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Hepatoprotective Role of Liv.52 in Toxic Conditions of Liver — An Ultrastructural Study

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INTRODUCTION

In the modern system of medicine, there is no specific cure for a wide spectrum of liver diseases prevalent all over the world, which includes infective hepatitis, chronic active hepatitis and cirrhosis. The therapeutic regimen followed in these cases up to the present moment is by and large symptomatic and at best palliative, which still confronts the practitioner with a formidable task. Inspite of such a situation, attempts are perpetually being made to find out some effective therapy for these conditions. The aim of the study was to evaluate the hepatoprotective effects of Liv.52 (a herbal preparation marketed by The Himalaya Drug Co., Bombay, India) in experimental conditions, which is quite frequently prescribed in our country as well as many other parts of the world for various liver disorders. Even though a lot of clinical as well as experimental data with varying degree of severity of liver diseases is now available establishing the hepatoprotective potential of this preparation, but most these studies are biochemical oriented.

MATERIALS AND METHODS

Experimental Design

Male Albino rats weighing 150-180g were divided into three groups viz. A normal group, control group and a treatment group. The rats were injected subcutaneously with 0.2ml of carbon tetrachloride (CCl_4) mixed with 0.2ml of groundnut oil, twice a week in both CCl_4 and CCl_4 + Liv.52 treatment groups. In addition to the CCl_4 treatment, the animals in the treatment group also received 0.5 ml of Liv.52 syrup orally. All the aforesaid treatments continued for a period of six weeks. To monitor the actual extent of liver damage at a given time, various marker enzymes viz. AST, ALT and alkaline phosphatase were also assayed in serum as a function of time.

Specimen Preparation for EM

At the time of sacrifice, liver specimens were sliced out and were processed by routine technique standardized in our laboratory, involving glutaraidehyde Osmium tetraoxide double fixation, acetone dehydration and final embedding in Epon-araldite resins. Uttrathin sections of silver-golden colour were cut on a Ultracut microtome, double stained with Uranyl acetate-Lead citrate and finally viewed under a JEOL, JEM-1200 EX microscope.

RESULTS

The present study revealed that animals injured with CCl_4 showed marked elevation in the levels of all the hepatic marker enzymes. Moreover, as for as the ultrastructural status was concerned, these animals showed a severe degree of structural disintegrity when compared to controls, which mainly comprised the membranous moieties of the cells. The main discernible effects include: mitochondrial swelling with lesser number of cristae, Nonuniform and scattered lamellae of rough

endoplasmic reticulum (RER), lesser concentration of this organelle at places, detachment of ribosome from RER, increased number of ribosome in the cytoplasm, bilayered nuclear membrane was disrupted at places, nuclear vacuolization was evident, chromatin clumping around the nucleus was seen, extent of SER was too much and it was present in the form of tiny sacs, golgi bodies were missing, certain strange bodies of unknown origin were also there. All these features were expected to be observed because of the peroxidative properties of CCl_4. However, following, Liv.52 treatment to these animals, a certain improvement in the histoarchitecture of the organ was seen. However, a few areas of hyaline vacuolization increased SER as well as more number of ribosome in the cytoplasm and disrupted nuclear membrane at one or two sites was seen. The present study revealed the usefulness of Liv.52, a herbal preparation in maintaining the structural integrity of Ever in CCl_4 induced toxicity.