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MODERN ASPECTS OF PERIODONTAL TISSUE CONDITIONS IN PATIENTS WITH LIVER DISEASES AND AFTER LIVER TRANSPLANTATION (LITERATURE REVIEW)

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Abstract

This literature review presents current data on the relationship between inflammatory periodontal diseases and chronic liver diseases, including the post-liver transplantation condition. Key pathogenetic mechanisms are discussed, including systemic inflammation, immune dysregulation, and dysbiotic changes in the oral microbiota. Clinical features of periodontitis in patients with liver pathology and transplant recipients are analyzed. The role of oral health status as an important prognostic factor and the need for an interdisciplinary approach to patient management are substantiated.

In Republic of Uzbekistan, the problem of chronic liver diseases remains highly relevant due to the high prevalence of viral hepatitis and metabolic disorders. National researchers also report a significant impact of systemic pathology on periodontal tissue conditions (Khamidov A.A., Yusupov Sh.Sh., 2019).

Keywords: Periodontitis; liver diseases; liver transplantation; immunosuppression; microbiota; systemic inflammation; dysbiosis.

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Introduction

Inflammatory periodontal diseases remain among the most prevalent chronic conditions, affecting up to 80–90% of the adult population (Tonetti M.S., Jepsen S., Jin L., Otomo-Corgel J., 2017). Current concepts define periodontitis as a chronic immune-inflammatory disease in which dysregulation of the host immune response to the microbial biofilm plays a key role.

In recent years, the association between periodontitis and systemic diseases, including liver pathologies, has been actively investigated. The liver performs essential functions in immune regulation, metabolism, and detoxification; therefore, its dysfunction leads to systemic inflammation and immune impairment (Schwabe R.F., Tabas I., Pajvani U.B., 2020).

The increasing prevalence of chronic liver diseases and the growing number of liver transplantations, including in Republic of Uzbekistan, highlight the need for comprehensive investigation of dental aspects of this pathology.

Chronic liver diseases, including cirrhosis and non-alcoholic fatty liver disease, are associated with low-grade systemic inflammation. Elevated levels of pro-inflammatory cytokines (IL-6, TNF-α, CRP) contribute to osteoclast activation and destruction of periodontal tissues (Hajishengallis G., 2015).

Studies show that patients with liver cirrhosis have a higher prevalence and greater severity of periodontitis compared to the general population (Grønkjær L.L., 2015). The severity of periodontal damage correlates with the stage of liver failure.

According to Rakhimov B.B. and Karimova D.K. (2020), patients with chronic hepatitis demonstrate a higher incidence of generalized periodontitis and a more severe clinical course of the disease.

One of the key mechanisms is the translocation of bacterial endotoxins. Periodontopathogenic microorganisms such as Porphyromonas gingivalis and Tannerella forsythia are capable of entering the systemic circulation and enhancing inflammatory processes in the liver (Yoneda M. et al., 2012).

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On the other hand, liver diseases impair intestinal barrier function, facilitating the entry of lipopolysaccharides (LPS) into the bloodstream and triggering inflammatory responses (Tilg H., Moschen A.R., 2014).

Thus, a bidirectional relationship between periodontal diseases and liver pathology is formed.

Recent studies confirm the existence of the "oral–gut–liver axis," which integrates microbiological and immune processes (Albuquerque-Souza E., Sahingur S.E., 2022).

According to Kamada N. et al. (2013), changes in the oral microbiota may influence gut microbiota composition, contributing to the development of inflammatory liver diseases. Conversely, liver dysfunction alters saliva composition and oral environmental conditions, promoting the growth of pathogenic microflora.

Studies by Saidov M.M. et al. (2021) demonstrate pronounced dysbiotic changes in the oral microbiota of patients with liver diseases, including an increased proportion of anaerobic pathogens.

In chronic liver diseases, the following immunological changes are observed:

- decreased neutrophil activity;
- impaired macrophage function;
- imbalance of Th1/Th2 response;
- reduced immunoglobulin levels.

These alterations lead to decreased control over the microbial biofilm and accelerated destruction of periodontal tissues (Han P. et al., 2016).

According to Turaev Kh.N. and Abdullaeva N.R. (2018), patients with liver cirrhosis exhibit a significant reduction in local oral immunity, contributing to chronic inflammation in periodontal tissues.

Clinical studies (Nwhator S.O. et al., 2013) indicate that patients with liver pathology more frequently present with:

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- generalized moderate to severe periodontitis;
- pronounced gingival bleeding;
- deep periodontal pockets;
- tooth mobility.

Additionally, mucosal alterations such as xerostomia, candidiasis, glossitis are observed.

Liver transplantation is an effective treatment for end-stage liver disease; however, it requires long-term immunosuppressive therapy.

According to Guggenheimer J. et al. (2003), transplant recipients show a high prevalence of periodontal diseases and oral mucosal lesions.

Immunosuppressive drugs may cause:

- gingival hyperplasia (especially cyclosporine-induced);
- suppression of immune response;
- increased susceptibility to fungal and bacterial infections.

According to Galdino T.M. et al. (2021), patients after transplantation demonstrate more severe periodontal tissue destruction and poorer clinical parameters compared to controls.

Oral health plays a crucial role in transplantation outcomes. According to Olander A.E. et al. (2023), poor pre-transplant oral health is associated with a higher risk of infectious complications.

Chronic oral infections may lead to bacteremia and systemic inflammation, which is particularly dangerous in immunocompromised patients.

Current recommendations include:

- mandatory oral санация (sanitation) before transplantation;
- regular post-operative monitoring;
- individualized anti-inflammatory therapy;
- control of immunosuppressive side effects.

According to Slots J. (2017), a comprehensive approach to periodontal treatment can reduce systemic inflammation and improve overall patient outcomes.

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Conclusion

Current scientific evidence confirms a close bidirectional relationship between liver diseases and inflammatory periodontal conditions. Systemic inflammation, immune dysfunction, and dysbiosis represent key pathogenetic mechanisms.

In liver transplant recipients, these processes are exacerbated by immunosuppressive therapy, which determines the clinical course and necessitates a specialized treatment approach.

Findings from national studies complement global data and highlight the relevance of this issue for Republic of Uzbekistan.

Further research should focus on the development of personalized diagnostic and therapeutic strategies based on immune status and microbiological characteristics.