LETTER TO THE EDITOR

THE SEX-RELATED DIFFERENCE IN THE CONVULSANT ACTION OF PICROTOXIN IN RATS

Sir,

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Since sex-related differences in the activities of neurotransmitter systems in the brain are known (9), male and female animals may respond differently to centrally acting drugs. Picrotoxin acts as a central stimulant by blocking the inhibitory neuronal activity of ε-amino-butyric acid (GABA) in the brain (8). Its convulsive action was tested in this work in adult and immature rats (Wistar strain) of both the sexes to examine a sex-related difference, in any.

Picrotoxin (Sigma, U. S. A.) dissolved in distilled water was injected ip (3 *mg/kg*, 0.2 *ml*/100 g). The rats were then caged singly and observed for 1 hr. The time (in min) of appearance of the first clonic movement following the administration of picrotoxin was noted for each rat The incidence of tonic seizures (number of rats showing full extension of fore-limbs or both fore-and hind-limbs and mortality during the test period were recorded in each group (10 rats).

Consistent with a previous report (1), the data obtained (Table I) in this study reveal that adult female rats are more susceptible to picrotoxin-induced convulsions than adult

TABLE I : Effect of picrotoxin in adult and immature rats of both sexes.

Group Sex	*Age (month)*	*Weight (g)*	*Onset of clonic convulsions (min) Mean±S. E. M.*	*Number of rats in each group (n=10) showing*	
				Tonus	*Mortality*
1. Male	>4	150-200	10.4±0.9	0	0
2. Female	>4	150-200	7.0±0.3*	5	4
3. Male	<3	70-80	11.2±0.4	0	0
4. Female	<3	70-80	10.2±0.6	1	0

The rats were observed for 1 hr after picrotoxin injection (3 *mg/kg*, ip).
*$P<0.05$ compared to that of group 1 (Student's t-test).

males. Since female rats were reported to exhibit a greater sensitivity to electrically-induced convulsions also (1), a sex-related difference in drug metabolism is unlikely to be involved in this action. Since the convulsive responses of adult female rats were more pronounced than in any other groups, the female sex hormone was considered for lowering of seizure threshold. The proposal is supported since a direct application of oestrogen on to the cerebral cortex has been shown to result in epileptiform activity in the electroencephalogram of rats (2, 7). Furthermore, systemically administered oestrogen augments the action of various convulsants in experimental animals (3). Thus, these effects appear to result from an oestrogen-induced change in neurotransmitter mechanism in the brain. Oestrogens have been demonstrated to activate and to inhibit the activities of choline acetyltransferase and monoamine oxidase, respectively, in various brain regions (4, 6). However, evidence for their action on the activity of GABA which is involved in the actions of convulsants and anticonvulsants (5) is yet to be investigated.

To conclude the awarness of a sex-related difference in the action of convulsants may be useful in selecting animals (males or females) for the evaluation of anticonvulsant drugs.

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