



## ACTIVITY OF TRANSFERASE ENZYMES OF RATS BLOOD SERUM IN THE DYNAMICS OF EXTRAHEPATIC CHOLESTASIS

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### Annotation

The article analyzes in detail the activity of transferase enzymes in experimental animals in the dynamics of extrahepatic cholestasis.

**Keywords:** cholestasis, experiment, ALT, AST, obstructive jaundice.

### Relevance

Despite numerous studies on the minimally invasive treatment of obstructive jaundice syndrome, practitioners continue to face a large number of problems: the lack of clear indications for the use of various methods of decompression of the biliary tract, the limited necessary technical and material support for minimally invasive interventions and, as a result, little practical experience specialists.

The aim of this study was to evaluate the activity of transferase enzymes in experimental animals in the dynamics of extrahepatic cholestasis.

### Material and Methods

The experiments were carried out on 69 outbred male rats of a mixed population with an initial weight of 180-200 g, kept in a laboratory diet in a vivarium. Extrahepatic cholestasis was reproduced in 37 rats by ligation of the common bile duct. Overall mortality in this group was 32.4%. Sham-operated animals (24 rats) served as controls, which underwent only laparotomy under aseptic conditions. No mortality was observed in these groups. The intact group consisted of 8 rats. The studies were carried out 1, 3, 7 and 15 days after the reproduction of the models. The choice of the timing of the study is associated with the development of significant morphological and functional changes in the liver in experimental cholestasis.

The scheme of experience is presented in table 1.

Determination of the activity of ALT, AST in the blood serum was carried out on a German-made Aytohumalyrer Human biochemical analyzer.





The data obtained were subjected to statistical processing using the Excel-2000 statistical analysis software package with the calculation of the arithmetic mean (M), standard deviation ( $\sigma$ ), standard error (m), relative values (frequency, %), Student's t-test (t) with the calculation error probability (P). At the same time, the existing guidelines for the statistical processing of data from clinical and laboratory studies were followed.

Table 1 Experiment scheme

Series of experiments	Experiment time, days				Total	Lethality, %
	1	3	7	15		
Intact	2	2	2	2	8	-
Control	6/6	6/6	6/6	6/6	24/24	-
Extrahepatic cholestasis	9/6	9/7	9/6	10/6	37/25	32,4

Note: in the numerator, the initial number of animals in groups; the denominator is the number of animals taken for research, taking into account lethality.

## Results of Research

It was found that 1 day after the reproduction of extrahepatic cholestasis, there were no significant changes in ALT activity. However, already after 3 days, the activity of the enzyme increased sharply, exceeding the normative parameters and indicators of the previous study period by 2.69 times. Hyperfermentemia increased even more by the 7th day of the experiment. Its values statistically significantly exceeded the parameters of the previous period by 2.43 and the values of intact rats by 6.89 times. However, by the end of the experiment (15 days after the reproduction of cholestasis), we observed a slight decrease in ALT compared with the previous period (1.68 times). It should be noted that, despite such a decrease, the activity of ALT in the blood serum of experimental animals still significantly exceeded the normative parameters by 4.03 times.



Table 2 Serum transferase enzyme activity experimental animals (M±m)

Groups and terms of the study (days)	ALAT	ASAT
Intact	27,38±1,61	28,88±1,38
Obturation, via:		
1	23,33±0,63 <sup>a,b</sup> 27,83±0,79	70,5±1,65 <sup>a,b</sup> 29,17±1,0
3		
7	75,83±1,83 <sup>a,b</sup> 28,17±0,77	71,83±1,49 <sup>a,b</sup> 30,0±0,94
15		
	184±1,77 <sup>a,b</sup> 26,67±0,071	72,5±1,24 <sup>a,b</sup> 27,67±0,83
	109,5±3,42 <sup>a,b</sup> 27,17±0,65	68±2,0 <sup>a,b</sup> 28,17±0,53

Note: 1. The numerator contains the indicators of the experimental group, the denominator - the control group.

2. Significant difference ( $P < 0.05$ ); a – from the intact group, b – from the control group.

In contrast to ALT, the activity of AST in all periods of the study was significantly statistically significantly higher than in the control group of animals by 2.42; 2.39; 2.62 and 2.41 times.

Thus, in the dynamics of the development of extrahepatic cholestasis, there are significant changes in the blood serum of experimental animals, manifested by hyperenzymemia.

These changes indicate the involvement of the liver in the pathological process, which naturally requires their correction.

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