

SHORT COMMUNICATION

NEUROPHARMACOLOGICAL EFFECTS OF IVERMECTIN IN MICE

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Abstract: Neuropharmacological effects (Spontaneous locomotor activity, forced locomotor activity and anticonvulsant activity) of ivermectin were studied at 400, 800 and 1600 µg/kg (administered, subcutaneously). Spontaneous locomotor activity was reduced at all the dose levels but forced locomotor activity was slightly reduced at 800 and 1600 µg/kg. The drug did not exhibit any anticonvulsant potential at any of the dose levels studied.

Key words: ivermectin neuropharmacological effects mice

INTRODUCTION

Ivermectin, a novel drug of macrocyclic lactone group of antibiotics, has been widely accepted for the treatment and control of nematodes and insects in man and animals (1, 2, 3, 4). Recently adverse reactions related to central nervous system have been reported in man and animals (3, 5). In view of putative GABA-mimetic action of ivermectin, it was considered expedient to report the effects of the drug on some neuropharmacological profiles. The present communication, therefore, reports the effects of ivermectin on muscle tone, spontaneous locomotor activity and supra-maximal electric shock in mice.

METHODS

Male Swiss albino mice (25-35 g) procured from Central Research Institute, Kasauli (H.P.) were used. The animals were fed standard pellet diet with wheat porridge and water *ad libitum*.

Ivermectin# (Ivomec, 1% diluted with NSS) was administered in doses of 400, 800 and 1600 µg/kg subcutaneously. The number of animals in each group was six. Control

animals were injected equal volume of normal saline.

The effect of ivermectin on Spontaneous locomotor activity (SLA), Forced locomotor activity (FLA) and Maximal Electro shock seizures was studied using photoactometer (Techno), Rota rod (Techno) and Electro convulsimeter (Techno).

RESULTS AND DISCUSSION

Ivermectin at all the tested dose levels caused a reduction in locomotor activity (Table I). The maximum reduction was seen at 150-210 min of ivermectin administration.

A slight reduction in forced locomotor activity was observed with the ivermectin administered at 800 and 1600 µg/kg at 120 and 240 min of drug administration.

Anticonvulsant potential of drug could not be detected from the electro convulsimeter studies (50 mA, 0.2 sec by pinnal electrodes). The drug failed to block the extensor response by electric current.

Ivermectin is known to produce antiparasitic action by enhancing release of

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TABLE I: Effect of ivermectin on spontaneous locomotor activity (SLA and forced locomotor activity (15 rpm, x 2 min)

Time (min) post- administration	Photoactometer counts (10 min)*		
	400 µg/kg	800 µg/kg	1600 µg/kg
0	90	84	84
30	82	47	49
60	66	60	38
150	34	26	16
210	14	33	18

Time (min) post- administration	% of animals falling from rotarod*		
	400 µg/kg	800 µg/kg	1600 µg/kg
0	0	0	0
120	0	0	16.6
180	0	16.6	16.6
240	0	16.6	16.6

*n=6; 0 time denotes control values.

GABA from GABA-ergic presynaptic nerve terminals and its subsequent binding on post synaptic membrane of excitatory motoneurons in nematodes and post-junctional membrane of muscle cells in arthropods (3). Reduction in spontaneous locomotor activity and a slight reduction in forced locomotor activity could results from potentiation of GABA mediated inhibitory actions of local motoneurons in brain especially in cerebellar cortex and limbic system (6).

Adverse drug reactions related to central nervous system as observed by earlier workers such as ataxia were not observed in our studies. The dose levels (upto 1600 µg/kg) could not have produced any appreciable CNS effect as extremely low levels of ivermectin are attained in brain, the site of GABA containing neurons in mammals (7).

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