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IMPROVEMENT OF DIAGNOSIS METHODS FOR DESTRUCTIVE FORMS OF ACUTE CALCULOSIS CHOLECYSTITIS.

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Abstract:

The diagnostic significance of procalcitonin and lactoferrin in destructive forms of acute calculouscholecystitis has been studied. 91 patients with acute calculouscholecystitis were examined, who were divided into 2 age groups; group I (48) patients under 65 years of age, group 2 (43) patients over 65 years of age. The content of lactoferrin and procalcitonin in blood serum was studied by the method of enzyme immunoassay in ng/ml by commercial test systems of Vector-Best CJSC. A comparative analysis of the dynamic study showed a clear dependence of the concentration of procalcitonin and lactoferrin in the blood with the degree of destructive process in the gallbladder wall, which was more pronounced in patients older than 65 years. The high informative value of studies of the content of procalcitonin and lactoferrin in the blood serum of patients for the diagnosis of destructive forms of acute calculouscholecystitis has been proved.

Keywords: Destructive cholecystitis, lactoferrin, procalcitonin

RELEVANCE.

Cholelithiasis and acute calculous cholecystitis are among the most common diseases of the digestive system (6,8,14,15,16,19). Recently, with the increase in life expectancy of the population, both in our Republic and abroad, the number of patients in need of inpatient treatment with a diagnosis of acute calculous cholecystitis, including elderly and senile patients, is increasing. The analysis of literary sources indicates that in the range from 27.0 to 32.0% of destructive processes in the gallbladder proceed latently and are diagnosed with already developed complications (4.25). Meanwhile, the success of conservative and surgical treatment of patients with destructive forms of cholecystitis depends on the accuracy of timely diagnosis of pathological changes in the gallbladder wall, which determine the tactics of treatment and the urgency of surgical intervention. As is known, for an objective assessment of pathological changes in the gallbladder wall with a high degree of information content, ultrasound and computed tomography are used (1,2,9,20). The main disadvantages of computed tomography diagnostic methods are: undesirable radiation exposure to the patient, the need for specially trained personnel, the laboriousness of the results processing process, the bulkiness and high cost of equipment, and as a result, the high cost of research, the lack of equipment in district clinics and hospitals, where people are most often hospitalized patients with acute calculous cholecystitis (3,5,10,22). The pathogenetic approach to the treatment of acute calculous cholecystitis and its complications requires new and innovative methods for assessing changes in homeostasis in these diseases, allowing to determine the incipient irreversible changes in the gallbladder tissue, leading to its subsequent necrosis and the development of destructive as well as complicated forms of the disease. All of the above indicate the feasibility the use of more accessible diagnostic markers of inflammation indicating the onset of the development of destruction processes in the gallbladder in acute cholecystitis in elderly and senile patients, which in turn will allow a differentiated approach to the choice of a surgical method of treatment (7,11,12,13,17,18 ,21,23,24).

THE PURPOSE OF THE STUDY: optimization of methods for early diagnosis of the onset of the process of destruction in the tissues of the gallbladder in acute calculous cholecystitis.

MATERIAL AND METHODS OF RESEARCH: For this study, after the diagnosis was made, 91 patients with acute calculous cholecystitis were examined, of which 57 were women, 34 were men. Patients were divided into 2 age groups; I-group (48) patients under the age of 65 years, II-group (43) patients over the age of 65 years. As a control, we studied the serum of 15 volunteers aged 50 to 70 years who did not suffer from cholelithiasis and did not have any clinical manifestations of inflammatory processes at the time of the study. Overnight hospitalization from the onset of the disease occurred in 45 (49.45%) patients , and most of them (62.3%) arrived before 12 hours from the onset of the disease. At the same time, the total percentage of late hospitalization (after 12 hours) was

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37.7% in the main group, which could not but affect the frequency of complicated forms of the disease. All patients, upon admission to the hospital and, if necessary, in dynamics, underwent an ultrasound examination of the abdominal organs using Esaote - MyLab™X6" (Italy) or "Mindray M5" (China) devices using convex probes with a frequency of 3.5 MHz, 7 .5 MHz. The state of the liver, gallbladder, extrahepatic bile ducts and pancreas were assessed. According to ultrasound, calculous cholecystitis was detected in 100% of patients. The distribution of patients depending on the form of inflammation - the gallbladder and the presence of extravesical complications showed significant differences in the structure of the pathology in the compared groups. Thus, catarrhal cholecystitis in patients was 3.5 times less common than the incidence of destructive cholecystitis in the absence of extravesical complications. The most common comorbidity was a combination of arterial hypertension and coronary heart disease with diabetes mellitus and obesity. The presence of pathology of two or more organs or systems was noted in 92% of patients of the main group, which could not but affect the characteristics of the clinical course of the underlying disease and the prognosis in patients of various age categories. formula) Among the classical biochemical parameters, the level of protein, prothrombin index, urea, creatinine, bilirubin, alkaline phosphatase, potassium and sodium levels were determined. All studies were carried out upon admission to the hospital, as well as on the 1-3rd day of the postoperative period. All patients, regardless of the severity of the condition, after a short preoperative preparation, urgently underwent surgery, cholecystectomy and drainage of the abdominal cavity. The concentration of lactoferrin and procalcitonin in blood serum was determined by enzyme immunoassay in ng/ml using commercial test systems of CJSC Vector-Best.

RESEARCH RESULTS AND THEIR DISCUSSION:

Morphological studies conducted by us revealed a different ratio of immunocompetent cells in the gallbladder tissue in catarrhal and destructive cholecystitis: phlegmonous and gangrenous. On the basis of morphological features, the difficulty of diagnosing and determining surgical tactics in a short period of time when managing this contingent of patients in a hospital, that is, determining the timing of setting indications for emergency surgery, was revealed. Meanwhile, the analysis of literary sources over the past 5 years has shown that procalcitonin and lactoferrin have proven themselves well in the diagnosis of many destructive conditions, which, according to many researchers, indicate their high diagnostic significance.

As the results of the studies presented in Table 1 show, the dynamics of the content of procalcitonin and lactoferrin in the blood serum has a peculiar character of changes. At the same time, it should be noted that the content of procalcitonin in the blood serum of healthy people is less than 0.1 ng/ml. In patients of the 1st group, with catarrhal form of cholecytitis, the level of procalcitonin was significantly increased several hundred times higher than the control values. This significant increase in the level of procalcitonin can be consistent with the increase in the levels of pro-inflammatory cytokines, which was presented in previous work. Similar dynamics was noted in the indicators of procalcitonin in patients of the 2nd group, but at the same time, this indicator exceeded the initial level by several thousand times. According to some researchers, a sharp increase in the level of procalcitonin in the blood indicates the possibility of developing a septic condition in this group of patients and is an unfavorable prognostic criterion, since in this situation bacterial endotoxins are a stimulator of procalcitonin synthesis. In the destructive form of cholecystitis, the studied indicator also had an increase in in the blood serum of groups 1 and 2 of the examined persons, but at the same time, the identified digital indicators were much higher than those of patients with the catarrhal form of calculous cholecystitis. The revealed indicators of procalcitonin in two groups of patients with different forms of cholecystitis and age indicated the systemic nature of the manifestations of the inflammatory process, which could turn into a pronounced inflammatory and destructive process and end with various severe complications. As can be seen from the presented research results, this clinical condition was sharply expressed in patients 2 groups with destructive forms of cholecystitis.

Table 1

Comparative assessment of the content of procalcitonin and lactoferrin in the blood in patients with destructive forms of acute calculous cholecystitis

Indicators	Control group (n=15)	Patients before surgery	
		I-groups (n =38)	II- groups (n =23)

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Procalcitonin ng/ml	0,005±0,0001	CCH	0,123±0,01*	3,08±0,26*
		DCH	1,012±0,08*	8,08±0,67*
lactoferrin ng/ml	253,71±16,84	CCH	414,56±16,73	1618,79±19,78*
		DCH	2173,14±19,56*	2968,79±31,83*

Note: *- reliability of differences (P<0.05),

catarrhal cholecystitis (CCH),

destructive cholecystitis (DCH, OHC)

We also conducted a study of the level of lactoferrin in the serum of patients with acute cholecystitis of varying severity and patients of various ages, which showed a clear dependence of the concentration of lactoferrin on the degree of destruction in the gallbladder wall. As is known, lactoferrin is involved in the retention of neutrophils in the inflammatory focus (2,11). With an excessively long persistence of the neutrophilic phase, there is a real threat of purulent fusion of the tissue and the development of abscesses. In addition, lactoferrin binds lipopolysaccharides (LPS) of bacterial walls, and the oxidized form of iron, which is part of the protein, initiates their peroxidation. This leads to a change in membrane permeability and subsequent cell lysis (12,13,17).

As can be seen from the results of the studies presented in Table 1, the content of lactoferrin in the blood serum had a peculiar character depending on the severity of the disease and the age of the patients. Thus, in patients of the 1st group with catarrhal cholecystitis, upon admission to the hospital, an increase in the level of lactoferrin by 1.6 times was noted, while in patients of the 2nd group it exceeded the control values of healthy individuals by 6.4 times. It should be noted that in the destructive form of cholecystitis, the levels of lactoferrin in the blood serum were at higher values compared to the control values. Thus, in patients of group 1, it exceeded the baseline by 8.6 times, while in patients of group 2, by 11.8 times. monocytes - macrophages. Recently, a number of agents have been discovered that can stimulate the expression of the LF gene, including bacterial lipopolysaccharides (LPS). Consequently, high values of lactoferrin in the examined patients, especially in the destructive form of the disease, are accompanied by a change in cellular phases in the focus of inflammation, where the persistence of the neutrophilic phase leads to tissue destruction and purulent fusion.

Therefore, success in the treatment of patients with acute calculous cholecystitis depends on the accuracy of timely diagnosis of the onset of pathological changes in the gallbladder wall, which determine the tactics of treatment and the urgency of performing surgical intervention.

The choice of surgical aid in this situation, apparently, should be determined primarily by its effect on the body and, in particular, on the initial systemic disorders. In this regard, our further studies were aimed at assessing the identified deviations of the studied blood parameters depending on the statute of limitations of the surgical intervention. The analysis of the obtained research results showed that after primary cholecystectomy, the existing initial disorders on the first day after the operation were aggravated, especially in patients of the 2nd group.

World Bulletin of Public Health (WBPH)
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Table 2
Comparative assessment of the content of procalcitonin and lactoferrin in the blood of patients with destructive forms of acute calculous cholecystitis before and after surgery for 1 day

Indicators		I-groups (n =38)		II- groups (n =23)	
		1 day after surgery			
		before	after	before	after
Procalcitonin ng/ml	CCH	0,123±0,01	0,178±0,02	3,08±0,26	5,12±0,41*
	DCH	1,012±0,08	1,164±0,15	8,08±0,67	13,51±1,18*
lactoferrin ng/ml	CCH	414,61±12,73	509,56±14,52	1618,79±14,96	1802,34±17,43
	DCH	2173,12±17,56	2373,14±19,14	2968,53±21,83	3209,81±24,52

Note: *- reliability of differences P<0.05, catarrhal cholecystitis (CCH), destructive cholecystitis (DCH, WHC)

At the same time, the level of procalcitonin in the blood on the 1st day after surgery in patients of the 1st group with various forms of the disease slightly increases. In the second group of patients, the values of procalcitonin increased significantly. So, if before the operation the level of procalcitonin in the blood in patients with catarrhal cholecystitis was equal to 3.08±0.26 ng/ml, then a day later, it was equal to 5.12±0.41 ng/ml. In patients of group 2 with a destructive form of cholecystitis, the studied indicator was also higher than the initial values relative to preoperative indicators by 65.7%.

A more pronounced dynamics was noted in relation to the indicators of lactoferrin in the blood of the examined patients. So, if in patients of the 1st group the studied indicator with catarrhal cholecystitis exceeded the initial values by an average of 23%, then with destructive forms it increased by only 9% relative to the initial values. In patients of group 2, the level of lactoferrin in the blood of patients with a catarrhal form of the disease was higher than the initial figures by an average of 12%, in patients with a destructive form - by 8%.

On the 3rd day of the postoperative period, stabilization was noted in the majority of patients in group 1 of patients, on average, in 78%, while in patients of group 2, in 47% of patients. Conducted biochemical blood tests in examined patients with various forms of the disease showed that in patients of the 1st group, with catarrhal cholecystitis, there is a decrease in the level of procalcitonin in the blood by 1.3 times, in patients with a destructive form of the disease by 3.6 times. In patients of the 2nd group, a peculiar picture was observed due to the age of the patients. Thus, the level of procalcitonin in patients with catarrhal cholecystitis decreased by 29%, while in patients with a destructive form of the disease by 2 times.

Table 3
Comparative assessment of the content of procalcitonin and lactoferrin in the blood in patients with destructive forms of acute calculous cholecystitis before and after surgery on the 3rd day

Indicators		I-groups (n =38)		II- groups (n =23)	
		3 day after surgery			
		before	after	before	after
Procalcitonin ng/ml	CCH	0,123±0,01	0,098±0,02*	3,08±0,26	2,19±0,21*
	ДСН	1,012±0,08	0,278±0,03*	8,08±0,67	4,02±0,37*
lactoferrin ng/ml	CCh	414,42±12,73	303,56±11,68	1618,79±14,96	519,27±13,69*
	ДCh	2173,02±19,56	619,14±14,56	2968,79±21,83	885,14±17,13

World Bulletin of Public Health (WBPH)
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Note: *- reliability of differences (P<0.05),
catarrhal cholecystitis (CCH),
destructive cholecystitis (OFC, OHC)

As can be seen from the presented research results (table 3), the dynamics of lactoferrin in the blood of the examined patients on the 3rd day after the operation had a peculiar character. Thus, in patients of the 1st group with catarrhal cholecystitis, a decrease in the level of lactoferrin by 27% from the initial values was noted, while in patients with a destructive form of the disease, it decreased by 3.5 times relative to preoperative indicators. In patients of group 2 with catarrhal cholecystitis, the level of lactoferrin on the 3rd day after surgery decreased by 3.1 times. Similar dynamics was observed in patients with destructive cholecystitis, where the studied indicator was 3.4 times lower than preoperative values. Thus, the obtained research results indicate that there is a clear dependence of the concentration of procalcitonin and lactoferrin in the blood on the degree of development of the destruction process in the tissues of the gallbladder, which is more pronounced in patients of the 2nd group relative to the indicators of lactoferrin in the blood.

CONCLUSION

1. The severity of clinical and laboratory manifestations of acute calculous cholecystitis is directly proportional to the degree of morphological changes in the wall of the gallbladder, where the most pronounced course is observed in destructive cholecystitis.
2. It should be noted that in elderly patients, acute calculous cholecystitis proceeds with more pronounced results of laboratory parameters, which is due to a decrease in the overall reactivity of the body, the presence of concomitant diseases. Therefore, in order to resolve the issue of surgical intervention, all patients with acute calculous cholecystitis need to conduct a laboratory study, where the most informative method for early diagnosis of the onset of development and a marker of destruction in the gallbladder wall is high levels of procalcitonin and lactoferrin in blood serum.

LIST OF USED LITERATURE

1. Адамян А.И., Гуляев А.А., Иванина Т.А. и др. Острофазный ответ и белки плазмы крови при остром холецистите. Клин.лаб. диагностика. - 1997. - №11. - С.8-10;
2. Алешкин В.А., Новикова Л.И., Лютов А.Г. и др. Белки острой фазы и их клиническое значение. Клин.мед. - 1988. - №8. - С.39-48;
3. Алешина Г.М., Кокряков В.Н., Шамова О.В., Орлов Д.С., Андреева Ю.В. Современная концепция об антимикробных пептидах как молекулярных факторах иммунитета. *Медицинский академический журнал.* 2010; (4): 149-160.
4. Бокерия Л.А., Голухова Е.З., Чичкова М.А. Острофазовые маркеры патологического процесса в прогнозировании характера клинического течения экссудативного перикардита после кардиохирургических вмешательств. Соврем.медицина: теория и практика. - 2004. - №4. - С.2-8
5. Белая О.Л., Фомина И.Г., Байдер Л.М. и др. Влияние биофлавоноида диквертина на антиоксидантную систему церулоплазмин/трансферрин и перекисное окисление липидов у больных стабильными формами ишемической болезни сердца с дислипидемией. Клин.мед. - 2006.- №7. - С.46-50
6. Борисов А.Е., Земляной В.П., Левин Л.А. и др. Современное состояние проблемы лечения острого холецистита // Вестник хирургии им. Грекова. 2001. Т.160, №6. С.92-95
7. Баратова М. С., Атаева М. А., Худойдодова С. Г. Допплерграфия в диагностики нарушений функции миокарда левого желудочка после перенесенных инфекционных состояний //Tibbiyotda yangi kun. – 2017. – №. 4. – С. 84-87.
8. Кузнецов Н.А., Аронов Л.С, Харитонов С.В. и др. Выбор тактики, сроков и метода проведения операции при остром холецистите // Хирургия. 2003. №5. С.35-40
9. Кчибеков Э.А., Никулина Д.М, Коханов А.В., Кутуков В.Е. Острофазовые белки в диагностике острого холецистита. //Материалы 79-й итоговой научно-практической конференции сотрудников академии, врачей города и области по актуальным проблемам медицинской науки и биологии. - Астрахань, 2002. - С. 70-74
10. Кчибеков Э.А., Оганесян А.А., Никулина Д.М., Кутуков В.Е., Кривенцев Ю.А. Мониторинг острофазовых белков при

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-9, April 2022
ISSN: 2749-3644

холециститах //Материалы научно-практической конференции и школы-семинара для молодых ученых с международным участием. «Современные достижения фундаментальных наук в решении актуальных проблем медицины». - Астрахань-Москва, 2004.-С. 106-109

11. Baratova M. S. et al. Periodontal diseases in military age persons and arterial hypertension //Asian Journal of Multidimensional Research (AJMR). – 2020. – Т. 9. – №. 4. – С. 111-113.
12. Ахмедов А. Т. Особенности иммунной системы при врожденных пороков сердца //european journal of modern medicine and practice. – 2022. – Т. 2. – №. 3. – С. 35-40.
13. Получение рекомбинантного лактоферрина человека из молока коз-продуцентов и его физиологические эффекты / В. С. Лукашевич [и др.] // Доклады НАН Беларуси. 2016. - Т. 60, №1. - С.72-81.
14. Хамдамов Б.З., Давлатов С.С., Хайдаров Ф.Н., Хамдамов И.Б. Оптимизация хирургического лечения острого калькулёзного холецистита, осложнённого гнойным холангитом. Доктор ахборотномаси 2021, № 3, -С.116-119. DOI: 10.38095/2181-466X-20211003-116-119
15. Хамдамов Б.З., Мирходжаев И.А., Хайдаров Ф.Н., Хамдамов И.Б. Дифференцированный подход в хирургическом лечении острого калькулёзного холецистита осложнённого гнойным холангитом. Вестник ТМА №4,2021.-С.-167-169
16. Хайдаров Ф.Н., Хамдамов Б.З., Хамдамов И.Б. Дифференцированный подход в хирургическом лечении острого калькулёзного холецистита осложнённого гнойным холангитом/TheXVII InternationalScienceConference «Currenttrendsinthedevelopmentofscienceand practice», June 07 – 09, **Haifa, Israel.**EuropeanConference (https://eu-conf.com/). – С. 100-103.
17. Alexander D., Iigo M., Yamauchi K., Suzui M., Tsuda H. Lactoferrin: an alternative view of its role in human biological fluids. *Bio- chem. Cell Biol.* 2012; 90 (3): 279-306.
18. Al-Delaimy, W.K., Jansen, E.H. Reliability of biomarkers of iron status, blood lipids, oxidative stress, vitamin D, C-reactive protein and fructosamine in two Dutch cohorts. - Biomarkers. - 2006. - 11(4):370-382).
19. Kimura, Y., Takada, T.,Kawarada, Y. et al.: Definition, pathophysiology, and epidemiology of cholangitis and cholecystitis. // J HepatobiliaryPancreatSurg (2007) 14:15-26).
20. Kanwar J.R., Roy K., Patel Y., Zhou S.-F. et al. Multifunctional iron bound lactoferrin and nanomedicinal approaches to enhance its bioactive functions. *Molecules.* 2015; 20: 9703-31.
21. Recombinant human lactoferrin from transgenic goats: isolation and physicochemical properties / I. Semak [et al.] // The Xth International Conference on Lactoferrin, Structure, Function and applications, 08-12 May, 2011. - Mazatlan, Mexico. P-VI-6. - P. 74.
22. Recombinant human lactoferrin expressed in transgenic goats / A. Budzevich [et al.] // The Xth International Conference on Lactoferrin, Structure, Function and applications, 08-12 May, 2011. - Mazatlan, Mexico. O-VI-2. - P. 66.
23. Djumayevich N. F. Macro-Microscopic Anatomy and Reactive Changes in the Testimonal Appendices under Exposure to Magnesium Chlorate in Postnatal Ontogenesis //International Journal of Innovative Analyses and Emerging Technology. – 2021. – Т. 1. – №. 6. – С. 152-155.
24. Jumaevich N. F. Comparative characteristics of testicular appendages in normal conditions and when exposed to a biostimulator against the background of radiation sickness //International journal for innovative engineering and management research, 2021й. – С. 28-30.
25. Hamdamov B. Z., Musoev T. Y., Khaidarov F. N., Gaziev K. U. Dynamics of cytokine blood profile at destructive forms of acute calculouscholecystitis /Europe's Journal of Psychology 2021, Vol. 17(3), 93-101 https://doi.org/10.5978/ejop.5453