SHORT COMMUNICATION

ON THE PHENOMENON OF CAFFEINE INDUCED AUTOMUTILATION

By

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Chronic administration of caffeine was reported to produce a phenomenon of automutilation in rats. This effect was correlated with signs of central excitation (3). Earlier, psychotic-like reactions due to caffeine intoxication were reported by Boyd, *et al.* (1). No self-inflicted injuries were reported after administration of a signle lethal dose of caffeine. It was, therefore, proposed to study the incidence of automutilation in mice and rats treated with another central stimulant viz. methylamphetamine and compare it with caffeine.

MATERIALS AND METHODS

Stock albino mice (25-35 *g*) and rats (150-180 *g*), of either sex, were employed. They were housed individually as well as collectively. When grouped together, not more than 5 animals were housed in a cage of $25 \times 28 \times 10$ cm. All animals received the same diet consisting of wheat flour, wheat bran, root vegetables, green gram and groundnut oil, supplemented by table salt, calcium carbonate and vitamins A and D.

Drugs were administered intraperitoneally once daily every day, over a period of 40 days. The injections were given 15 to 30 minutes before feed. The following drugs and combinations were employed :

1. Physiological saline for the control group.
2. Caffeine citrate, 185 *mg/kg*.
3. Caffeine citrate, 185 *mg/kg*+chlorpromazine, 10 *mg/kg*.
4. Methylamphetamine, 20 *mg/kg*.
5. Methylamphetamine, 20 *mg/kg*+chlorpromazine, 10 *mg/kg*.

The animals were observed daily for signs of excitation and selfinflicted injuries.

RESULTS

Signs of central excitation appared after about the 14th day in all the mice treated with caffeine citrate and after about 3 days in those treated with methylamphetamine. These were manifested as increased motor activity in the form of rapid stereotyped movements of the fore-

limbs, running backwards, kicking with hindlimbs, etc. (Table 1). The nature of excitation was qualitatively the same with caffeine and methylamphetamine though it was more marked with the latter. However, no selfinflicted injuries were observed in any of these animals in spite of the marked excitation.

TABLE 1

Effect of central stimulants on mice

Treatment	Number of animals		Sex	Number of animals showing		No. of Deaths
	Aggregated	Segregated		Excitation	Automutilation	
1. Blank control	15	15	M	0	0	0
2. Caffeine citrate	15	15	M	30	0	0
3. Caffeine citrate + Chlorpromazine	15	15	M	0	0	0
4. Methylamphetamine	15	15	F	30	0	10
5. Methylamphetamine + Chlorpromazine	15	15	F	30	0	8

M : Male
F : Female

In order to eliminate the factor of species variation between mice and rats, studies were repeated with caffeine citrate on rats, but again no automutilation was observed, despite signs of excitation (Table II).

TABLE 2

Effect of central stimulants on rats

Treatment	Number of animals		Sex	Number of animals showing		No. of Deaths
	Aggregated	Segregated		Excitation	Automutilation	
1. Blank control	10	10	M	0	0	0
2. Caffeine citrate	20	20	M	40	0	5

M : Male
F : Female

Chlorpromazine antagonised the excitatory effects of caffeine but had no effect on those of methylamphetamine at the doses employed.

Preliminary studies showed that doses higher than those mentioned above proved lethal to more than 50 per cent of the animals in 10 to 15 days.

DISCUSSION

Peters (3) administered caffeine monohydrate, 185 *mg/kg*, by mouth daily to rats and observed a progressive excitation of the animals culminating in a hemorrhagic automutilation after approximately 14 days. This was more marked in individually caged animals. In the present study, however, no automutilation or self-inflicted injury was observed in any animal inspite of the presence of signs of central excitation even after 40 days. This difference may be due to a number of factors like the strain employed, innate behavioural pattern of the animals, environmental factors in the animal house like temperature, etc.

Chlorpromazine, in the doses employed in the present study, has antagonised caffeine induced excitation. However, it has failed to counteract the stimulant effects of methylamphetamine, even when the animals were grouped. Since chlorpromazine is known to reduce the acute toxicity of amphetamine in grouped animals (2) this may point to a difference between the acute and chronic toxicity of the amphetamines with regard to protection by chlorpromazine.

SUMMARY

Chronic administration of caffeine and methylamphetamine to mice and rats was observed to produce signs of central excitation, but did not result in a self-injuring behaviour. Chlorpromazine was observed to antagonise the excitatory effects of caffeine but not that of methylamphetamine.

REFERENCES

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