In some cases, there may be a moderate increase in serum aminotransferases due to an increase in the permeability of plasma membranes of hepatocytes, however, outside the stage of exacerbation such hyperfermentation does not have a clearly expressed manifestation.

Finally, in some serum samples from the examined animals we found an increase in the activity of a number of indicator of liver enzymes (AST, ALT) and bilirubin (in 1,58-2,75 times) without an inflammatory process from the γ-globulin fraction of the protein spectrum and thymol sample. A similar pattern arises from the disruption of the cell structure and the integrity of the hepatocyte membranes caused by exogenous or endogenous toxic liver damage (mycotoxins, substandard and spoiled feeds, nitrates, nitrites, urea, as well as under-oxidized intermediates − proteinogenic amines, guanidine derivatives, ketone bodies, acetone, acetoacetic, β-hydroxy-butyric acid).

Our studies have shown that hepatopathological conditions that arise in highly productive dairy cattle can be conditionally divided into four biochemical profiles characterized by the following syndromatics:

1. Syndrome of hepatic-cellular insufficiency − a violation of the synthetic function of liver with a decrease in the level of a number of indicators − albumins, glucose, urea, cholesterol, triglycerides.

2. Inflammatory syndrome − an increase in γ-globulins, thymol sample, levels of AST and ALT.

3. Syndrome of cholestasis (excretory-biliary) − an increase in alkaline phosphatase, GGTP, bilirubin, cholesterol.

4. Syndrome of integrity of hepatocytes (cytolysis, impaired permeability of hepatocyte membranes) − an increase in the parameters of ALT, AST, bilirubin.

On the basis of these data, new approaches have been developed to solve diagnostic and pharmacotherapy problems of liver diseases in dairy cattle, including an expert system that allows determining correctly liver pathology based on hepatological profiles and prescribing the most effective treatment, as well as forecast the outcome of treatment of the disease and prevent complications.

DISCUSSION

It should be noted that progress in this direction has been achieved in humane medicine, where a large arsenal of diagnostic methods has been proposed and tested for the study of liver status and the syndrome of diseases has been developed. In veterinary medicine, however, such a principle has not yet been developed. The proposed system of using the most informative indicators that are necessary for diagnosing a particular liver disease, which are grouped into so-called profiles, or biochemical research programs, increases the effectiveness of the integrated approach to diagnosing liver diseases in animals based on the principles of evidence-based medicine.

Another aspect that determines the novelty and innovative essence of the conducted studies is the absence of expert systems for diagnosing liver diseases or the normal state of a sick animal for a combination of proven correlation-dependent parameters with subsequent recommendations for the most effective treatment in veterinary medicine [7, 8].

CONCLUSION

Thus, on the basis of experimental data, biochemical profiles of hepatopathological conditions in dairy cattle have been determined, and an expert system has been developed that allows making timely diagnostics of liver diseases in animals in order to monitor the effectiveness of therapeutic measures and predict the outcome of diseases of the hepatobiliary system. The results of the research will contribute to increasing the efficiency of production of dairy cattle through the development of scientific approaches, methods, economic models, as well as higher return of therapeutic and preventive measures.

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