and/or catecholamine receptors in the spinal cord, although the possibility of release of monoamines within the spinal cord requires further investigation.

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Neuropharmacological effects of cystathionine and cysteine in cats

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The concentration of cystathionine in the brain and cerebrospinal fluid varies greatly in certain clinical conditions in which other sulphur-containing amino-acids are found in normal amounts (Berlow, 1967). There is much speculation regarding the significance of this amino-acid in the brain, so L-cystathionine HCl and its metabolic derivatives cysteine, homoserine and alpha-ketobutyric acid were administered into the left cerebral ventricle of cats to ascertain whether they produce any specific electroencephalograph (e.e.g.) and behavioural changes.

Acute experiments were performed on nine *encéphale isolé* preparations. Each of these animals was given the different amino-acids and control injections of solutions of HCl of equivalent pH and the saline vehicle. Chronic experiments were performed on two cats with implanted intraventricular cannulae and cortical recording electrodes.

In the *encéphale isolé* preparation, 2 mg of cystathionine produced an e.e.g. synchrony; whereas, 1 mg of cysteine caused an e.e.g. activation lasting about 5 min, which was accompanied in most animals by overt signs of intense alerting. In addition, cystathionine, given 2 min before, inhibited or blocked the e.e.g. activation normally induced by cysteine. Thus, solutions of these two amino-acids, which have a similar pH (1·9–2·0), produced diametrically opposite effects. Different doses in the range 1–10 mg of homoserine and alpha-ketobutyric acid failed to produce these effects, nor did the injection of solutions of HCl of equivalent pH, or normal saline.

Preliminary experiments with the chronic preparations indicate that cystathionine (5 mg) may shorten the onset of sleep " spindles " and the behavioural appearance of sleep to approximately 40% of control. In contrast, cysteine (5 mg) induced an e.e.g. activation pattern, behavioural hyperactivity, and delayed the onset of sleep about 2·5 times that of control. Homoserine and alpha-ketobutyric acid in doses of 5 mg failed to induce significant e.e.g. or behavioural changes.

The results of these experiments provide evidence in support of the hypothesis that in the free form cystathionine, and its cleavage product cysteine, may be important to normal brain function and play a role in the pathogenesis associated with certain inborn errors of metabolism.

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