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FEATURES OF TREATMENT OF CHRONIC APICAL PERIODONTITIS IN CHILDREN

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Abstract

Periodontal diseases are one of the most common inflammatory disorders affecting the tissues surrounding teeth. Gingivitis is a mild form of periodontal disease that causes redness and swelling (inflammation) of the gums. Despite the fact that gingivitis is localized within the gum tissue, without periodontal tissue disorders, there is still a risk of periodontitis. In the article, the author applied a new method of treating periodontitis in children, including comprehensive treatment aimed at increasing the effectiveness of antiseptic treatment, stimulating tissue regeneration and activating the processes of apexogenesis. In contrast to the standard protocol of root canal sanitation, the treatment in the main group was carried out using a more extended antiseptic effect.

Keywords: children, baby teeth, treatment, chronic apical periodontitis

Introduction

Over the past few decades, significant scientific advances in dentistry have led to improved oral health management with a stronger focus on prevention. Baby teeth save space for permanent teeth to erupt, help with chewing, and provide phonetics and aesthetics. The American Academy of Pediatric Dentistry's Reference Guide strongly emphasizes the importance of controlling dental development and bite in children and adolescents, as well as the implications of these changes for their overall health. [2,4]. In order to preserve baby teeth on the dental arch for as long as possible and increase the success of endodontic treatment, several studies have been conducted in recent years in order to find new materials and methods [5].Endodontic therapy aimed at eliminating bacteria from an infected root canal is still a complex procedure today, especially for pediatric patients [3].In a special category of pediatric patients, such as non-contact patients and patients with special needs, a different approach was needed to make treatment simpler and less time-consuming [1].The aim of the study was to evaluate the results of treatment of chronic apical periodontitis in children.120 patients with chronic periodontitis aged 6 to 11 years were included in the study. Of these, the main group consisted of 61 patients with unformed dental roots, the comparison group consisted of 59 patients with formed dental roots. The control group consisted of 30 children of the appropriate age without signs of periodontitis.All patients with periodontitis were under the supervision of a doctoral candidate in the period 2022-2024. The diagnosis of periodontitis was verified according to the requirements of the World Health Organization (WHO), classified according to the international Classification of diseases (ICD-10) and patients were divided into 2 classification groups depending on the type of treatment received. The distribution of patients into groups was carried out using the randomized stratification method to ensure sample uniformity and minimize the influence of random factors. A total of 120 children with chronic apical periodontitis aged 6 to 11 years were included in the study. Of these, 61 children were assigned to the main group, and 59 to the comparison group. The stratification was carried out taking into account the gender and age of the patients, which allowed the formation of groups with comparable demographic characteristics. In the

main group, boys made up 50.8% and girls 49.2%, in the comparison group boys made up 49.2% and girls 50.8%. The average age of children in the main group was 8.9 ± 1.7 years, in the comparison group – 8.8 ± 1.6 years. (Table 1.) Additionally, a control group consisting of 30 healthy children of the same age without signs of periodontitis and concomitant pathologies was included in the study. The control group was used to compare indicators in order to identify abnormalities characteristic of children with chronic apical periodontitis, as well as to evaluate the effectiveness of treatment in the main and comparative groups. All three groups were comparable in the main demographic parameters, which is confirmed by the absence of statistically significant differences ($p< 0.05$).

Table 1.

Distribution of patients by gender and age in the study groups

Age	Main group (n=61)		Comparison group (n=59)		Control group (n=30)		Total (n=150)
	Boys, абс (%)abs	Girls, abs (%)	Boys, abs (%)	Girls, abs (%)	Boys, abs (%)	Girls, abs (%)	Boys, abs (%)
6-7 years	9 (14,8%)	7 (11,5%)	8 (13,6%)	3 (5,1%)	4 (13,3%)	3 (10%)	21 (14%)
8-9 years	11 (18%)	13 (21,3%)	10 (16,9%)	15 (25,4%)	5 (16,7%)	5 (16,7%)	26 (17,3%)
10-11 years	11 (18%)	10 (16,4%)	11 (18,6%)	12 (20,3%)	6 (20%)	7 (23,3%)	28 (18,7%)
Total	31 (50,8%)	30 (49,2%)	29 (49,2%)	30 (50,8%)	15 (50%)	15 (50%)	75 (50%)

Traditional therapy was used in patients of both groups and included standard endodontic procedures aimed at rehabilitating root canals, suppressing infection, and providing conditions for the formation of an apical barrier. Treatment began with the preparation of the carious cavity, the opening of the tooth cavity and the removal of necrotic tissues. After mechanical and medical treatment of the root canals using 2.5% sodium hypochlorite solution and subsequent rinsing with saline solution, temporary obturation of the root canal with a paste based on calcium hydroxide was performed. The duration of the temporary filling was up to three months, after which a control X-ray examination was performed to assess the formation of the apical barrier. Restoration of the tooth crown was carried out using photopolymer composite materials or glass ionomer cement.In addition to traditional therapy, patients in the main group underwent complex treatment aimed at increasing the effectiveness of antiseptic treatment, stimulating tissue regeneration and activating the processes of apexogenesis. In contrast to the standard protocol of root canal sanitation, treatment in the main group was carried out using a more

extended antiseptic effect, which included pre-rinsing irrigation with 2.5% sodium hypochlorite solution and 0.5% hydrogen peroxide and final rinsing with saline solution to remove irrigation residues. Additionally, ultrasound treatment of the root canal using the Endocage method was used to increase the efficiency of biofilm and necrotic tissue removal, as well as low-intensity laser therapy with antimicrobial, anti-inflammatory and biostimulating effects. At the stage of the main treatment, biomaterials that promote targeted tissue regeneration were used in the main group. After antiseptic treatment and removal of infected areas of the root canal, bleeding from the apical opening was provoked in order to form a blood clot, which is the basis for stimulating apexogenesis. One of the modern osteoconductive materials, Biodentine or MTA (mineral trioxide aggregate), was introduced into the apical region, providing hermetic closure of the apex and possessing osteoinductive properties. In cases of significant destruction of periapical tissues, a collagen matrix was additionally used, which creates a favorable environment for bone regeneration. The crown part of the tooth in the main group was also repaired using glass ionomer cement to ensure tightness and prevent reinfection.

Conclusion. Thus, patients of both groups received traditional therapy, but patients of the main group additionally used advanced antiseptic treatment methods, hardware technologies and regenerative materials that contribute to the accelerated restoration of tooth root structures. The effectiveness of the therapeutic measures was assessed based on the dynamics of dental indicators, including the depth of periodontal pockets, the degree of tooth mobility, the index of bleeding gums, the hygienic index and radiological changes in the periapical region. For an objective analysis of the treatment results, the studies were conducted in dynamics, with the registration of indicators before the start of therapy, as well as three, six and twelve months after the treatment, which made it possible to evaluate not only the immediate therapeutic effect, but also the long-term results of the methods used.

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