

PANCREATIC PATHOLOGIES: UNDERSTANDING THE INTERPLAY BETWEEN CHRONIC DISEASES AND METABOLIC DYSFUNCTION

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The pancreas has important exocrine and endocrine functions, producing hormones (insulin, glucagon, somatostatin, and pancreatic polypeptide) and a number of extremely powerful digestive enzymes. Therefore, diseases of the pancreas have a significant impact on the body as a whole, resulting in severe complications and a high mortality rate. At the same time, diagnostics are not always successful, which is partly due to the retroperitoneal location of this organ and the vagueness of clinical and biochemical symptoms. The exocrine part of the pancreas is represented by acinar cells that produce digestive enzymes (most of them in the form of proenzymes packed in zymogenic granules) and a system of ducts that remove enzymes into the duodenum. Diseases of the exocrine part of the pancreas include cystic fibrosis, congenital malformations, acute and chronic pancreatitis, and neoplasms [1].

Chronic pancreatitis (CP) is a disease of the pancreas (PG) in which recurrent inflammation leads to the replacement of the gland parenchyma with fibrous tissue, resulting in progressive exocrine and endocrine insufficiency. CP can significantly negatively affect the quality of life, leading to severe complications. The prevalence of pancreatic diseases increases every year, and their social significance is determined by their significant prevalence among the working population, leading to significant losses in both temporary and permanent working capacity, as well as high levels of disability and mortality [2].

Diseases of the digestive system are the fourth leading cause of death in Russia, and the proportion of deaths from them is growing. By 1990, the proportion of deaths was 3%, whereas by 2016, it increased to 3.8% (51.8 cases per 100,000

population). In terms of prevalence in 2016, diseases of the digestive system occupied third place at 9.74%, and among older people, second place at 10.10%. Recently, the incidence and prevalence of pancreatic diseases have increased significantly. The incidence of chronic pancreatitis in European countries is 4-8 cases per 100,000, and the prevalence is around 25 cases per 100,000. According to studies in Russia, the incidence rate of pancreatic pathology in 2012 was 226 cases per 100,000 of the population, with a prevalence of 2471 per 100,000. Primary disability in this type of pathology reaches 15%, ranking second after disability in patients with liver diseases.

Diabetes mellitus (DM) is a chronic metabolic syndrome characterized by prolonged hyperglycemia caused by either insulin secretion disorders, a lack of sensitivity of the cells to insulin, or both. Several reports show that long-term hyperglycemia can lead to serious complications. Moreover, diabetes can exert adverse effects on the male genital system, with complications including erectile dysfunction, male infertility, abnormal spermatogenesis, and oligospermia. The occurrence of testicular injury in male diabetic patients can significantly affect their quality of life. Therefore, the development of appropriate strategies to prevent the loss of testicular germ cells and restore the integrity of testicular tissue structures could present an indispensable approach to preserving or improving the fertility of young or adult male patients [3].

In modern conditions of intensive animal husbandry, many integral components of technological regimes are natural stressors for animals. These include reduced physiological comfort (dense housing, limited movement, physical inactivity), transportation, group formation, and regrouping. Physical inactivity is one of the leading stress factors that negatively affect not only the functional state of all organs and systems but also the productive and reproductive qualities of

animals. In addition, prolonged hypodynamia can lead to a decrease in the animal's resistance, disruptions in metabolic processes, and shifts in the immune system [4].

Diabetes mellitus (DM), or more precisely, hyperglycemia, leads to lesions of the peripheral and central nervous systems. Damage to the central nervous system is determined by both the direct effect of hyperglycemia on cerebral structures and rapid atherosclerotic changes in the brain's blood vessels. Neuropathies and pathological changes in various organs and tissues develop. A number of studies have shown that in experimental diabetes, characterized by absolute or relative insulin deficiency, various metabolic processes become disrupted. This leads, among other things, to the development of vascular pathology. Under the influence of stress, including high altitude, diabetes mellitus decompensates with an increase in counter-insular hormone activity, exacerbating the disease course [5].

The obtained data indicate the absence of gross morphological changes in the structure of the pancreas during acute exposure to tetrachloromethane. In addition, the complex compound of oxymethyluracil with succinic and fumaric acids had virtually no protective effect on the pancreas during toxic damage, and its effect was weaker than that of the drug Heptor [6].

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