



THE EFFECT OF BACTERIAL ENDOTOXINS ON THE LEVEL OF ALANINE AMINOTRANSFERASE AND ASPARTATE AMINOTRANSFERASE IN THE BLOOD

Ergasheva M.Zh.

Elmurodov L.K.

Center for Pharmaceutical Product Safety, Tashkent city, Republic of Uzbekistan

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Bacterial endotoxins, also known as polysaccharides (LPS), are known to be the main component of the outer membrane of gram-negative bacteria. Bacterial endotoxins are present in the bloodstream throughout life and participate in the regulation of immune system activity at all levels. Lipopolysaccharides enable the adaptation of the immune and other vital body systems to constantly changing external and internal environmental conditions. However, excessive bacterial endotoxins entering the bloodstream can cause the development of endotoxin aggression and endotoxin shock, or acute multiple organ failure syndrome. It has been shown that damage to liver parenchymal cells begins with membrane disruption resulting from lipopolysaccharide activation of the arachidonic acid cascade. It has also been shown that 3 hours after intravenous administration of bacterial endotoxins, the number of lysosomes within parenchymal cells localized around the bile ducts increases.

The aim of the study was to investigate the effect of introducing bacterial endotoxins into the body on the activity of alanine aminotransferase and aspartate aminotransferase in the blood of experimental animals.

Materials and methods: The study was conducted on white mongrel rats. The animals were divided into two groups. The first group was a control group, and the second consisted of animals injected with bacterial endotoxins. Seven days after the bacterial endotoxin administration, alanine aminotransferase and aspartate aminotransferase levels were measured in the blood. Enzyme activity was determined using a commercial reagent kit designed to measure the activity of these enzymes in the blood.

Results: The study results showed that in the group of animals administered bacterial endotoxins, the activity of alanine aminotransferase and aspartate aminotransferase in the blood increased. The increased levels of these enzymes in the blood may be due to increased cytolysis in the liver. Cytolysis is a nonspecific response of liver cells to damaging factors. During cytolysis at the cellular level, the integrity of hepatocyte membranes is disrupted, leading to the release of their contents, including enzymes, into the blood. It is possible that excessive bacterial endotoxins damage liver cells, resulting in increased enzyme levels in the blood. Bacterial endotoxins consist of a hydrophilic polysaccharide residue covalently linked to a hydrophobic lipid residue (lipid A). Lipid A is the most conserved part of the endotoxin and is responsible for most of its biological properties, including its biological toxicity. It is possible that under the influence of Lipid A endotoxin, the destruction of liver membranes occurs, resulting in the release of enzyme contents into the blood.

Conclusions : Based on the data obtained, it can be concluded that elevated levels of bacterial endotoxins in the blood may be a cause of liver pathologies. Increased lipopolysaccharide levels in the intestinal lumen are known to occur as a result of the destruction of gram-negative bacteria by antibacterial drugs, food poisoning, dysbacteriosis, and other conditions. It is possible that intestinal bacterial endotoxins, when absorbed into the blood, may contribute to the development of a number of diseases, including liver disease.