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FEATURES OF PROFESSIONAL ORAL HYGIENE IN SCHOOL-AGE CHILDREN

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Abstract. Inflammatory periodontal diseases are characterized by an increase and a high frequency of occurrence in the population not only among the adult population, but also in children. The main principle of treatment and prevention of VZP is to reduce the contamination of microorganisms of dental plaque. Removal of soft dental deposits from the surfaces of teeth is most physiologically carried out with an air-abrasive technique. In the presented clinical study, a comparative analysis of air-abrasive agents of various generations used in the comprehensive prevention and conservative treatment of inflammatory periodontal diseases in school-age children was performed. It is shown that air-abrasive products based on erythritol, along with good cleansing properties, have more pleasant organoleptic qualities and to a lesser extent lead to increased sensitivity of tooth enamel after professional oral hygiene in school-age children.

Key words: *periodontitis; gingivitis; oral hygiene in children; air-abrasive agents; erythritol.*

ОСОБЕННОСТИ ПРОВЕДЕНИЯ ПРОФЕССИОНАЛЬНОЙ ГИГИЕНЫ ПОЛОСТИ РТА У ДЕТЕЙ ШКОЛЬНОГО ВОЗРАСТА

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Резюме. Воспалительные заболевания пародонта (ВЗП) характеризуются ростом и высокой частотой встречаемости в популяции не только среди взрослого населения, но и у детей. Главным принципом лечения и профилактики ВЗП является снижение контаминации микроорганизмов зубной бляшки. Удаление мягких зубных отложений с поверхностей зубов наиболее физиологично проводится при воздушно-абразивной методике. В представленном клиническом исследовании выполнен сравнительный анализ воздушно-абразивных средств различных поколений, применяемых в комплексной профилактике и консервативном лечении воспалительных заболеваний пародонта у детей школьного возраста. Показано, что воздушно-абразивные средства на основе эритритола наряду с хорошими очищающими свойствами обладают более приятными органолептическими качествами и в меньшей степени приводят к повышению чувствительности эмали зубов после проведения профессиональной гигиены полости рта у детей школьного возраста.

Ключевые слова: *пародонтит; гингивит; гигиена полости рта у детей; воздушно-абразивные средства; эритритол.*

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INTRODUCTION

Nowadays, inflammatory periodontal diseases are characterized by increase of such cases and high frequency of occurrence in the population both in adults and children. The prevalence of different forms of gingivitis in children is about 80%, periodontitis is about 3–5%. Periodontal diseases are most often detected by dentists in school-age children. In patients of 12–15 years old periodontal pathology, according to various authors, occurs in 92–100%, and bleeding gums observed in 25–39% of respondents, tooth tartar occurs in 40–82% of cases, periodontal pocket in 2–4%. Periodontal diseases are most often detected in children of 9–10 years [1–5].

The problem of inflammatory periodontal diseases in school-age children is often associated with the fact that periodontal tissues are in a long-term state of physiological restructuring: development, eruption, formation and resorption of the roots of temporary teeth and their subsequent replacement by permanent teeth. The main principle of treatment and prevention of inflammatory periodontal diseases is to educate the patient in oral hygiene and to take measures aimed at reducing the contamination of microorganisms of biofilm (polymicrobial community fixed on the tooth surface) in the oral cavity [1, 3, 4, 9]. In this regard, conducting a timely complex of preventive hygiene is a very important and relevant area of prevention and treatment for periodontal diseases in children.

The removal of soft dental deposits from tooth surfaces is most physiologically performed with the air-abrasive technique. Nowadays, the most common compositions for this method are agents based on sodium bicarbonate, calcium carbonate, and glycine [2–4]. Some of them are quite abrasive and form a rough surface not only on the tooth surface, but also on the soft tissues of the gingiva, which causes discomfort and dissatisfaction with the procedure [6–8, 10, 11]. Currently, a prophylactic system for air-abrasion based on an organic substance, erythritol carbohydrate, has appeared on the dental market [12].

AIM

To perform a comparative analysis of air-abrasive agents of different generations used in complex prophylaxis and conservative treatment of inflammatory periodontal diseases in school-age children.

MATERIALS AND METHODS

To realize the aim, clinical observation of 23 school-age children and adolescents with chronic generalized catarrhal gingivitis, who were treated in dental clinics, was performed. The average age of the patients was 12.2±4.5 years. The distribution of patients by sex in the groups was similar, so it was not taken into account further in the study.

Clinical observation of the patients was performed in two groups: Group 1–11 children, who received an oral hygiene with use of air-abrasive agent based on glycine; Group 2–12 children, who received the treatment with use of air-abrasive agent based on erythritol.

To assess the effectiveness of the selected agents objectively, the time spent on removal of soft and pigmented plaque was studied.

Dental hyperesthesia was analyzed using the dental sensitivity index (DSI) created by L.Y. Orekhova and S.B. Ulitovsky (2008). The condition of the mucous membrane and the deg-ree of bleeding were evaluated using the bleeding index (Muhlemann). Patients of both groups were examined according to the scheme: before the procedure and immediately after. All the results were recorded in the periodontal chart.

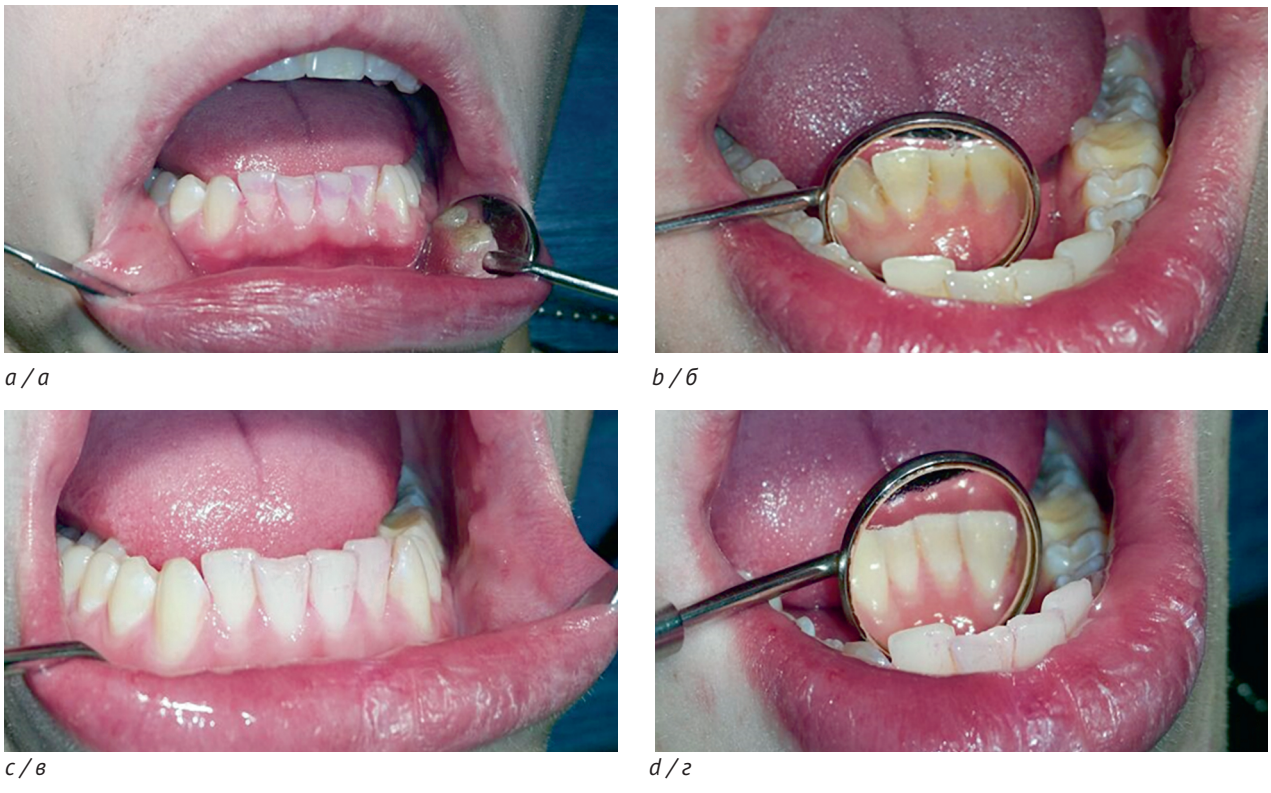
After professional hygiene each patient had to answer the questions of the questionnaire and evaluate the smoothness of teeth, taste of powder, general condition and satisfaction with the procedure.

Statistical processing of the results was performed using the software package STATISTICA 6. The mean (M) and standard error of the mean (m) were used to describe quantitative features. The Kraskell-Wallis H-criterion was used to compare the groups. The hypothesis of no differences between the indicators was rejected at $p < 0.05$.

RESULTS

No significant differences were obtained when we evaluated the time of occupational hygiene ($p > 0.05$). The mean time using the glycine-based product was 37.5+3.6 min, and using the erythritol-based product 38.4+3.8 min.

In Group 1, the mean value of tooth sensitivity was 44.7% (ranged from 41 to 60% — relatively compensated state of moderate tooth sensitivity); and in Group 2 – 29.9% (ranged from 21 to 40% — compensated state against the background of mild tooth sensitivity).



a / а *b / б* *c / в* *d / г*

Fig. 1. Patient H., 15 years old: *a*, *b* — oral cavity before professional hygiene; *c*, *d* — oral cavity after professional hygiene using air-abrasive agent based on erythritol

Рис. 1. Пациент Х., 15 лет: *а*, *б* — полость рта до проведения профессиональной гигиены; *в*, *г* — полость рта после проведения профессиональной гигиены с использованием воздушно-абразивного средства на основе эритритола

The condition of the mucous membrane and the degree of bleeding were evaluated using the bleeding index before and after the air-abrasion procedure. When glycine was used, the index (Muhlemann) before the procedure was 0.9+0.16, and after — 1.5+0.19. When we used an erythritol-based product, the index value was 0.8+0.19 and 1.2+0.18, respectively.

An example of professional hygiene in a patient of the 1st group is presented in Figure 1.

The results of the children's questionnaires were comparable in both groups, but the more pleasant taste of erythritol-based powder and better overall feelings of comfort after the procedure were noted in patients of Group 2. In Group 1, despite the visible effect of professional hygiene, four people (36.3%) noted unpleasant sensations after the procedure.

CONCLUSION

The clinical study showed that the mean time spent on hygiene with use of air-abrasive technique in both groups of school-age children did not differ significantly ($p > 0.05$). The increase in tooth sensitivity was more pronounced with use of glycine-based products (44.7%) than with erythritol-based products (29.9%). The value of gingival bleeding index was higher after using glycine (1.5 ± 0.19) than erythritol (1.2 ± 0.18). The questionnaire survey showed a high level of satisfaction with the procedure when erythritol-based powder was used. First of all, respondents noted more pleasant taste qualities of this product.

Thus, it can be concluded that air-abrasive agents based on erythritol and good cleaning properties have more pleasant organoleptic qualities and less lead to increased sensitivity of tooth enamel after professional oral hygiene in school-age children.

REFERENCES

1. Grudjanov A.I. Zabolevanija parodonta [Periodontal diseases]. Moskva, 2009; 102–73. (in Russian).
2. Leus P.A., Lobko S.S. Jeffektivnost' professional'noĭ gigieny polosti rta v profilaktike bolezneĭ periodontal [The effectiveness of professional oral hygiene in the prevention of periodontal diseases]. Klinicheskaja stomatologija.1997; 3: 70–2. (in Russian).
3. Sergeeva N.D., Kljushnikova O.N. Zabolevanija parodonta u detej: uchebnoe posobie [Periodontal

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diseases in children: a textbook]. FGBOU VO IGMU Minzdrava Rossii, Kafedra stomatologii detskogo vozrasta. Irkutsk: IGMU; 2019. (in Russian).
4. Iordanishvili A.K. Parodontologija [Periodontology]. Sankt-Peterburg: Izdatel'stvo Chelovek; 2020. (in Russian).
5. Tec V.V., Orehova L.Ju., Domorad A.A. i dr. Sravnitel'noe kliniko-mikrobiologicheskoe issledovanie primenenija zubnoĭ pasty Parodontax s ftorom pri lechenii i profilaktike zabolevaniĭ parodonta [Comparative clinical and microbiological study of the use of Parodontax toothpaste with fluoride in the treatment and prevention of periodontal diseases Periodontology]. Parodontologija. 2010; 15(3): 23–8. (in Russian).
6. Kaihara Y., Sasahara H., Niizato N. et al. Establishment of indicator for screening of child abuse and neglect in primary school-age children. Eur J Paediatr Dent. 2022; 23(4): 315–20.
7. Vasil'eva N.A., Bulgakova A.I., Soldatova E.S. Harakteristika stomatologicheskogo statusa pacientov s vospalitel'nymi zabolevanijami parodonta [Characteristics of the dental status of patients with inflammatory periodontal diseases]. Kazanskij med. zh. 2017; 2: 204–10.
8. Takimetbekova B.Zh. Vospalitel'nye zabolevanija tkanej parodonta u detej [Inflammatory diseases of periodontal tissues in children]. Vestnik KazNMU. 2014; 1. (in Russian).
9. Muzykin M.I., Iordanishvili A.K., Losev V.F., Levin S.A. Izuchenie psihofiziologicheskogo statusa pacientov i kachestva ih zhizni v hode stomatologicheskoj reabilitacii [Study of the psychophysiological status of patients and their quality of life during dental rehabilitation]. Rossijskij vestnik dental'noj implantologii. 2020; 3–4(49–50): 83–94. (in Russian).
10. Bhardwaj V.K., Sharma K.R., Luthra R.P. et al. Impact of school-based oral health education program on oral health of 12 and 15 years old school children. J Educ Health Promot. 2013; 2: 33.
11. Wong Y., Chang Y.J. The practices and needs of dietitian in school lunch program in Taiwan. Asia Pac J Clin Nutr. 2012; 21(1): 134–8.
12. Science and Therapy Committee of the American Academy of Periodontology. Periodontal Diseases of Children and Adolescents. J.Periodontol. 2003; 74: 1696–704.

ЛИТЕРАТУРА

1. Грудянов А.И. Заболевания пародонта. М.; 2009: 102–73.
2. Леус П.А., Лобко С.С. Эффективность профессиональной гигиены полости рта в профилактике болезней периодонта. Клиническая стоматология. 1997; 3: 70–2.
3. Сергеева Н.Д., Клюшникова О.Н. Заболевания пародонта у детей: учебное пособие. ФГБОУ ВО ИГМУ Минздрава России, Кафедра стоматологии детского возраста. Иркутск: ИГМУ; 2019.
4. Иорданишвили А.К. Пародонтология. СПб.: Человек; 2020.
5. Тец В.В., Орехова Л.Ю., Доморад А.А. и др. Сравнительное клинико-микробиологическое исследование применения зубной пасты Parodontax с фтором при лечении и профилактике заболеваний пародонта. Пародонтология. 2010; 15(3): 23–8.
6. Kaihara Y., Sasahara H., Niizato N. et al. Establishment of indicator for screening of child abuse and neglect in primary school-age children. Eur J Paediatr Dent. 2022; 23(4): 315–20.
7. Васильева Н.А., Булгакова А.И., Солдатова Е.С. Характеристика стоматологического статуса пациентов с воспалительными заболеваниями пародонта. Казанский мед. ж. 2017; 2: 204–10.
8. Такиметбекова Б.Ж. Воспалительные заболевания тканей пародонта у детей. Вестник КазНМУ. 2014; 1.
9. Музыкин М.И., Иорданишвили А.К., Лосев В.Ф., Левин С.А. Изучение психофизиологического статуса пациентов и качества их жизни в ходе стоматологической реабилитации. Российский вестник дентальной имплантологии. 2020; 3–4(49–50): 83–94.
10. Bhardwaj V.K., Sharma K.R., Luthra R.P. et al. Impact of school-based oral health education program on oral health of 12 and 15 years old school children. J Educ Health Promot. 2013; 2: 33.
11. Wong Y., Chang Y.J. The practices and needs of dietitian in school lunch program in Taiwan. Asia Pac J Clin Nutr. 2012; 21(1): 134–8.
12. Science and Therapy Committee of the American Academy of Periodontology. Periodontal Diseases of Children and Adolescents. J. Periodontol. 2003; 74: 1696–704.