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INFLUENCE OF COMPLEX THERAPY ON ORAL MICROBIOCENOSIS IN PATIENTS WITH CHRONIC HEPATITIS B: A COMPARATIVE APPROACH

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Abstract. The aim of this study was to evaluate the effect of complex therapy on the oral microbiological state in patients with chronic hepatitis B (CHB). A comparative analysis was conducted between subgroups of patients receiving complex and traditional therapy. It was found that the application of complex therapy significantly increased the levels of normal flora representatives (Lactobacillus Sp., Veillonella Sp., Streptococcus Sp.) while reducing the counts of opportunistic and pathogenic microorganisms (Staphylococcus Sp., E. coli, Klebsiella Sp., Proteus). In subgroups receiving traditional therapy, positive changes were less pronounced. The obtained results confirm the effectiveness of complex therapy in restoring oral microbiocenosis and reducing the risk of dysbiotic disorders in patients with CHB.
Keywords: Chronic hepatitis B; oral microbiota; dysbiosis; complex therapy; normal flora; opportunistic microorganisms; pathogenic microorganisms.

Introduction. Chronic hepatitis B virus (CHBV) infection remains one of the most pressing issues in modern medicine due to its high prevalence, frequent progression to chronic forms, and the risk of severe complications, including cirrhosis and hepatocellular carcinoma. According to the World Health Organization, more than 250 million people worldwide are chronic carriers of the hepatitis B virus, which underscores the need for the development of comprehensive approaches to therapy and patient rehabilitation.

Of particular interest is the study of the oral microbiocenosis in patients with CHBV. It is well known that chronic liver diseases are accompanied by alterations in both local and systemic immunity, which may contribute to the development of dysbiotic disturbances in the oral cavity. These changes, in turn, increase the risk of inflammatory diseases of the oral mucosa, periodontal tissues, and secondary infectious complications.
Traditional treatment regimens for CHBV are primarily aimed at antiviral therapy and maintaining liver function; however, their effectiveness in correcting the microbial balance of the oral cavity remains limited. In this regard, an important task is to search for therapeutic approaches that simultaneously take into account the systemic condition of the patient and the local changes in the oral microbiocenosis**.**
Comprehensive therapy, which, in addition to traditional treatment, includes supplementary measures aimed at restoring the microbiota, represents a promising direction in both dental and general medical practice. It is assumed that its application may contribute to the normalization of the composition of the normal microflora, the reduction of opportunistic and pathogenic microorganisms, as well as the improvement of the overall oral health of patients with CHBV.

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In this regard, **the aim of the present study** was to conduct a comparative analysis of the effects of comprehensive versus traditional therapy on the oral microbiocenosis in patients with chronic hepatitis B virus infection.

The **objective of the study** is a comparative assessment of the effectiveness of comprehensive and traditional treatment in patients with chronic hepatitis B virus infection (CHBV), based on microbiological dynamics.

Materials and Methods. The study included 60 patients with CHBV, divided into two main groups of 30 individuals each. Each group was further subdivided into subgroups:

- **Subgroups 1A and 2A** – patients who received comprehensive treatment, including hygiene measures (individual selection of toothbrushes, rinsing with *Eludril* solution, and applications of *Parodium* 3–4 times a day);
- **Subgroups 1B and 2B** – patients who received traditional treatment.

Results and Discussion. Microbiological studies were conducted dynamically: at baseline (before treatment), after 15 days, and after 30 days of therapy. The effectiveness of therapy for dysbiosis was evaluated by assessing changes in the oral microflora, comparing the results with control indicators and reference (normative) values.

The results of our study demonstrate that the use of **comprehensive therapy** in patients with chronic hepatitis B virus infection (CHBV) contributes to a significant improvement in the microbiological condition of the oral cavity. The diagram clearly illustrates the differences in the indicators of dysbiosis and the microbial state between the subgroups receiving comprehensive and traditional treatment.

In the subgroups receiving comprehensive therapy (1A and 2A), a significant restoration of the microbiological balance was observed: a normal microbiological status was achieved in 45% of patients in subgroup 1A (7 out of 15) and in 41% in subgroup 2A (6 out of 15). In the subgroups receiving traditional treatment (1B and 2B), this indicator was considerably lower — 7% in subgroup 1B (1 out of 15) and 0% in subgroup 2B (0 out of 15), which confirms the advantage of the comprehensive approach ($P < 0.05$).

Comprehensive therapy also contributed to a reduction in the level of dysbiotic shifts: in subgroups 1A and 2A, it decreased to 25% (4 out of 15) and 32% (5 out of 15), respectively, whereas in the subgroups receiving traditional treatment (1B and 2B), the level of dysbiotic shifts remained high — 40% in subgroup 1B (6 out of 15) and 53% in subgroup 2B (8 out of 15). This difference indicates a better adaptation of the microbiota to therapy and a reduction in imbalance ($P < 0.05$).

Regarding the indicator of dysbiosis of degrees I–II, the subgroups receiving comprehensive therapy showed a decrease to 13% (2 out of 15) in subgroup 1A and 20% (3 out of 15) in subgroup 2A, confirming a stable positive trend. In the subgroups receiving traditional treatment (1B and 2B), the level remained at 20% (3 out of 15 patients in each subgroup).

Comprehensive therapy also led to a reduction in cases of grade III dysbiosis, decreasing it to 7% in subgroups 1A and 2A (1 out of 15 patients in each subgroup), whereas in the traditional treatment subgroups this indicator was higher — 19% in subgroup 1B (3 out of 15) and 13% in subgroup 2B (2 out of 15). Moreover, cases of grade IV dysbiosis were absent in the subgroups receiving comprehensive therapy (0 out of 15 in each subgroup), while in the subgroups treated with the traditional approach they accounted for 14% in subgroup 1B (2 out of 15) and 13% in subgroup 2B (2 out of 15) ($P < 0.05$).

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A diagram illustrates the differences in the microbial composition between the subgroups. Particular attention was given to the indicators of normal flora (e.g., *Lactobacillus* sp., *Veillonella* sp.), opportunistic bacteria (*Staphylococcus* sp., *E. coli*), and pathogenic microorganisms (*Klebsiella* sp., *Proteus*). The data confirm that comprehensive therapy exerts a more significant effect on restoring the oral microbial balance, promoting an increase in the levels of normal flora and a reduction in pathogenic microflora.

The 1A and 2A subgroups, after comprehensive therapy, demonstrated a notable increase in representatives of normal flora. The titers of *Lactobacillus* sp. increased to 10^6 CFU/mL, accounting for 60% of the total microbial composition in subgroup 1A and 58% in subgroup 2A. The levels of *Veillonella* sp. reached 10^6 CFU/mL (55% in 1A and 53% in 2A), while the titers of *Streptococcus* sp. increased to 10^5 CFU/mL (40% in 1A and 38% in 2A). These changes indicate the restoration of microbial balance under the influence of comprehensive therapy.

The subgroups receiving traditional treatment (1B and 2B) showed a less pronounced increase in normal flora. In particular, *Lactobacillus* sp. accounted for 50% and 45% in subgroups 1B and 2B, respectively, corresponding to a titer of 10^5 CFU/mL, while *Veillonella* sp. showed growth to 45% and 42% in subgroups 1B and 2B, respectively. These findings indicate a more limited effectiveness of traditional treatment in restoring normal flora.

In the subgroups receiving comprehensive therapy (1A and 2A), there was a marked reduction in the titers of opportunistic microorganisms. The titers of *Staphylococcus* sp. decreased to 10^3 CFU/mL, accounting for 10% in subgroup 1A and 9% in subgroup 2A. *E. coli* levels dropped to 10^2 CFU/mL (5% in 1A and 4% in 2A). This indicates the positive impact of comprehensive therapy aimed at suppressing opportunistic bacteria and preventing dysbiotic disorders.

In the subgroups receiving traditional therapy (1B and 2B), the levels of opportunistic microorganisms remained elevated. *Staphylococcus* sp. reached 10^4 CFU/mL (15% in subgroup 1B and 18% in subgroup 2B), while *E. coli* persisted at 10^3 CFU/mL (10% in 1B and 12% in 2B). These findings suggest the insufficient effectiveness of the traditional approach in suppressing opportunistic microorganisms.

Comprehensive therapy also demonstrated a substantial reduction in the titers of pathogenic microorganisms (Klebsiella sp., Proteus). In subgroups 1A and 2A, the titers of *Klebsiella* sp. decreased to below 10^2 CFU/mL, accounting for only 2% and 1%, respectively. *Proteus* was also suppressed to 10^2 CFU/mL (3% in 1A and 2% in 2A). These indicators highlight the high effectiveness of comprehensive therapy in inhibiting pathogenic bacteria.

In contrast, traditional therapy (1B and 2B) showed a less pronounced reduction in pathogenic microorganisms. *Klebsiella* sp. remained at approximately 10^3 CFU/mL (5% in 1B and 7% in 2B), while *Proteus* accounted for about 10^3 CFU/mL (8% in 1B and 10% in 2B), confirming the lower degree of suppression of pathogenic microorganisms with this approach.

The results of the study demonstrate that comprehensive therapy is significantly more effective than the traditional approach in normalizing the microbial composition of the oral cavity in patients with CHBV. Under the influence of comprehensive therapy, subgroups 1A and 2A achieved an increase in the titers of normal flora and a significant reduction in the titers of opportunistic and pathogenic microorganisms, indicating the restoration of microbial balance and a reduced risk of inflammatory complications.

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