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Allyl Alcohol-induced Hepatotoxicity in Rats and its Protection by Liv.52

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Allyl alcohol has been shown to cause hepatic necrosis in rats, and Eger (1964) described a method to assess the damage quantitatively, semi-macroscopically. Functional protection against the hepatotoxic effects of carbon tetrachloride by Liv.52 has been demonstrated previously in our laboratory (Joglekar *et al.* 1963; Karandikar *et al.* 1963; Kale *et al.* 1966). We also demonstrated the protection against structural damage histologically (Ibid). But quantitative assessment in this respect was not possible. Hence we decided to test Liv.52 against ally alcohol damage to the liver.

MATERIALS AND METHODS

Sixteen female rats weighing between 100 and 120 g were divided into two groups. Animals were given half the quantity of usual diet for two days and only water was allowed on the 3rd day – the day preceding the experiment. On the day of the experiment the test group was given 1 ml of Liv.52 oral liquid by stomach tube and the control group was given 1 ml of tap water by stomach tube. Three hours later rats from both groups received 0.4 ml allyl alcohol per 100 g body weight. The rats were observed for 40 hours and were then sacrificed.

Five lobes from the liver of each rat were dissected out and both surfaces of each lobe were examined under camera lucida. The area of each surface of every lobe was drawn on a graph paper through camera lucida and necrosed area marked therein. The total area and area of necrosis was measured in square centimeters and percentage of necrosis calculated.

RESULTS

The following Table shows the degree of liver necrosis in control and Liv.52 treated group of rats.

Table

Control (Area in sq.cm.)			Liv.52 treated (Area in sq.cm.)		
Total	Necrosed	% Necrosis	Total	Necrosed	% Necrosis
97.66	19.56	20.00	92.56	4.84	5.20
84.26	10.80	13.20	90.28	2.48	2.70
88.43	15.90	19.00	77.92	6.16	7.90
79.64	16.40	20.30	86.28	3.12	3.60
100.32	15.36	14.80	92.24	2.60	2.80
95.63	17.30	18.00	81.44	4.56	5.60
93.28	15.40	16.20	93.36	5.00	5.30
94.46	16.80	17.90	91.36	7.44	8.10
Total		139.40			41.2
Mean ±SE		17.4 ± 0.9			5.1 ± 0.5

			$p<0.01$

DISCUSSION

Contrasting with the phenomenal success in almost every branch of therapeutics, the treatment of liver disorders is very unsatisfactory. Many indigenous plants are claimed to have a stimulant and restorative effect on the liver (Kirtikar and Basu, 1933).

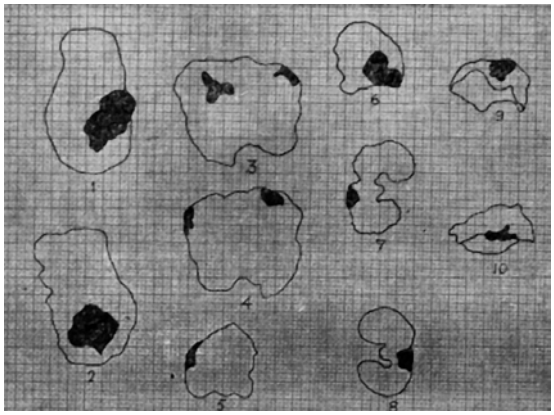

Fig. 1: Showing degree of liver necrosis caused by allyl alcohol in rats

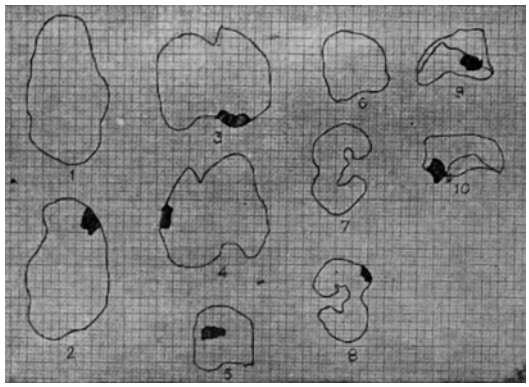

Fig. 2: Showing minimal degree of liver necrosis in rats treated with allyl alcohol plus Liv.52

It is difficult to assess with any degree of accuracy the clinical improvement in liver disorder. Hence it was thought that this quantitative experimental evidence would be a better guide to the clinical effectiveness of any preparation. Eger (1964) has described allyl alcohol test, which is a simple, rapid and easy screening procedure for testing liver protective effect. We have used the same test with little modification in our method of quantitative assessment. Allyl alcohol when given to rats produced hepatic necrosis, which consolidated after 36 hours and was obvious microscopically. Thus it is possible to assess the liver necrosis quantitatively. From Table it can be clearly seen that Liv.52 significantly reduced the allyl alcohol-induced hepatic damage and thus corroborates the reported clinical effectiveness of this drug.

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