PATHOGENETIC ASPECTS OF VIROLOGICAL VARIANTS OF CHRONIC HEPATITIS C

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Relevance

It has now been established that with viral hepatitis, incl. and with Chronic viral hepatitis C (CHC), a universal mechanism of hepatocyte death develops through the increased production of reactive oxygen species, causing excessive lipid peroxidation of membrane structures (Glushkov S.I., 2016; Aripov O.A., 2018.). In this case, the main function of protection is when lipid peroxidation (LPO) is activated, the antioxidant defense system (AOD) of cells is performed, the deficiency of which becomes one of the factors for the activation of pro-oxidant systems. An important point in the effectiveness of AOP is the balance of SOD and catalase. A decrease in the activity of one of the AOP enzymes can lead to excessive accumulation of reactive oxygen species and membrane damage. An imbalance in the activity of the LPO and AOP systems is the basis for the onset of cellular destruction [Bueverov A.O. 2012].

The purpose of the research

The purpose of the study was to study the state of the prooxidant and antioxidant system in various types of CHC.

Research materials

48 patients with CHC from 20 to 50 years old and 20 practically healthy people with no markers of hepatitis were examined. The clinical diagnosis was made on the basis of anamnesis, results of clinical and laboratory examination, and the presence of anti-HCV (ELISA) and HCV RNA (PCR) in the patient. All patients were divided into three groups according to the registered genotypes of the C virus. Group I – genotypes 1a-1b – 27 patients, group II – genotypes 2a-2b – 9 patients, and group III 3a – 12 patients.

The pro-oxidant system was studied by the content of both the primary LPO product – diene ketones and conjugates (DC) (Gavrilova V.B. et al., 2014), and the secondary – malondialdehyde (MDA) (L.I. Andreevoy et al., 2018).

The state of antioxidant protection was determined by the activity of SOD and catalase. SOD activity was determined according to the method of Mkhitryan V.G. et al. (1978), and catalase activity – according to the method of Koralik M.A. et al. (1998). The research results were processed using the Statistica 6.0 Microsoft software package and using the Student's t-test.

Research results

Analysis of the results obtained showed that the pro-oxidant system is activated in the examined patients. Thus, significantly high indicators of the primary products of lipid peroxidation – diene ketones (0.32±0.03 and 0.67±0.06 units/ml, respectively) are noted in relation to the control) and diene conjugates (1.07±0.06 and 1.86±0.12 units/ml, respectively), and secondary – MDA (2.50±0.05 and 3.76±0.44 nmol/l). Changes in the components of the AOD system, in contrast to the pro-oxidant system, are multidirectional. Thus, if the activity of catalase increased, then the activity of SOD did not differ significantly from the control indicators. Noteworthy are the features of changes in SOD activity in groups of patients with different genotypes of the virus. In patients with genotypes 1a-1b, SOD activity significantly increased, in genotypes 2a-2c it significantly decreased, and in groups of patients with genotype 3a, SOD activity did not differ from control indicators. At the same time, there were no significant differences in other studied indicators between groups with different genotypes of the C virus.

Discussion of the results obtained

Analysis of indicators of lipid peroxidation processes revealed a significant increase in the content of both the primary products of lipid peroxidation, DC and the secondary product, MDA, in all examined patients compared to the control. According to E.A. Beloborodova et al., (2005) increased MDA activity and DC content are interrelated with the morphological activity of chronic hepatitis.

Conclusion

1. In patients with CHC, there is an increase in the levels of lipid peroxidation products – diene ketones, diene conjugates, and MDA and multidirectional changes in the components of AOP – catalase, SOD.

2. In patients with CHC, changes in SOD activity are associated with the genotype of the virus.