

UDC: 613.81/613.84+612.345

COMPARATIVE ANALYSIS WITH THE CONTROL GROUP OF CHANGES IN  
THE MORPHOLOGICAL AND MORPHOMETRIC PARAMETERS OF THE  
PANCREAS IN NINE-MONTH-OLD RATS UNDER THE INFLUENCE OF  
EXPERIMENTAL ALCOHOL INTOXICATION

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Aim of the study. To determine the morphological and morphometric changes occurring in the exocrine and endocrine parts of the pancreas, to analyze their interrelationship, and to evaluate their pathogenetic significance by modeling experimental alcohol intoxication in 9-month-old outbred rats.

Materials and methods. The study was conducted on 30 outbred rats. The animals were divided into control and experimental groups. In the experimental group, alcohol intoxication was modeled by intragastric administration of a 40% ethanol solution at a dose of 7 g/kg body weight for 30 days, and a 5% ethanol solution was provided instead of drinking water. The obtained tissue samples were stained using hematoxylin-eosin and Van Gieson methods and subjected to morphological and morphometric analysis.

Results. The obtained results demonstrated the development of a number of changes in the pancreas under conditions of alcohol intoxication. In the exocrine part, disorganization of acinar structures, loss of clear boundaries, and altered parenchyma-stroma ratios were observed. The acinar diameter decreased from  $30.0 \pm 0.7 \mu\text{m}$  to  $25.0\text{-}27.0 \mu\text{m}$ , and the area decreased from  $900.0 \pm 35.0 \mu\text{m}^2$  to  $700.0\text{-}750.0 \mu\text{m}^2$ . The height of exocrinocytes decreased from  $12.0 \pm 0.4 \mu\text{m}$  to  $9.0\text{-}10.0 \mu\text{m}$ , along with a reduction in their area and number. The nucleus-to-cytoplasm ratio increased from  $0.18 \pm 0.01$  to  $0.20\text{-}0.22$ , indicating a decrease in cellular metabolism and synthetic activity.

An increase in the relative proportion of the stromal component was noted, accompanied by collagen fiber proliferation and the development of fibrosis. Intralobular ducts showed dilation, epithelial hyperplasia, and desquamation.

In the endocrine part, reduction changes were identified. The relative area of the islets of Langerhans decreased from  $2.2 \pm 0.1\%$  to  $1.7\text{-}1.9\%$ .

The number and size of the islets also decreased, with their diameter reducing from  $118.0 \pm 7.0 \mu\text{m}$  to  $95.0\text{-}105.0 \mu\text{m}$ .

The number of endocrinocytes decreased from  $102.0 \pm 4.0$  to  $80.0\text{-}90$ .

Cellular changes included vacuolization, pyknosis, and karyorrhexis, indicating possible impairment of endocrine function.

Conclusions. Experimental alcohol intoxication induces complex morphological and morphometric changes in the pancreas.

In the exocrine part, atrophic and dystrophic processes, disorganization of acinar structures, and fibrosis predominate.

In the endocrine part, reduction of islets and degeneration of endocrinocytes are observed.

These changes are associated with oxidative stress, apoptosis, and necrobiotic processes, leading to decreased functional activity of the pancreas and the development of toxic pancreatopathy.

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