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METABOLIC MARKERS OF CHOLESTATIC SYNDROME IN INFANTS

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Introduction

Cholestatic syndrome (CS) in infants is a condition in which the outflow and/or flow of bile into the intestine is disrupted, leading to the accumulation of conjugated bilirubin and bile acids. Clinically, CHF is manifested by prolonged jaundice after the 14th day of life, acolic (discolored) stools, dark urine, hepatomegaly, itching, and insufficient weight gain. Diagnostic tactics include immediate laboratory confirmation of conjugated hyperbilirubinemia and a primary panel of liver tests: ALT/AST, alkaline phosphatase, GGTP, total/direct bilirubin, bile acids, albumin, PV/INR; at the same time, a general urinalysis, coprology, and a "stool color chart" for acholia screening [1,2].

The purpose of the study

to study the biochemical markers of the diagnosis of cholestatic syndrome in infants

Materials and methods

The study included 70 infants with jaundice, 35 newborns with prolonged neonatal jaundice (main group 1) and 35 young children (comparative group 2) who were hospitalized for cholestasis syndrome in a hospital.

30 healthy newborns (control group 1) and 30 healthy infants (control group 2) were selected for comparative analysis.

Classification and diagnosis were carried out in accordance with the ICD-10 revision and WHO clinical guidelines.

All newborns underwent a general blood test, blood biochemistry with the study of ALT, AST, bilirubin, urea, creatinine, total protein, glucose, calcium, CRP, alkaline phosphatase (ALP) and gamma glutamine trans peptidase (GGTP).

Results and discussion

The study showed that the biochemical status of newborns with prolonged jaundice significantly differs from the indicators of the control group. These children showed a significant decrease in aspartate aminotransferase (AST) levels to 27.8±7.7 u/L versus control values of 42.1±5.7 u/l. The decrease in AST activity can be explained by hyperbilirubinemia and a relative deficiency of vitamin B6, necessary for the functioning of enzyme systems. Such changes are consistent with the data of modern literature, which emphasizes the role of bilirubin load and metabolic imbalance in changing the activity of liver enzymes in newborns.

At the same time, in the blood serum of children with prolonged jaundice, there is a significant increase in the level of total bilirubin — 2.37 times compared with the control (28.1± 5.81 mmol/l), which indicates pronounced violations of bilirubin metabolism. Despite the revealed

changes in AST, the levels of GGTP and alkaline phosphatase in newborns with prolonged jaundice remained within the reference values, however, alkaline phosphatase showed a tendency to increase (181.3±22.8 u/l versus 108.1±6.8 u/l).

A completely different picture was observed in young children with cholestatic syndrome (CS). In this category of patients, a tenfold increase in AST was recorded compared with the control (208.0±52.3 u/l versus 27.5±8.9 u/l), which confirms the presence of cholestasis and pronounced damage to hepatocytes. Additionally, they showed a significant increase in the level of γ-glutamyltranspeptidase (GGTP) — up to 154.7±18.9 u/l versus 13.9±2.4 u/l in healthy children ($p<0.01$). This marker is a highly specific indicator of cholestasis, and its tenfold increase in comparison with the control allows us to consider GGTP as a reliable criterion for the differential diagnosis of cholesterol.

A dynamic assessment of biochemical parameters in children who suffered from prolonged jaundice showed that at an older age (up to 3 years) they have a persistent tendency to increase alkaline phosphatase (ALP): 352.6±53 u/l versus 185.1±5.8 u/l in the control group. This may indicate the ongoing processes of restructuring the liver and bile metabolism and the formation of a predisposition to cholestatic disorders in the future.

Conclusion

Thus, the results obtained confirm the need for careful monitoring of newborns and young children who have suffered from prolonged jaundice, with mandatory examination of bilirubin metabolism and liver enzyme markers. Early detection of abnormalities (AST, GGTP, ALP) allows not only timely differential diagnosis of prolonged jaundice and cholestatic syndrome, but also the formation of risk groups for observation during the first three years of life.

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