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THE ROLE OF THE ALT ENZYME IN THE UNUSABILITY OF PREPARED DONOR BLOOD

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ABSTRACT

In the Republican Blood Transfusion Center, the blood components that were destroyed due to the high level of ALT enzyme during the last 5 years were analyzed. The results showed that 4% of the blood prepared from donors was discarded because of high ALT enzyme. An increase in the ALT enzyme index is relatively more common in winter and spring than the annual average, and on the contrary, it is less common in summer and autumn.

Keywords : Blood service, unusability of donor blood, disposal of unusable blood, high ALT enzyme.

RELEVANCE OF THE TOPIC

Transfusion of blood components is a highly skilled medical care used in specialized and multidisciplinary hospitals [16]. Hemotransmissible infections, biochemical parameters, chyliosis, hemolysis, and fibrinolysis are evaluated when evaluating the unusability of blood preparations [9].

Hemotransmissible infections include hepatitis V, C and D, acquired immune deficiency, brucellosis, malaria [14, 17]. Despite the fact that in recent years there has been a lot of work devoted to early diagnosis, treatment and prediction of complications of chronic viral hepatitis in the world [3, 5, 7], the importance of some laboratory indicators continues to be discussed in the literature [4, 6], which leads to more perfect examinations for the purpose of early detection of the disease. indicates the need to go.

At the same time, it is mandatory and necessary to use blood components that meet modern quality and safety requirements for blood transfusion therapy. In the last 10 years, the possibilities of clinical transfusion have increased as a result of the increase of new medical technologies [15].

Ensuring the safety of donor blood is inextricably linked with the development of new technologies. In particular, when the level of ALT enzyme was the main indicator to rule out liver disease infection, after the introduction of ELISA methods, the detection of hepatitis V and C played an important role. After the introduction of PCR methods, in many countries of

the world hepatitis V and C were tested by two-step testing method (ELISA or CLIA / PCR) and ALT enzyme detection was abolished [1, 10, 18].

According to scientists, ALT enzyme is a surrogate indicator and shows an old pathological process in the liver, but it does not give accurate information about hemotransmissible infections - V and C viruses [2, 8, 11]. But on the one hand, the fact that the blood service of our Republic has not yet switched to a full two-stage examination system, and the determination of ALT enzyme is one of the standards for testing donor blood, and on the other hand, the relatively large number of viral and other diseases of the liver in our Republic, positive dynamics, does not reduce the diagnostic value of ALT enzyme. In some countries where the ALT enzyme is being tested, it was noted that the dynamics of ALT in donor blood may depend on the seasons [12]. From this point of view, this issue has not been studied in our Republic. We believe that the study of this problem is an urgent issue in our country, where all four seasons pass as in the brochure.

PURPOSE OF WORK

In the Republican Blood Transfusion Center, it consists of the analysis of blood components that have been destroyed due to the high level of the ALT enzyme in the last 5 years.

MATERIALS AND METHODS OF LEARNING

Donor blood for HIV, hepatitis V and C, wound (Diagnosticheskie sistemy test kits of Russia) "Alicei Q.S." in an automatic immunoenzyme analyzer, brucellosis (Russian "Ekolab" test kits) was determined by serological method, ALT (Russian "Ekolab" reagents) and bilirubin (Spanish Spinreact company reagent) in a "Mindray" biochemical analyzer. Donor blood is considered relatively invalid when the ALT index is 0.7-1.3 mmol/l, and absolute invalid when the value is higher than 1.3 mmol/l [13].

THE OBTAINED RESULTS AND THEIR DISCUSSION

Studies have shown that in 2018, a total of 29,140 examinations were conducted, and in 1,714 (5.9%) cases, the level of ALT enzyme in donor blood was high, and the blood was considered unfit (table). In 2019, out of a total of 32,683 examinations, in 1,560 (4.8%) cases, the level of ALT enzyme in donor blood was high, and the blood was considered unfit. In 2020, out of a total of 31,616 examinations, in 1,464 (4.6%) cases, the level of ALT enzyme in donor blood was high, and the blood was considered unfit. In 2021, the number of examinations was 40,239, of which 1,235 (3.1%) cases had a high level of the ALT enzyme in donor blood, and the blood was found to be unfit. found invalid. As can be seen from the results, year by year both the absolute number and the percentage of donor blood invalid according to ALT are decreasing.

To summarize, 6979 cases out of a total of 175,704 examinations for 5 years showed high levels of the ALT enzyme in donor blood (table). This indicates that on average 4% of donated blood is unsuitable for the ALT enzyme. As a quality indicator of the blood service, it is determined that the unusability of prepared donor blood according to the results of laboratory analyzes should not exceed 10%. In addition to ALT enzyme, taking into account HIV, hepatitis V and C, ulcer, brucellosis, 4% higher indicator. Therefore, it is urgent to search for ways to reduce the invalidity of ALT enzyme. For this reason, we studied the dynamics of the ALT enzyme in donor

blood year-by-year, month-by-month and seasonally. In 2018, the highest level of ALT enzyme (annual average of 5.9%) was detected in February (8.0%), May (7.8%), January, April and December (6.8%), and the annual average 35%, 32% and 15% more than the indicator, respectively. 100%, 95% and 70% higher than the 5-year average (5-year average 4.0%), respectively.

In 2019, the highest level of ALT enzyme (annual average of 4.8%) was detected in January (6.9%), February, April and October (from 5.6%), respectively, 43% and 16% above the annual average. % more.72% and 40% higher than the 5-year average, respectively.

In 2020, the highest level of ALT enzyme (annual average of 4.6%) was detected in May and July (from 5.7%), February and June (from 5.6%), respectively, 24% and 22% above the annual average % more. 42% and 40% higher than the 5-year average, respectively.

In 2021, the highest level of ALT enzyme (annual average of 3.1%) was detected in April (3.8%), June and August (from 3.6%), respectively, by 22% and 16% of the annual average is a lot. 5% and 10% less than the 5-year average, respectively.

In 2022, the highest level of ALT enzyme (2.4% of the annual average) was found in April (3.6%), January and May (from 3.3%), 50% and 37% above the annual average, respectively. is a lot. 10% and 17% lower than the 5-year average, respectively.

When ALT enzyme levels were examined on a month-by-month basis, the highest levels were observed in January and April (from 4.8%), February and May (from 4.6%), 20% and 15% higher than the 5-year average, respectively.

When studied in the section of seasons, in the winter season (December, January, February), the indicator is 3.4: 4.8: 4.6%, and the average is 4.3%.

In the spring season (March, April, May) the indicator is 3.8: 4.8: 4.6%, and the average is 4.4%.

In the summer season (June, July, August), the indicator is 4.3: 3.9: 3.5%, and the average is 3.9%.

In the autumn season (September, October, November), the indicator is 3.7: 3.5: 2.9%, and the average is 3.3%.

CONCLUSION

1.4% of donated blood is discarded due to high ALT enzyme. This is a greater indicator than other causes of unfitness of the blood.

2. The obtained results showed that the increase of the ALT enzyme index in blood donors is relatively more common in winter and spring than the annual average, and on the contrary, it is less common in summer and autumn.

3. The state of ALT enzyme index being higher than the norm is more pronounced in January, February, April and May.

Table Absolute and relative invalidity of donor blood according to ALT

Months	Indicators	Years					TOTAL
		2018	2019	2020	2021	2022	
January	General donation	2375	2227	3113	2805	2570	13090
	ALT absol. invalid	79	36	87	59	82	343
	ALT relativ invalid	82	119	52	26	3	282
	failure in percentage	6.8	6.9	4.5	3.0	3.3	4.8
February	General donation	2385	2137	3522	3216	3169	14429

	ALT absol. invalid	68	38	111	68	57	342
	ALT relativ invalid	123	82	87	26	1	319
	failure in percentage	8.0	5.6	5.6	2.9	1.8	4.6
March	General donation	2335	3180	2275	3315	4288	15393
	ALT absol. invalid	83	65	49	92	88	377
	ALT relativ invalid	71	74	36	18	6	205
	failure in percentage	6.6	4.4	3.7	3.3	2.2	3.8
April	General donation	2564	3140	3108	2974	2890	14676
	ALT absol. invalid	93	94	113	102	81	483
	ALT relativ invalid	81	82	27	12	22	224
	failure in percentage	6.8	5.6	4.5	3.8	3.6	4.8
May	General donation	2177	2827	2313	2997	3850	14164
	ALT absol. invalid	107	69	91	80	89	436
	ALT relativ invalid	64	64	42	12	37	219
	failure in percentage	7.8	4.7	5.7	3.0	3.3	4.6
June	General donation	2525	3617	3406	3922	3978	17447
	ALT absol. invalid	104	119	161	127	92	603
	ALT relativ invalid	49	44	31	14	9	147
	failure in percentage	6.0	4.5	5.6	3.6	2.5	4.3
July	General donation	2252	2120	1946	2389	3161	11868
	ALT absol. invalid	71	46	86	80	64	347
	ALT relativ invalid	43	35	26	1	8	113
	failure in percentage	5.0	3.8	5.7	3.4	2.3	3.9
August	General donation	2227	2701	1828	2862	3982	13600
	ALT absol. invalid	42	71	89	97	75	374
	ALT relativ invalid	33	43	9	5	13	103
	failure in percentage	3.4	4.2	5.4	3.6	2.2	3.5
September	General donation	2198	2478	2104	3090	3056	12926
	ALT absol. invalid	57	81	85	95	78	396
	ALT relativ invalid	43	25	8	5	6	87
	failure in percentage	4.5	4.3	4.4	3.2	2.7	3.7
October	General donation	2498	2826	2447	3275	3573	14619
	ALT absol. invalid	56	85	69	82	64	356
	ALT relativ invalid	49	73	18	11	4	155
	failure in percentage	4.2	5.6	3.5	2.8	1.9	3.5
November	General donation	2785	2809	2450	3488	3630	15162
	ALT absol. invalid	55	80	66	82	43	326
	ALT relativ invalid	70	26	11	8	7	122
	failure in percentage	4.5	3.8	3.1	2.6	1.4	2.9
December	General donation	2820	2621	3104	5906	3884	18335
	ALT absol. invalid	91	61	90	125	71	438
	ALT relativ invalid	100	51	20	8	6	185
	failure in percentage	6.8	4.3	3.5	2.6	2.0	3.4
During the year	General donation	29140	32683	31616	40239	42031	175709
	ALT absol. invalid	906	845	1097	1089	884	4821
	ALT relativ invalid	808	715	367	146	122	2158
	failure in percentage	5.9	4.8	4.6	3.1	2.4	4.0

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