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Diagnostic Significance of Microbiological Research Methods for Oral Candidosis in Infants

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Abstract: The article presents the results of clinical and microbiological research on newborns with oral candidiasis. The frequency of Candida genus fungi detection and their species structure depending on clinical symptoms were evaluated. The high diagnostic significance of the bacteriological method in confirming the diagnosis and determining the degree of colonization of the oral mucosa has been demonstrated.

Keywords: newborns, oral candidiasis, Candida albicans, bacteriological examination, diagnosis

INTRODUCTION

Candidiasis of the oral cavity in newborns remains a pressing clinical issue in neonatology and pediatric dentistry. According to various authors, the incidence of fungal lesions of the mucous membrane in early childhood remains high and varies depending on the conditions of care and the child's immunological status [1].

The primary causative agent of oral candidiasis is Candida albicans, which is confirmed by numerous studies [2]. However, in recent years, there has been an increase in the role of non-albicans species such as C. tropicalis and C. glabrata [3].

Clinical diagnosis of the disease does not always allow for a reliable distinction between candidiasis and other mucosal conditions, which emphasizes the importance of laboratory methods [4].

Bacteriological research remains the "gold standard" of diagnosis, allowing not only to confirm the presence of fungi but also to determine their species composition and degree of colonization [5], [6].

PURPOSE OF THE STUDY

To evaluate the diagnostic significance of the bacteriological method for oral candidiasis in newborns.

MATERIALS AND METHODS

This clinical and laboratory study was aimed at evaluating the diagnostic value of the bacteriological method for oral candidiasis in newborn infants.

The study was conducted at an inpatient department and included 80 newborns aged 0 to 28 days. The sample was formed based on clinical inclusion and exclusion criteria, which ensured the comparability

of the groups by key demographic and clinical parameters.

All the infants in the study were divided into two clinically comparable groups.

The main group consisted of 40 newborns with clinical manifestations of candidal lesions of the oral mucosa. The diagnostic criteria were the presence of a characteristic white or grayish-white, curd-like plaque on the mucosa of the tongue, cheeks, and hard palate, as well as signs of local mucosal inflammation.

The control group consisted of 40 newborns without clinical signs of oral fungal infection, who had no visual changes in the mucous membrane or complaints indirectly indicating an infectious process.

Biological material collection was carried out in compliance with aseptic and antiseptic standards. Swabs were taken from the oral mucosa (tongue, inner surface of the cheeks, palate area) using sterile, single-use cotton swabs. The procedure was performed before feeding or no earlier than two hours after feeding to exclude the influence of food residues on the research result.

The resulting material was delivered to the microbiological laboratory in the shortest possible time. Sowing was carried out on the Saburo selective nutrient medium, which provides optimal conditions for the growth of yeast-like fungi of the genus Candida. Incubation was carried out at a temperature of 35–37 °C for 24–48 hours under aerobic conditions.

Identification of the isolated cultures was performed based on a complex of microbiological traits, including the morphological characteristics of colonies, microscopic patterns, growth patterns in the nutrient medium, and biochemical test results. Additionally, the species affiliation of the Candida genus was determined.

The evaluation of results included quantitative and qualitative growth analysis: the degree of seed infestation (poor, moderate, abundant growth), as well as the presence of mono- or mixed crops, were determined.

Statistical processing of the obtained data was carried out using methods of variational statistics. The comparison of groups was conducted by calculating the significance criterion for differences; indicators were considered statistically significant when $p < 0.05$.

RESEARCH RESULTS AND DISCUSSION

The conducted microbiological study allowed for the establishment of significant differences in the detection frequency of Candida genus fungi between the primary and control groups [7], [8].

In the main group, positive culture results were obtained in 34 out of 40 examined newborns, accounting for 85.0%. In the remaining 6 children (15.0%), the growth of fungal microflora was either absent or minimal in nature, lacking diagnostic significance [9].

In the control group, Candida fungi were detected in 9 out of 40 newborns, which corresponds to 22.5% of cases. In 31 children (77.5%), the cultures were negative [10].

Comparative analysis showed statistically significant differences between the groups ($p < 0.05$), confirming the high diagnostic value of the bacteriological method in detecting oral candidiasis [11], [12].

An analysis of the species composition of the isolated microorganisms revealed a predominance of Candida albicans, which was identified in 28 newborns in the main group (70.0%) [13]. In the control group, this species was detected significantly less often—in 6 infants (15.0%).

Other species of the Candida genus, including Candida tropicalis and Candida glabrata, were found

much less frequently and mainly as single or mixed cultures, accounting for approximately 15.0% of cases in the main group [14].

An assessment of growth intensity established that newborns with clinical manifestations of candidiasis predominantly showed abundant colony growth with a tendency to merge, indicating a high degree of colonization of the oral mucosa.

In the control group, fungal growth was characterized by scarcity or single colonies, which can be considered transient carriage of opportunistic microflora without clinical manifestation [15].

Thus, the obtained data indicate a direct correlation between the clinical severity of the candidiasis process and the results of the microbiological study. The high frequency of Candida albicans detection confirms its leading role in the etiology of oral candidiasis in newborns, and the degree of colonial growth can be considered an additional criterion for the activity of the infectious process.

CONCLUSIONS

The conducted clinical and laboratory examination established the high diagnostic significance of the bacteriological method for oral candidiasis in newborns. The obtained results indicate that Candida fungi are significantly more frequently detected in children with clinical manifestations of the disease (85.0%), compared to newborns without symptoms of oral mucosal damage (22.5%), with differences between groups being statistically significant ($p < 0.05$). In the structure of the isolated microorganisms, the leading role belongs to Candida albicans, which confirms its primary etiological significance in the development of candidiasis infection in the early neonatal period. It has been established that in the clinically pronounced form of the disease, an intensive and abundant growth of fungal colonies is observed, while in children without symptoms, predominantly sparse or transient growth is identified, reflecting the carriage of conditionally pathogenic microflora. Thus, bacteriological examination is an informative method that allows not only to confirm the diagnosis of oral candidiasis but also to assess the degree of microbial colonization, the activity of the infectious process, and to determine the species composition of the pathogen, which is important for choosing rational therapy and preventing complications.

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