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SIGNIFICANCE OF CYTOKINES IN THE DEVELOPMENT OF LIVER DISEASES

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Abstract
"The role of the cytokines in chronic liver disease"
Various cytokines play a huge role in the regulation of fibrogenesis. Cytokines are low molecular weight proteins that are produced and secreted mainly by activated cells of the immune system and are involved in the development of immune responses according to the cellular or humoral type. Produced transiently, they have a short half-life and act at very low concentrations by binding to high affinity receptors on the surface of target cells.

Keywords: Chronic liver diseases, immune inflammatory response, damage to hepatocytes, therapy.

Introduction

Chronic liver diseases are one of the main and complex problems of gastroenterology. Liver pathology is widespread and is considered one of the main health issues worldwide. Over the past 20 years, there has been a significant increase in liver diseases. In the Commonwealth of Independent States, 500 to 1 million people get sick with various liver diseases each year. By now, the number of people suffering from liver diseases in the world has reached 2 billion. Every year, 2-3 million people are registered with viral, toxic, alcoholic or autoimmune diseases. This, in turn, is explained by the role of the liver in internal and external detoxification, the metabolism of most drugs in the liver, and the intensive metabolism of proteins, fats and carbohydrates in the liver. Some diseases leave a long-lasting "metabolic footprint" when they heal. Also, alcohol and viral liver diseases are of great importance in liver diseases becoming chronic and later developing and causing liver cirrhosis and hepatocellular carcinoma.

Today, scientists are studying the importance of the cytokine system in chronic liver diseases, the relationship of this system with other regulatory systems of the body [1]. It is known that the activity of the immune system is controlled by genetic control, so it is possible to think that the development of viral infections or chronic hepatitis depends on immunogenetic mechanisms [2,3,4]. For this reason, it is suggested that some individuals are resistant to virus infection, and some are prone to infection [5,6]. To date, it has been proven that HCV and HBV viruses do not have a direct

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hepatotoxic effect, but there is a correlation between liver tissue damage caused by immune inflammation and the acceleration of liver fibrosis [7,8].

Under physiological conditions, cytokines act to control Ito cells, i.e., liver fibroblasts, which play a key role in organ fibrogenesis. In addition to the production of profibrotic factors, mast cells also produce antifibrotic factors to maintain this balance. Antifibrotic factors include metalloproteases such as collagenase, gelatinase, and storomolysin. In turn, the activity of metalloproteases is reduced by inhibitors produced by Ito cells. Regardless of the etiology of liver damage, large amounts of cytokines such as interleukin-1 and FNO-α are released. These cytokines in turn activate Ito cells and cause Ito cells to produce thrombo-activating factor (PDGF) and transforming growth factor (TGF-β1), which are important in the pathogenesis and progression of the disease. Transforming growth factor is a group of cytokines that activates regenerative processes, increases the production of collagen and cellular matrix, and transforms Ito cells into fibroblasts. Collagenogenesis in the space of Disse is accompanied by derailment of blood circulation in the sinusoids and necrosis of hepatocytes. Recently, the importance of cytokines in the complications of liver cirrhosis, such as portal hypertension, liver encephalopathy, bleeding from varicose veins of the esophagus, failure of multiple orgas, has been studied. As a result of the increased permeability of the intestinal wall of gram-positive bacteria, it has been proven that the number of inflammatory cytokines increases in patients with cirrhosis of the liver under the influence of endotoxins that enter the general blood circulation system. It is known that under normal physiological conditions, endotoxins of gram-negative bacteria of the intestine are neutralized by Kupffer cells after entering the general blood circulation system. Endotoxin leads to increased oxidation of lipids and free radicals, as well as increased FNO-α content, increased necrosis and inflammatory cell infiltration, resulting in increased apoptosis. An increase in the amount of FNO-α causes an increase in the number of interleukins, such as IL-1, IL-6, IL-8, which cause hepatocyte necrosis, apoptosis and fibrogenesis. As a result of studies by some authors, FNO-α has been proven to cause portal hypertension in experimental mice. FNO-α and IL-8 together participate in the production of reactive oxygen species and nitric oxide, causing damage to various organs and tissues and eventually failure of multiple organs. Recent studies have shown that increased serum levels of inflammatory cytokines such as FNO-α, IL-1, IL-6, and decreased levels of anti-inflammatory cytokines such as IL-4 and IL-10 are associated with portal hypertension, hepatic encephalopathy, ascites, ascites-peritonitis. causes such complications [9].

Thus, inflammation and anti-inflammatory cytokines are out of balance in liver cirrhosis. Inflammatory cytokines are important in the pathogenesis of liver cirrhosis decompensation and complications such as portal hypertension, ascites, hepatic encephalopathy and liver failure.

References:

1. Астахин А. В., и соавт. Роль цитокинов и интерферона α в патогенезе хронических диффузных заболеваний печени. А. В. Астахин и соавт. Вестник РАМН, 2004, № 4, С. 19–23.
2. Покровский В. И. Хронический гепатит С: современные представления о пато- и морфогенезе. концепция антивирусной стратегии гепатоцитов. Бюллетень экспериментальной биологии и медицины. 2003, Т. 135, № 4, С. 364–3 76.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

3. Ярилин А. А. Система цитокинов и принципы ее функционирования в норме и при патологии. Иммунология. 1997, № 5, С. 7–14.
4. Белобородова Э. И., Абдрашитов Р. Ф., Белобородова Е. В., Бурковская, В.А. и соавт. Диагностическая ценность определения сывороточных маркеров фиброза печени при хроническом вирусном гепатите. Клиническая медицина. 2007, № 9, С. 61–63.
5. Абдукадырова М. А. Прогностические маркеры хронизации вирусного гепатита С. Иммунология. 2002, № 1, С. 47–50.
6. Абдурахманов, Д. Т. Вирус гепатита В в патологии человека. Клиническая фармакология и терапия. 2002, № 1, С. 48–56.
7. Рачковский М. И., Черногорюк Г. Э., Белобородова Э. И., Белобородова Е. В. и соавт. Оценка прогностической роли альфа-фетопротеина при циррозе печени: результаты 3-летнего наблюдения. Современные проблемы науки и образования. 2013, № 5, С. 303–3 04.
8. Рачковский М. И., Черногорюк Г. Э., Белобородова Э. И., Белобородова Е. В. и соавт. Оценка прогностической роли альфа-фетопротеина при циррозе печени: результаты 3-летнего наблюдения. Современные проблемы науки и образования. 2013, № 5, С. 303–3 04.
9. Li X., Geng M., Peng Y., Meng L., Lu S. Molecular immune pathogenesis and diagnosis of COVID-19. J Pharm Anal 2020;10(2):102–8.
10. Зокирхўжаев, Ш. Я., & Паттахова, М. Х. (2022). Clinical Features and Lab Values of Patients with Chronic Hepatitis after Covid-19.

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