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Effect of Ethanol on Liver Function and its Relation to Hangover: Protective Effect of Liv.52

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Alcoholic beverages are socially popular. Chronic alcoholism is known to cause liver damage. Acute alcohol intoxication is known to cause prolonged hypoglycaemia and effect of ethanol on liver in reducing gluconeogenesis is thought to be responsible for hypoglycaemia (Arkay and Freinkel, 1966)[1]. Increase in SGOT levels in serum of chronic alcoholic patients and nonalcoholic volunteers after ingestion of alcohol has been reported (Rubin and Leiber, 1968)[2]. Dattani *et al.,* (1972)[3] observed increased BSP retention after social alcohol consumption. Social alcohol ingestion leads to malaise, headache and uneasy feeling generally termed as hangover in some subjects.

Though bromsulphathalein retention is a sensitive test for polygonal cell function of liver, its estimation in serum especially in the presence of jaundice is not very accurate. Rose Bengal, which is similar to BSP, can be tagged with radioactive iodine. This increases the accuracy and sensitivity of its detection and has been used to evaluate liver function using simple probes (Mortek and Owen,[4] 1958; Lum *et al.,* 1959). Both these workers achieved only partial separation of gross liver dysfunction from normal.

Whole body counter with profile scanning device has been used to determine absorption and selective concentration of Iodine in the thyroid gland (Kulkarni, *et al.,* 1977)[6].

With this knowledge we decided to apply the same methodology for quantitative determination of hepatic uptake of intravenously injected labelled Rose Bengal. Addition of Body Segment Counter to the whole body profile scanner further increased the accuracy.

Joglekar *et al.,*[7] (1963) demonstrated protective effect of Liv.52 against carbon tetrachloride induced liver damage in rats. Joglekar *et al.,*[8] (1966) also demonstrated the efficacy of Liv.52 in protecting rats against the liver damage induced by ethanol.

We, therefore, decided to evaluate the effects of social ingestion of alcoholic beverages on the polygonal cell function of the liver determined by Rose Bengal uptake and also to study if Liv.52 had any protective effect. We also devised a questionnaire to evaluate subjective feelings on the following morning.

MATERIAL AND METHODS

Subjects: Twenty healthy men aged between 35 and 50 years who are moderate consumers of alcoholic beverages for the past 3 to 15 years volunteered for this study. The following investigations were carried out to confirm healthy state. Complete haemogram, serum proteins, and urine examination including microscopic and GOT.

1. A particular brand of Indian whiskey
2. Lime juice
3. Liv.52 tablets
4. Placebo tablets.

Protocol for Study
Each subject was advised not to consume alcoholic beverages for 3 days before the study. The subject reported at 6 p.m. and was comfortably housed. From 7 p.m. onwards he was given 30 ml of whiskey with soda and ice or limejuice with soda and ice every 30 minutes for 5 doses. Wafers, boiled eggs and cheese were allowed. Two hours after the last dose, liver function test was performed and subject was allowed to go to sleep.

At 7 a.m. next morning, the subjects were given a questionnaire to assess the effect of alcohol ingestion and were required to mark on an analogue scale, their subjective feeling of depression.

The subject was then given either Liv.52 tablets or placebo tablets according to random allocation in the dose of 2 tablets 3 times a day for 15 days; the study was repeated again after 15 days. For the first 12 days of this drug period, the subjects were allowed to consume alcoholic beverages as usual.

On every study day, two subjects were called except for the first two and last two studies when only one subject was present. When two subjects were called, one was a fresh study and the other was post-drug treatment study.

Liver Function Test
The subject was given Rose Bengal I^{131} (supplied by B.A.R.C., Trombay) intravenously in the dose of 30 microcurie. Total body counts and liver segment counts were recorded with the help of whole body counter with body segment counter (fabricated by Body Burden Measurement Section of B.A.R.C.). Liver segment counts at 30 minutes after injection of Rose Bengal divided by whole body counts was taken as Rose Bengal uptake of liver and was expressed as per cent of total body counts.

Score for Depression and Hangover
Headache: Present 2, absent 0
Nausea: Present 2, absent 0
Bodyaches: Present 1, absent 0
Burning of eyes: Present 1, absent 0
Slept well: Yes 0, No 1.

Analogue Scale
Feeling lousy 10 cm Feeling fresh

RESULTS

Table 1: Shows the per cent uptake of Rose Bengal by liver in subjects consuming alcohol before and after therapy with Liv.52 or placebo (mean ± SE)

Control Limejuice (10)	Control Whiskey (10)	Liv.52 treated Whiskey (11)	Placebo treated Whiskey (9)
70.65 ± 1.97	64.86 ± 2.3	71.6 ± 3.1	63.2 ± 2.68
p 0.05			*p* 0.05

Table 2: Showing the score for depression and analogue rating of subjects

	Control Limejuice	Control Whiskey	Liv.52 Whiskey	Placebo Whiskey
Score for depression	1.6 ± 8.6	4.8 ± 2.1	2.8 ± 6.4	4.1 ± 3.5
Analogue rating	± 1.4	± 1.86	± 1.7	± 0.86

DISCUSSION

Bromsulfalein excretion test was the most sensitive index of parenchymal cell function. Its estimation especially in jaundiced patients may not be very accurate. Several attempts to use radio-iodinated Rose Bengal and count the rate of increase in hepatic radioactivity did not increase the accuracy significantly. Our newly developed method using the Body Segment Counter and radio-iodinated Rose Bengal has proved to be a very sensitive and accurate test for parenchymal cell function. Thus, in normal individuals, the hepatic extraction of intravenously radio-iodinated Rose Bengal is 70.65 per cent with a very small standard error (± 1.97). Consumption of 150 ml of a common brand of whiskey produces significant decrease in hepatic extraction of the dye. Treatment with Liv.52 prevents this effect of alcohol.

On the subjective side the symptoms of hangover are noticed when whiskey is consumed but the score was much less in Liv.52 treated patients. Though the values do not show statistical significance, it is obvious that subjects treated with Liv.52 had less signs of hangover. Thus at least part of the symptoms of hangover may be due to impairment of liver functions by alcohol.

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