

# Stereologic characteristics of the liver of rats (*Rattus norvegicus*) submitted to ovariectomy-induced menopause [Características estereológicas del hígado de rata (*Rattus norvegicus*) sometidas a menopausia inducida por ovariectomía]

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During menopause, hormonal changes such as decreased estradiol and increased follicle stimulating and luteinizing hormones occur. In premenopausal women fibrosis and hepatic steatosis is less than in postmenopausal women and improves when hormone replacement therapy is administered. The aim of this study was to determine quantitative aspects of the liver of rats undergoing an experimental model of ovariectomy-induced menopause. We used 10 Sprague-Dawley (*Rattus norvegicus*) healthy adults. The rats were weighed and divided into two groups (bilateral oophorectomy = Group Ovx and control = Group Sham). The animals were sacrificed at 60 days and the liver removed, obtaining a piece of each liver. Five cuts were made of 4 microns and stained with HE. We analyzed five fields per slide. M42 test was used. Stereological parameters considered were as follows: Nv, Vv, Sv and total number (Tn) of hepatocytes and sinusoids. The average weight of Ovx and Sham group was 300.8 g and 285.8 g, respectively. The Nv of hepatocytes of rats subjected to sham surgery (CS) and Ovx (CO) was 6.89 and 7.70  $\times 10^5/\text{mm}^3$ , respectively. The Vv of CS and CO hepatocytes was 71.92% and 80.48%, respectively. SV and CO, CS hepatocytes was 260.61  $\text{mm}^2/\text{mm}^3$  and 273.64  $\text{mm}^2/\text{mm}^3$ , respectively. The average volume of CS livers was 8.40  $\text{mm}^3$  and hepatocyte Tn averaged 5.79  $\times 10^6$ . The average volume was 9.28  $\text{mm}^3$  CO livers and Tn of 7.15  $\times 10^6$ . Regarding the sinusoids, the Nv in the liver CS and CO was 2.81  $\times 10^5/\text{mm}^3$  and 2.64  $\times 10^5/\text{mm}^3$ , respectively. The Vv of sinusoids in CS and CO was 16.74% and 16.46%, respectively. The sinusoids in rats Sv CS and CO was 49.40  $\text{mm}^2/\text{mm}^3$  and 45.21  $\text{mm}^2/\text{mm}^3$ , respectively. The sinusoids Tn CS and CO averaged 2.37  $\times 10^6$  and 2.45  $\times 10^6$ , respectively. The lack of estrogen can cause fibrosis and hepatic

steatosis as noted by other authors, but also changes in the organization and the proportion of the components of the liver, factors to consider during diagnosis and prognosis of liver disorders.

Liver

Ovariectomy-induced Menopause

*Rattus norvegicus*

Stereology