



## Effects of leptin on histomorphometry of liver in high-fat diet fed obese rats

Elfide Gizem Kıvrak\*, Işımsu Aydın, Gamze Tümentemur, Berrin Zuhale Altunkaynak, Süleyman Kaplan

<sup>a</sup> Department of Histology and Embryology, Faculty of Medicine, Ondokuz Mayıs University, Samsun, Turkey

### ARTICLE INFO

### ABSTRACT

#### \* Correspondence to:

Elfide Gizem Kıvrak  
Department of Histology and Embryology,  
Faculty of Medicine,  
Ondokuz Mayıs University, Samsun, Turkey  
e-mail: elfide.gzm@gmail.com

#### Keywords:

High Fat Diet  
Leptin  
Non-alcoholic fatty liver disease  
Obesity  
Rat

Obesity, is one of the most significant and common diseases of today's world. Leptin, one of the most important adipose-derived hormones and among the best-known hormone markers for obesity and it plays a key role in regulating stable body weight and is synthesized and released by the fat cells in adipose tissue. So leptin has used for obesity treatment. The aim of this study; to detect effects of high fat diet induced obesity and leptin on liver by using physical disector and Cavalieri methods. This study was including four groups: Non-obese control, obese control, non-obese Leptin and obese-Leptin groups. Liver of all animals were prepared and stained with hematoxylin eosin for stereological and light microscopical analyses. The volume of liver was calculated by Cavalieri methods and the number of hepatocyte was analyzed by physical disector. Liver volumes of control and obese groups were significantly different from the each other. The mean numerical density of hepatocytes for the obese group was significantly decreased in comparison to the control group. But Leptin application lead to a significant increase of hepatocyte number in obese-leptin group after fatty diet induced obesity. In nonobese-control and nonobese-leptin group, livers had healthy histological structure. But livers of obese-control group, steatosis, ballooning degeneration and hypertrophied cells were found. Also between hepatocyte plates, possible dead hepatocytes with small dark cytoplasm and pycnotic nuclei were seen. In sinusoids, fibrin deposits were detected. In obese-leptin group, steatosis was decreased and any hypertrophic cell or possible dead cells were not observed. Moreover sinusoids didn't include any deposits. These obtained data demonstrated that leptin has a protective effect on the liver in terms of morphometrical parameters which are liver volumes and number of hepatocytes and histological structure in fatty diet induced obese rat model.

*J. Exp. Clin. Med., 2014; 31:137*