WEB OF SCIENTIST: INTERNATIONAL SCIENTIFIC RESEARCH JOURNAL
ISSN: 2776-0979, Volume 3, Issue 2, Feb., 2022

CHARACTERISTICS OF PIGMENT METABOLISM OF THE BLOOD SERUM OF RATS IN THE DYNAMICS OF EXPERIMENTAL EXTRAHEPATIC CHOLESTASIS

E.X. Boltaev
Assistant of the Termez Branch of the Tashkent Medical Academy

J.Sh. Surobova
Student of the Termez Branch of the Tashkent Medical Academy

Sh.K. Hakimov
Student of the Tashkent Pediatric Medical Institute

Annotation
The paper analyzes the characteristics of pigment metabolism in the blood serum of rats in the dynamics of experimental extrahepatic cholestasis.

Keywords: cholestasis, obstructive jaundice, modeling, bilirubin, cholesterol.

Relevance

According to the summary data of various authors, there is currently an increase in diseases of the hepatopancreatoduodenal zone, accompanied by a violation of the physiological outflow of bile. The incidence of obstructive jaundice (OM) in these diseases varies from 12.7% to 100% and depends on the nature of the underlying pathology.

The relevance of the breast problem is primarily determined by the persistently high percentage of postoperative complications, reaching 24-54%, as well as high mortality, which ranges from 7.2 to 60%. To date, dynamic pathomorphological changes in the liver that develop with subhepatic cholestasis require a more detailed study. Obtaining such data will make it possible to substantiate indications for the choice of optimal methods for the complex treatment of breast syndrome from new positions, depending on the pathology that caused it.

The aim of this study was to evaluate the pigment metabolism in the blood serum of rats 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 content of cholesterol, total, direct and indirect bilirubin in 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 (σ), 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

According to the literature data, extrahepatic cholestasis is manifested by significant changes in the functional and metabolic parameters of the liver. To assess these changes, we conducted studies of the content of bilirubin and cholesterol in the blood serum of experimental animals (Table 2)

Significant changes were noted in the content of cholesterol in the blood serum. Thus, its level 1 day after the reproduction of extrahepatic cholestasis increased statistically significantly by 1.4 times in relation to the values of the control group of rats. In the future, its content increased even more, exceeding the parameters of the previous period by 1.52 and the values of control animals by 2.07 times. In subsequent periods, the content of total cholesterol in the blood serum gradually decreased.

WEB OF SCIENTIST: INTERNATIONAL SCIENTIFIC RESEARCH JOURNAL
ISSN: 2776-0979, Volume 3, Issue 2, Feb., 2022

However, despite this, its values 7 and 15 days after the reproduction of cholestasis still exceeded the control parameters statistically significantly by 1.64 and 1.2 times, respectively.

One of the manifestations of extrahepatic cholestasis in experimental animals was the development of hyperbilirubinemia. It was manifested by an increase in both total, indirect, and especially direct bilirubin in the blood serum of experimental animals, the severity of which depended on the duration of the experiment. So, 1 day after the reproduction of extrahepatic cholestasis, the level of indirect bilirubin increased to 1.00±0.07 mg/dl, while its value in the control group of animals was 0.67±0.06 mg/dl (table 2). Normally absent direct bilirubin was 1.47±0.05 mg/dL. This led to an increase in the content of total bilirubin up to 2.43±0.06 mg/dl, while its value in the control and intact groups of animals was 0.68±0.02 and 0.57±0.04 mg/dl, respectively. As the duration of cholestasis lengthened, the content of bilirubin and its fractions increased sharply. If the content of total bilirubin after 3 days increased to 8.22 ± 0.09 mg / dl, then indirect - up to 2.67 ± 0.06 mg / dl, and especially direct - up to 5.57 ± 0.08 mg / dl. However, already 7 days after the reproduction of the model, the values of total, indirect and direct bilirubin decreased significantly compared to the previous period of 4.01; 3.47 and 4.13 times, respectively. However, despite this, their values remained high, totaling 2.05±0.05 mg/dl, indirect - 0.77±0.02 mg/dl and direct - 1.35±0.05 mg/dl. If after 15 days of the experiment the level of total bilirubin remained within the values of the previous period, then the parameters of direct bilirubin tended to increase, amounting to 1.75±0.04 mg/dl.

Table 2 The content of bilirubin fractions (mg / dl) and the content of cholesterol in the blood serum of experimental animals

Groups and terms of the study (days)	Bilirubin			Cholesterol
	general	direct	indirect	
Intact	0,57±0,04	-	0,57±0,03	134,75±6,26
Obturation, via:				
1	2,43±0,063 a,b 0,68±0,062	1,36±0,047 a,b --	1,03,462 a,b 0,673±0,062	205,83±2,06 a,b 147,3±1,89
3	8,216±0,1 a,b 0,726±0,053	5,56±0,082 a,b --	2,66±0,16 a,b 0,62±0,046	313,83±10,29 a,b 151,5±1,59
7	2,05±0,053 a,b 0,726±0,053	1,35±0,047 a,b --	0,77±0,025 a,b 0,62±0,046	232,5±6,19 a,b 141,77±1,53
15	2,1±0,06 a,b 0,63±0,044	1,75±0,041 a,b --	0,36±0,01 a,b 0,61±0,03	166,67±11,79 a,b 138,33±1,26

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.

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

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

References

1. Ахмедов К.Х., Эргашов М.А., Худойбердиев С.Э., Имамов Э.Н. Study of the activity of some rat serum enzymes in the dynamics of extrahepatic cholestasis // Узбекский медицинский журнал. 2021 г.
2. Akhmedov K.Kh., Ergashev M.A., Meliboboyev A.N., Boltayev E.H. Hepatic Microhaemocirculation Dynamics in Experimental Extrahepatic Cholestasis // Russian Journal of Gastroenterology, Hepatology, Coloproctology. 2020 y. P-45-50.
3. Axmedov Kamoliddin Xakimovich, Boltayev Eshmamat Xaitovich, Khujamurodova Nafisa Alisherovna, Babaeva Lobarkhon Rustamovna Features of biochemical parameters of blood serum and antioxidant protective control of rats with extrahepatic cholestasis // European Journal of Molecular & Clinical Medicine. 2020 y. P-6142-6146.
4. Ахмедов К.Х. Особенности изменения реологических свойств крови в динамике экспериментального холестаза // Новый день в медицине 2019 г. С. 392-395.
5. Ахмедов К.Х., Ойбекова Д.О., Шагиясова Г.Н. Определение активности ЩФ сыворотки крови крыс с внепечоночном холестазом // Современные научные исследования и разработки. 2018 г. С. 123-124.
6. Ahmedov K.Kh, Khonov A.Sh., Meliboboev A.N., Ismoilov B.Yu. Antioxidant defense in control of rats with extrahepatic cholestasis // Uzbek medical journal. С. 12.
7. Akhmedov K.Kh., Ergashev M.A., Ibragimov A.U. Features of biochemical parameters of blood serum of rats with extrahepatic cholestasis // Uzbek medical journal. P. 6.
8. Борисенко В. Б., Сорокина И. В., Горголь Н. И. Механическая желтуха: патоморфологическая характеристика печени в эксперименте // Світ медицини та біології. 2014. С. 74-78.

9. Зуфаров К.А., Садриддинов А.Ф. Склеротические изменения в печени при эксперименатльном холестазе и их обратимость после восстановления оттока желчи //Бюллетень эксп.биологии и медицины. - 1986. - т.52. - №7. - С.105-108.
10. Yuldashev N.M., Ahmedov K.H., Akbarhodzhaeva H.N., Mirahmedov F.K., Ismailov N. Changes in biochemical indicators of blood serum, characterized the State of the liver, dynamics of experimental extrahepatic cholestasis in rats // Международный журнал экспериментального образования. 2014 г. С. 17-19.