

Role of Curcumin Administration on Experimentally Induced Nonalcoholic Steatohepatitis (NASH)

Nahla Mohammed Abd El-Hameed¹, Azza Hussein Ali¹, Hanna Hassanein mohammed¹, Mahmoud A. khattab² and Seham A Abd El-Aleem¹

¹Department of Histology and cell biology, ²Department of internal medicine, Minia University

Corresponding Author

Nahla Mohammed Abd El-Hameed

nahla.mohamed@minia.edu.eg

Abstract:

Background: The strong association of NASH with sedentary lifestyle and dietary habits drives the need for further investigations. Curcumin is a natural herbal believed to be hepatoprotective.

Aim: To study curcumin as a prophylactic agent in NAFLD rat model.

Material and Methods: thirty rats were allocated into 3 groups. Normal control, high fat diet (HFD) and the prophylactic groups. HFD regimen was given for 4 months. Curcumin was given as a prophylactic along with HFD. Livers were harvested and processed for histological study.

Conclusions: Curcumin has an efficient protection and hindering of the development of NASH and could be recommended in NASH susceptible people.

Introduction

The strong association of NASH with sedentary lifestyle and dietary habits drives the need for further investigations. Curcumin is a natural herbal, antioxidant, and anti-inflammatory. The aim is to study the prophylactic effect of curcumin on a rat model of NASH.

Results: in HFD group the liver showed remarkable histological changes including; vascular congestion, inflammatory cellular infiltration, hepatocyte ballooning with intracellular accumulation of fat and signs of fatty degeneration at cellular level. Interestingly curcumin prophylactic group showed preservation of the liver cellular structure to high extent.

The results can be demonstrated by images below:

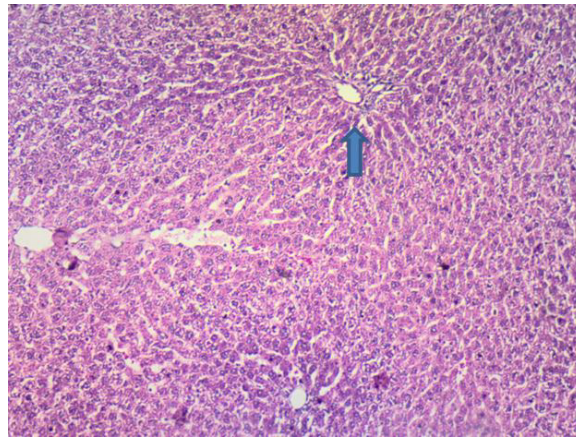


Fig.1: A representative photomicrograph of normal liver tissue of adult male albino rat showing; central vein surrounded by normal hepatocytes arranged in cords radiating from a central vein (blue arrow) (H&E x 100)

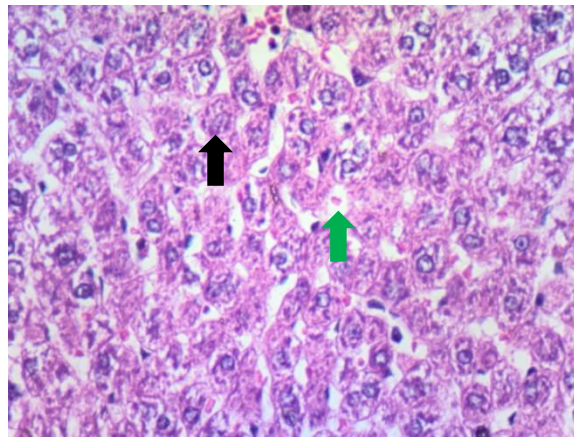


Fig.2: A representative photomicrograph of liver tissue of adult male albino rat of HFD group showing; A: portal tract at the periphery of hepatic lobule (blue arrow) (H&E x 100).

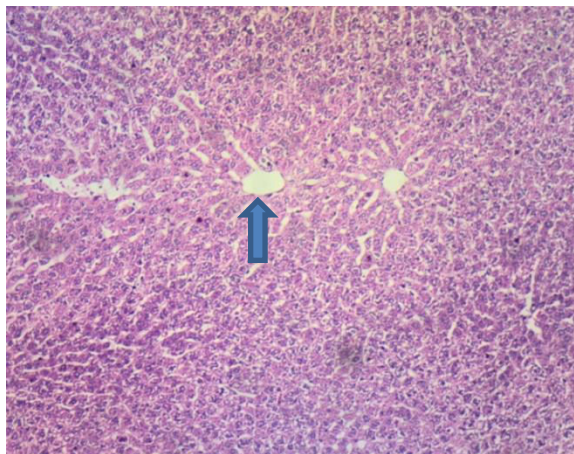


Fig.3: A representative photomicrograph of liver tissue of adult male albino rat of curcumin group showing; normal hepatocytes with central rounded vesicular nuclei and acidophilic granular cytoplasm (black arrow), blood sinusoids are seen in between the hepatic cord (green arrow) (H&E x400).

Body

The prevalence of NASH has increased markedly with sedentary lifestyle and changes in dietary habits (Vizzutti et al., 2010). NASH starts as nonalcoholic fatty liver disease (NAFLD)-simple steatosis- and it may lead cirrhosis (Sena et al., 2018). The pathogenesis of NASH remains unclear. It has been shown that a high-fat diet (HFD) is important in the pathogenesis of human NASH (Sena et al., 2018).

HFD group showed marked congestion of portal vein branches with portal tract infiltration of inflammatory cells. These findings can be explained as a result of oxidative stress. Similar findings were observed in experimentally induced NASH on rat models by (Xu et al., 2010). Inflammation is considered one of the characters of NASH disease by (Caligiuri et al., 2016).

Curcumin, the yellow pigment of the plant *Curcuma longa*, is a potent antioxidant. It is widely used for food preparation (Vizzutti et al., 2010). Curcumin suppresses oxidative stress and also has anti-inflammatory effect (She et al., 2018).

Curcumin prophylaxis decreased inflammation and preserved hepatocytes to appear almost near normal structure. That may be explained by the anti-oxidant effect of curcumin that reversed the toxicity of high lipid environment. (Vizzutti et al., 2010) was in the same line as reporting of improvement of curcumin treated group.

Conclusions: Curcumin has an efficient protection and hindering of the development of NASH and could be recommended in NASH or even NAFLD susceptible people.

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Illustrations:

NASH: non-alcoholic steatohepatitis

NAFLD: non-alcoholic fatty liver disease.

HFD: high fat diet.