Stereotyped behaviour induced by (−)-ephedrine in rats

Amphetamine induces stereotyped behaviour in rats which is characterized by the decrease of locomotor activity, compulsive continuous movements of head, sniffing, licking and biting (Randrup, Munkvad & Udsen, 1963; Randrup & Munkvad, 1969; Ernst, 1967, 1969). The stereotyped behaviour has also been described in mice, guinea-pigs, cats, monkeys, and in man (Randrup & Munkvad, 1967). The behaviour is seen also with substances chemically related to amphetamine and with substances that are not—like methamphetamine, phenmetrazine, pemoline, apomorphine, cocaine, and tryptamine (Fog, 1969; Randrup & Munkvad, 1969).

There appear to be no published reports implicating ephedrine in stereotyped behaviour, even though it is a β-hydroxylated derivative of methamphetamine. I now report the induction of stereotyped behaviour in rats by (−)-ephedrine.

Wistar rats of either sex, 180–200 g, were injected intraperitoneally with (−)-ephedrine, (BDH) 40–140 mg/kg. Groups of 5 rats were placed in wire cages (21 × 21 × 25 cm) for 4 h and stereotyped activity was scored every 0·5 h by a scoring system similar to that of Janssen, Niemegeers & others (1967).

In other experiments the influence of chlorpromazine (4 mg/kg), haloperidol (0·5 mg/kg), and L-α-methyldopa (400 mg/kg) on stereotypy induced by ephedrine and amphetamine was also scored. Chlorpromazine and haloperidol were injected 0·5 h, and L-α-methyldopa 3 h before (−)-ephedrine (100 mg/kg) or (±)-amphetamine (10 mg/kg).

Ephedrine, 40–80 mg/kg, induced only sniffing and non-continuous licking and biting. The sniffing was observed especially near the walls. With higher doses of ephedrine (100–140 mg/kg), the stereotyped behaviour was manifested by sniffing at the floor and continuous licking and biting. The same behaviour was observed after amphetamine 10 mg/kg. Ephedrine- and amphetamine-induced stereotypes were antagonized by chlorpromazine, haloperidol and L-α-methyldopa.

Agents producing abnormal behaviour may be divided into two groups; those acting directly like apomorphine, and those acting indirectly, presumably by the release of dopamine in the central nervous system, like amphetamine, (Ernst, 1967; Randrup & Munkvad, 1969; Maj & Przegaliński, 1967).

Thus, stereotypy induced by high doses of ephedrine 100–140 mg/kg resembles that produced by amphetamine both in behaviour and in the mechanism of its development.

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REFERENCES

ERNST, A. M. (1967). *Psychopharmacologia*, **10**, 316–323.

ERNST, A. M. (1969). *Acta physiol. pharmac. néerl.*, **15**, 141–154.

FOG, R. (1969). *Psychopharmacologia*, **14**, 299–304.

JANSSEN, P. A. J., NIEMEGEERS, C. J. E., SCHELLEKENS, K. H. L. & LENAERTS, F. M. (1967). *Arzneimittel-Forsch.*, **17**, 841–854.

MAJ, J. & PRZEGALIŃSKI, E. (1967). *J. Pharm. Pharmac.*, **19**, 341–343.

RANDRUP, A. & MUNKVAD, J. (1967). *Psychopharmacologia*, **11**, 300–310.

RANDRUP, A. & MUNKVAD, J. (1969). Biochemical, anatomical and psychological investigations of stereotyped behaviour induced by amphetamines. Symposium on Amphetamines and related Compounds, Milan.

RANDRUP, A., MUNKVAD, J. & UDSEN, P. (1963). *Acta pharmac. tox.*, **20**, 145–157.