

Concentrations of amphetamine in the brain in normal or aggressive mice

SIR,—It was recently reported that amphetamine is consistently more toxic in aggressive than in normal mice whether the animals are kept either grouped or isolated (Consolo, Garattini & Valzelli, 1965). To find a possible reason for this increased toxicity, experiments were made to measure the concentration of amphetamine in the brain in this experimental situation.

As previously described, male Swiss albino mice weighing about 20 g were usually kept 6 per Makrolon cage with a floor surface of about 40 cm² at a room temperature 22° and a relative humidity of 60%. Mice were made aggressive (Yen, Stanger & Millman, 1959) by isolation for 4 weeks in individual cages of the same size, but with opaque walls.

Dexamphetamine was administered intraperitoneally at 10 mg/kg to all the animals. Brain dexamphetamine was estimated as described by Axelrod (1954), 15, 30, 45 or 60 min after administration, and the results are summarized in Table 1.

TABLE 1. BRAIN AMPHETAMINE IN NORMAL AND AGGRESSIVE MICE ISOLATED (I) OR GROUPED (G) AT DIFFERENT TIMES AFTER ADMINISTRATION OF DEXAMPHETAMINE, 10 MG/KG/I.P. (Each figure represents the average of 8 determinations)

Time after administration (min)	Amphetamine in brain ($\mu\text{g/g} + \text{s.e.}$)			
	Normal		Aggressive	
	I	G	I	G
15	10.7 ± 0.6	17.4(°) ± 1.1	10.8 ± 1.4	12.6 ± 0.7
30	8.5 ± 0.6	15.0(°) ± 1.7	6.4 ± 0.7	12.4(°) ± 1.0
45	7.8 ± 1.0	10.4(°) ± 0.8	7.3 ± 0.4	12.8(°) ± 1.0
60	3.5 ± 1.0	9.4(°) ± 1.4	3.4 ± 1.0	11.0(°) ± 1.1

(°) $P < 0.01$ (G versus I).

It is evident that grouped animals, either normal or aggressive, have a higher and longer lasting level of amphetamine in the brain, but there are no significant differences between normal and aggressive animals.

It is concluded that the different metabolism of amphetamine between grouped or isolated animals may be a contributing factor in explaining the different toxicities of amphetamine under these two experimental conditions.

On the other hand a difference in amphetamine metabolism does not seem to play the major role which would justify the more pronounced sensitivity to amphetamine of aggressive mice compared with normal animals.

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