

Hepatoprotective Influence of Vitamin C on Thioacetamide-induced Liver Cirrhosis in Wistar Male Rats

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ABSTRACT

Liver cirrhosis is a worldwide health problem and one of the most prevalent chronic diseases. Cirrhosis is scarring of the liver that involves the formation of fibrous (scar) tissue associated with the destruction of the normal architecture of the organ. Hence, the investigation for an efficient hepatoprotective drug is an urgent need. In the present study an attempt was made to investigate whether vitamin C could prevent liver cirrhosis induced by thioacetamide (TAA) in Wistar male rats. The chronic administration of TAA for a period of 10 weeks increased the levels of serum total bilirubin, triglycerides, cholesterol, alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP), gamma glutamyl transferase (GGT), creatine kinase (CK) and lactate dehydrogenase (LDH), while the levels of glucose, total protein, albumin and the values of red blood corpuscles (RBC) count, hemoglobin (Hb) concentration, hematocrit (Hct) and white blood corpuscles (WBC) count were statistically decreased. Moreover, the administration of TAA induced hepatic nodular transformations and the parenchyma nodules surrounded by fibrous septae. TAA administration induced centrilobular necrosis, hepatic cells surrounding central vein showed various degenerative changes like cloudy swelling, hydropic degeneration and necrosis with loss of nucleus. The administration of vitamin C after TAA intoxication led to decrease the severe biochemical, hematological and histopathological changes. But more overt protections were observed in rats supplemented with vitamin C before TAA exposure. The present findings suggest that pretreatment with vitamin C could be more useful for the prevention of hepatic cirrhosis induced by TAA in rats.

Key words: Liver cirrhosis, thioacetamide, vitamin C, physiology, histopathology, rats

INTRODUCTION

The liver is a large and complex vital organ, and considered to be one of the most vital organs that functions as a centre of metabolism of nutrients such as carbohydrates, proteins and lipids, and excretion of waste metabolites. Additionally, it is also handling the metabolism and excretion of drugs and other xenobiotics from the body thereby providing protection against foreign substances by detoxifying and eliminating them (Meyer and Kulkarni, 2001; Saleem *et al.*, 2010). Because the liver performs so many vital functions, liver damage can impact almost all body systems. In today's world, the liver has to work harder than ever before, and all over the world we find that liver problems are increasing. Globally, one in every ten persons suffers with some type of liver, bile duct or gall bladder disease. Liver cancer (hepatocellular carcinoma) is one of the ten most common cancers in the world with over 2,50,000 new cases each years and has a poor outlook (Gupta and Misra, 2006). Three hundred and fifty million people worldwide suffer from hepatitis B which kills