

ANTICONVULSANT EFFECT OF IVERMECTIN

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Ivermectin (22,23 dihydro - avermectin B₁) an antiparasitic agent used in domestic animals (Campbell, 1981) is a member of a family of recently discovered anthelmintic agents, the avermectin that are produced by the actinomycete *Streptomyces avermitilis*. The antiparasitic action of ivermectin is reported to be achieved by its effect on the gamma amino-butyrac acid system of the parasite (Campbell *et al.*, 1983). Studies by Crichlow, *et al.* (1986) have shown that in genetically photosensitive epileptic chicken Ivermectin at 1.0 and 5.0 mg/kg decreased or prevented seizures induced by intermittent photic stimulation without any side effects on the central nervous system.

An attempt was made to study whether Ivermectin prevented seizures induced by picrotoxin in mice and maximal electroshock in rats.

Materials and Methods

This trial was conducted by inducing convulsions either by picrotoxin or maximal electroshock method. For picrotoxin induced convulsion, mice were used as experimental animal, with six animals in each group. Ivermectin was administered at the doses of 1.25 mg/kg, 2.5 mg/kg, 5 mg/kg, 7.5 mg/kg and 10 mg/kg body weight I/P. Four hours later, picrotoxin was administered I/P at a dose of 10 mg/kg body weight. The parameters noted in all these trials were whether there was abolition of clonic and tonic components of convulsion.

In the study involving maximal electroshock as a stimulus, rats were used as experimental animals. Electroconvulsimeter was made use in these trials. Rats were divided into groups of six animals each and were injected with ivermectin at doses 2.5 mg/kg, 5 mg/kg, 7.5 mg/kg and 10 mg/kg body weight I/P. Four hours later these animals were subjected to maximal electroshock test using a magnitude of 162 ma for 0.2 sec, using aural electrodes. The observations and parameters as in the previous trial were recorded.

Results and Discussion

Picrotoxin at a dose of 10 mg/kg body weight has been found to produce satisfactory convulsions in mice. 1.25 mg/kg of ivermectin injected I/P did not abolish both clonic and tonic component of convulsion induced by picrotoxin. Similarly 2.5 mg/kg of ivermectin did not inhibit or abolish the clonic and tonic component of convulsion induced picrotoxin administration (Table 1).

Table 1 Effect of Ivermectin on Picrotoxin induced convulsion

Sl. No.	Treatment with ivermectin (mg/kg)	% of abolition of convulsion	
		Clonic component	Tonic component
1	2.5	Nil	Nil
2	5.0	33.33	100
3	7.5	66.67	100
4	10.0	73.33	100

5 mg/kg of ivermectin abolished clonic component of convulsion induced by picrotoxin by 33.33 % and tonic component of convulsion in all animals tested. 7.5 mg/kg of ivermectin abolished clonic component of convulsion in 66.67% of animals tested and tonic component in 100% of the animals. 10 mg/kg of ivermectin abolished tonic component of convulsion in 100% and clonic component in 73.33% (Table 1). These results confirm that ivermectin in a dosage level of 5 mg/kg, 7.5 mg/kg and 10 mg/kg abolished tonic convulsion produced by picrotoxin and also showed dose dependent gradual suppression of clonic component of convulsion.

In experiments with maximal electroshock test it was found that 2.5 mg/kg and 5 mg/kg of ivermectin did not abolish clonic or tonic component of the convulsion. 7.5 mg/kg of ivermectin produced no effect on clonic component of convulsion but controlled tonic component in 50% of the animals tested. 10 mg/kg of ivermectin had no effect on clonic component produced by the electroshock but abolished tonic component in 66.67% of the animals tested (Table 2). The results of these trials indicate that ivermectin at the higher doses of 7.5 mg/kg and 10 mg/kg body weight only reduced the tonic component of convulsion in a dose dependent fashion and had no effect on clonic component. These findings agreed with that of Crichlow *et al.* (1986).

Table 2 Effect of Ivermectin on Maximal electroshock induced convulsion

Sl. No.	Treatment with ivermectin (mg/kg)	% of abolition of convulsion	
		Clonic component	Tonic component
1	2.5	Nil	Nil
2	5.0	Nil	Nil
3	7.5	Nil	50
4	10.0	Nil	66.67

Summary

The anticonvulsant effect of ivermectin was noticed at 5 mg/kg, 7.5 mg/kg and 10 mg/kg in picrotoxin induced convulsion. In maximal electroshock induced convulsion, ivermectin at 7.5 mg/kg and 10 mg/kg body weight controlled only the tonic component of convulsion but had no effect on clonic component.

Reference

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