EFFECT OF 30-DAY FEEDING OF PIPERAZINE ON RATS

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Summary: The effect of 30-day feeding of 150 *mg/kg* dose of the anthelmintic, piperazine has been studied in rats. The results obtained are more or less in line with the pharmacological and physiological investigations carried out by other investigators using piperazine and its derivatives. One significant observation which is now under detailed investigation is that piperazine-treated animals had low total lipid levels in the various organs such as liver, muscle, kidney, heart and lungs in comparison to non-piperazine treated animals maintained under identical conditions.

Key words: piperazine anthelmintic rat tissue lipid level

INTRODUCTION

Piperazine is widely used as an anthelimintic drug of choice for the treatment of round-worm infestation in man and has replaced drugs such as chenopodium oil and santonin which were in use until about the 1960's. Its therapeutic index is very high (3). One of the most important reasons for its wide use is its apparent safety to the hosts (1,2,5). However, some untoward effects have been observed in some cases (3). No systematic attempt seems to have been made to study the biochemical effects of long term administration of this drug on the host. This becomes all the more significant, because of the fact that successful therapy using piperazine requires administration of the drug for more than one day and for 7 days for the thread-worm infestation.

Some preliminary biochemical findings are reported in this paper.

MATERIALS AND METHODS

Twelve Sprague-Dawley male albino rats 3 months old and weighing 130-150 *g* were used for the study. They were fed laboratory diet (Hindustan Lever rat feed) for a week before and throughout the 30-day experiment. The animals were divided into 2 equal groups. Animals in group 1 were observed as controls for thirty days, while those in group 2, kept under identical conditions, were given a solution of piperazine, 150 *mg/kg* daily. Piperazine hexahydrate obtaincd from Navaratna Pharmaceuticals, Ernakulam; the solution was neutralised with citric acid and diluted to give a concentration of 30 *mg* piperazine/*ml* through a stomach tube for 30 days. Total lipid content in the different tissues were estimated by the gravimetric method described in Clinical Laboratory Methods and Diagnosis (4).

RESULTS AND DISCUSSION

The general condition of the piperazine-treated rats was comparable to that of the control group and no untoward visible symptoms were observed during the period. The average weight gain of the animals in the two groups was also comparable (control group: 28 *g*; and piperazine-treated group : 31 *g*).

The data on total lipid levels in the tissues of the control and the test groups are given in Table I. The levels in the treated group were lower. Glucose tolerance curve performed 2 days prior to sacrificing was similar in both the control and the test groups. The fasting blood sugar level and the level 2 *hr* after the *ad lib* administration of glucose, were 84.0 ± 5.6 and 97.2 ± 3.9 *mg*/100 *ml* of blood respectively for the control and 92.0 ± 3.9 and 104.0 ± 4.6 *mg*/100 *ml* blood respectively for the test. Both groups had more or less the same level of glycogen content in liver, muscle, kidney, lung and heart. There was practically no difference in the DNA and RNA and protein contents of liver in the two groups.

TABLE I: Effect of 30-day administration of piperazine on the lipid content of some tissues of rats.

	Lipid level ± S.E.					
	Liver mg/g	*Muscle mg/g*	*Heart mg/g*	*Kidney mg/g*	*Lungs mg/g*	*Serum gm/100 ml blood*
Control	52.0 ± 4.1	21.2 ± 1.9	33.04 ± 1.1	52.8 ± 2.8	40.0 ± 3.9	680 ± 10.6
Piperazine-treated	41.0 ± 2.2	16.5 ± 1.8	29.5 ± 1.3	39.8 ± 3.2	24.7 ± 4.0	440 ± 15.4

The human dose of piperazine is 150 *mg/kg* daily for 2 days for the round-worm infestation and 75 *mg/kg* daily for 7 days for the thread-worm infestation. The dose used for rats is thus not very high by the human standard.

The results seem to agree with the inference of various investigators (3) that piperazine is quite a harmless drug. However, the decreased average lipid level in the piperazine-treated rats looks interesting and is being further investigated into.

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