

BILE-SYNTHESIZING FUNCTION OF LIVER ON ENTEROPATHOLOGY OF NEWBORN CALVES

V. Tomchuk, V. Gryshchenko
tomchuk_viktor@ukr.net

National University of life and environmental sciences of Ukraine, Kyiv, Ukraine

The presence of a close anatomical and functional connection between the liver and the intestine causes the possibility of simultaneous destruction of these organs caused by the development of diseases of the gastrointestinal tract of newborn calves, which reduces the clinical effect of traditional therapy and leads to complications. The issue of bile-synthesizing function of liver on enteropathology of newborn calves is still insufficiently studied. The purpose of this work was to investigate changes in the bile-acid spectrum of bile and liver in calves caused by the development of neonatal enteropathology.

Experiments were carried out at the Velikosnitynske Training and Research Farm in the Fastovsky District of the Kyiv Region. Black-and-white calves of 2-day age were assigned to two groups: control and experimental, 5 animals in each. The control group included clinically healthy animals. The experimental group included the calves with acute digestive disorders of non-contagious etiology. On the fifth day of life, calves were sampled with bile and liver. The bile acids in the biological material were investigated by thin-layer chromatography (Veselsky S. P., 1991). The content of individual bile acids was determined using a refractometer DO-1 densitometer (λ 620 nm) and calibration graphs. The results of the research were subject to statistical analysis (Kucherenko M. E. et al., 1985).

Due to the chromatographic analysis of extracts from bile and liver tissues of newborn calves, 7 fractions of conjugated and free bile acids were identified. In the bile of diseased calves there are deviations both in the ratio of individual bile acids, and in a significant decrease in their overall content. In particular, the total content of cholates in cystic bile of the calves with enteropathology decreased to 1353.4 ± 88.1 mg%. The concentration of TCA in bile decreased by 38.4 %, TChDxCA + TDxCA by 36.7 %, GCA by 62.7 %, and GChDxCA + GDxCA by 67.6 %. At the same time, the level of free bile acids in bile significantly increased. Thus, the CA content increased by 70.1 %, ChDxCA + DxCA by 69.2 %, and LiCA by 10 times. Increasing the level of free bile acids, together with a significant decrease in concentrations of conjugated taurine and glycine bile acids, caused a significant decrease in the conjugation rate compared to control, indicating inhibition of the biosynthesis and conjugative liver function of sick calves. In the analysis of extracts from liver tissues in calves, there is a significant decrease in the total content of bile acids (by 35.4 %), and in all fractions of conjugated bile acids compared with the control. Among the free bile acids, only the concentration of LHC significantly increased 4 times compared with the control.

In the bile of sick calves, compared to healthy ones, there are differences both in the ratio of individual bile acids, and in a significant decrease in their total content. However, against this backdrop of a decrease in bile acid concentrations conjugated to taurine and glycine, the level of free representatives increased significantly, indicating a decrease in the synthesis and conjugative liver function of diseased calves. In the liver of sick calves, the content of all fractions of conjugated bile acids was significantly lower than control values. Attention is drawn to the fact that the level of free bile acids decreases, but the concentration of toxic LHC increases. The established facts are important to consider when designing therapeutic schemes.

Keywords: NEWBORN CALVES, BILE ACIDS, BILE, LIVER, ENTEROPATHOLOGY