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PROGNOSTIC VALUE OF SUBSTANCES PRODUCED BY LEUKOCYTES IN PERITONITIS

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When bacterial endotoxins stimulate the manufacture of Macrophage Inflammatory Protein (MIP-1β), it activates polymorphonuclear neutrophils and has chemotactic and proinflammatory effects [Lesińska M., 2014]. MIP-1β levels are considerably greater in ascitic fluid (specificity: 100%) than in serum (specificity: 35%) in patients with spontaneous bacterial peritonitis, suggesting that peritoneal macrophages are the primary source of MIP-1b production [Khorshed S., 2015]. In patients with spontaneous bacterial peritonitis, measuring the quantity of MIP-1β in ascitic fluid may therefore be a helpful diagnostic and prognostic indicator. Moreover, homocysteine, a sulfur-containing amino acid that is an intermediate product of methionine metabolism in humans, can be detected in ascitic fluid and serum as a sign of spontaneous bacterial peritonitis [Moiseev S.V. et al., 2022].

Particular focus should be paid to the investigation of neutrophil gelatinase-associated lipocalin (NGAL) synthesis. This protein is released by neutrophils during activation and is present in particular neutrophil granules that express both NGAL and neutrophil gelatinase B (matrix metalloproteinase 9, MMP-9). Lipocalin is distinguished by its capacity to bind particular cell surface receptors and tiny hydrophobic compounds like retinol. The development of peritonitis is significantly influenced by peritoneal NGAL, which increases in response to infection and has a bacteriostatic impact [Moiseev S.V. et al., 2022], Fig. 6.2. Peritoneal mesotheliocytes enhance its synthesis [Virzi G.M., 2024]. Because NGAL affects the progression of inflammation in the abdominal cavity, its roles go beyond being a biomarker.

When consumed, gram-negative bacteria (such S. typhimurium) cause an immunological response that is typified by the activation of antigen-presenting cells (macrophages and dendritic cells). T lymphocytes are activated when these cells release the cytokines IL-18 and IL-23. IL-17 and IL-22, which act on intestinal cells and promote the de novo synthesis of lipocalin 2 (Lcn2), are produced by activated T cells. Lcn2 attaches to bacterial iron-binding proteins (siderophores), such enterocholine, after being secreted into the intestinal lumen. The sequestration of bacterial siderophores by Lcn2 has a bacteriostatic effect since iron is necessary for bacterial growth. The length and severity of postoperative peritonitis are indicated by levels of fibrinopeptide A, complement component C3a, and proteinase elastase inhibitor complex α-1. In the initial hours following surgery, there is a noticeable rise in these levels. Additionally, preoperative and postoperative values of all three measures show a substantial association [Ulrich Schödel, 1989].

Patients with peritonitis can be stratified according to the prognosis of their illness and appropriate treatment decisions can be made by examining biomarker levels in their blood and peritoneal fluid. However, medical views should be based on both the results of peritonitis marker tests and other clinical and laboratory data because to methodological limitations and high heterogeneity in studies.