

## Invention of a New Means "Aerodent" for the Primary Prevention of Dental Caries in Children

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### Abstract

*Dental caries is a common disease among the population of different geographical zones and countries of the world. Explains the complexity of the pathological condition. One of the urgent tasks now is to introduce new methods of preventing this caries and to improve the existing methods to identify promising ways to reduce this disease.*

**Keywords:** *Dental caries, oral hygiene, prevention*

**Relevance:** Oral hygiene is an important factor affecting the realization of the development of caries. Thorough and regular brushing of teeth can partially compensate for the effect of other factors (early infection with *Str. mutans* and excessive consumption of easily fermentable carbohydrates) [2].

However, many parents believe that there is no connection between the health of temporary and permanent teeth and therefore do not pay due attention to oral hygiene [15]. At the same time, it should be taken into account that young children do not need dental care, this procedure should be carried out for them by adults [2]. It is important that parents start brushing their children's teeth in a timely manner. Even before the appearance of the first teeth, mom or dad needs to clean the child's mouth with a napkin moistened with boiled water or a rubber fingertip. About six months, when the first teeth erupt, it is necessary to start using a soft baby brush, which should be changed every 3 months, and a paste with a calcium content. It is necessary to brush your teeth in the morning before breakfast and in the evening after the last meal [9].

For regions that are endemic in terms of the content of fluoride in water, you can use fluoride-containing pastes. However, the recommendations for the age at which these drugs can be used and the dosages vary in different countries and organizations (this issue is covered in more detail in the sub-chapter on the role of fluoride compounds). It is important that parents gradually impart knowledge and lay the foundations of hygienic education according to the age of the child in order to develop a habit first, and then in the future and form a stable skill of brushing teeth [10]. Starting from the age of 2.5-3, many children begin to brush their teeth themselves, but due to the immaturity of motor skills and the lack of a stable skill, the child will not be able to fully and correctly carry out oral hygiene on his own. It is necessary to monitor and help with the issue of brushing teeth from the parents [3].

**Methods and techniques.** It should be taken into account that the family lifestyle, hygiene habits and knowledge of the dental health of parents are a factor directly related to the possibility of developing caries in their children [12]. Quite recently, in order to prevent dental caries in children, probiotics have been introduced, from the positive properties of which they distinguish the ability to normalize the microbial landscape due to the production of bacteriocin, adhesion inhibitors [5], and according to Sookhee S. [4], they suppress the growth of caries-causing bacteria. At this time, the use of fluoride-containing pastes in children is regulated by professional communities in different ways. There is no approved basis for dosage, volumes and age limits, based on which the predicted effect

of using pastes with microdoses of fluoride is possible [9], does not exist. The US Center for Control and Prevention of Dental Diseases (CDCP) allows the use of toothpaste with fluoride ions for children no earlier than two years. A little earlier - from a year and a half, the use of fluoride-containing paste is allowed by the Australian Scientific Center for Dental Health of the Population [9]. The European Academy of Pediatric Dentistry [10], the Scottish Intercollegiate Information Organization (SIGN), the Organization of Dentists in Germany (DGK) and the American Academy of Pediatric Dentistry [1] suggest the use of fluoride-containing pastes when children have their first tooth erupted. Experts in the national recommendations of the British Pediatric Dentistry community and WHO consider the real use of drugs containing fluoride and do not set age limits [2]. In areas with insufficient saturation of fluoride ions in drinking water (less than 0.3 mg/l) [5], according to the requirements of professional dental associations, European and American unions [6], a comprehensive administration of systemic and local fluorides for the prevention of caries in children has been tested. However, the possibilities of using and confirmed data on the usefulness of restorative therapy for early childhood caries are not sufficiently developed. Taking into account the peculiarities of the initiation, development and course of caries in young children, it is urgent to develop and implement a method based on reducing the formation of plaque, inactivation of pathogenic microbial communities, in the prevention and treatment of dental caries in the most vulnerable population [2]. In New Zealand, the development of a Caries Prevention Program is based on studying the level of hygienic knowledge of women and teaching them individual oral hygiene [3]. A review of numerous foreign sources showed mandatory training of pediatricians on the main issues of prevention of dental diseases [6]. Thus, the analysis of the literature data showed that dental caries in children is a multifactorial economically and socially significant health problem, which requires a systematic, thorough approach to solve. The assessment of the strength and degree of exposure to risk factors of this disease should be carried out in the conditions of a particular patient, taking into account the stage of development and age - related features of the structure of milk teeth, as well as exo-and endogenous circumstances.

Some of the risk factors for the development of caries of baby teeth are associated with more or less objective circumstances (the state of the environment, the level of general somatic health of the mother, the course of pregnancy and childbirth), therefore, "attempts to influence them by patients" and the dentist are restrictive, only some correction is possible. However, a large group is occupied by risk factors that completely depend on the behavior of the child and his parents (the nature of nutrition, oral hygiene, motivation to maintain dental health, etc.) and can be minimized both by the dentist and by self-help measures [7, 2]. The well-known disjointed and antagonistic research on the timing of teething, as well as the polyetiological nature of the impact on the development of aggressive dental diseases, dictates the need to consider the regional and ethnic characteristics of the course of caries in young children, taking into account a differentiated approach in order to develop and implement a prevention program. At the same time, these factors will be the main objects that determine the scope and direction of therapeutic and preventive measures.

Thus, the search for new effective therapeutic and preventive measures that increase the resistance of enamel to the effects of acids in caries, increase the overall immunity of the body and reduce the risk of developing inflammatory periodontal diseases is currently continuing [2, 10].

A large number of calcium-containing drugs have been proposed for the treatment and prevention of dental caries. In our country, a 10% solution of calcium gluconate is widely used for application and electrophoresis, while the incidence of caries is reduced by 19,6-39,4% [8, 6]. Fluoride preparations in various types and modifications are also used for the treatment and prevention of caries, ranging from centralized fluoridation of drinking water, salt, milk to their use in the compositions of various hygiene products (toothpastes, gels, elixirs, etc.) [4]. Currently, there are only some reports of

alternative effective means of caries prevention [1]. An important part of the treatment of initial caries is strict compliance with the rules of oral care, the purpose of which is to prevent the formation and long-term existence of plaque in the area of demineralization. In addition, it is necessary to convince the patient to monitor the nature of the diet: reduce the consumption of carbohydrates and exclude them in the intervals between meals [2,1]. At the moment, complexes of medicinal plants with various pharmacological effects are used in dentistry - antimicrobial and anti-inflammatory (sanguiritrin, sanguicol, gingitek, rotokan, elecasol, stomatophyte), wound healing (hypozol, vitaon), antiviral (helepin, schizarin), immunomodulating (Phytomix-40) [3].

The pathogenic factors that can be affected by phytopreparations in the treatment of dental caries and periodontal diseases include plaque; the composition and properties of saliva; some diseases and conditions of the body [21]. The medicinal properties of phytopreparations are determined by the content of the so-called active (biologically active) substances-chemical compounds that can have a physiological effect of a therapeutic nature on a living organism [5]. From our point of view, medical oil obtained from the rhizomes and roots of medicinal hemophlebus, medicinal marigold flowers, carnation buds with the addition of ecdysterone has good regenerative, antiseptic, analgesic, wound healing, bactericidal properties [1]. A comparative evaluation of medicinal calendula preparations and other drugs with antiseptic and anti-inflammatory effects revealed its advantages in comparison with synthetic analogues [9]. A wide range of pharmacological activity is due to the rich content of carotenoids, flavonoids, vitamins, calcium, potassium, magnesium, sodium, phosphorus and a number of other macro and microelements in the flowers of the plant. At the same time, phytopreparations from calendula officinalis exhibit anti-inflammatory, wound-healing and bactericidal properties (coccal microflora and fungi are sensitive) [5].

**Conclusion.** Currently, preparations of medicinal hemophlebitis are widely used, which have antimicrobial, analgesic, hemostatic and astringent effects [1,4]. Polyphenolic compounds, in particular tannins, among which hydrolyzable tannins predominate, are considered to be the active substances of krovohelebk [2]. Tannin-containing substances are used in medicine, mainly for lubricating the skin with burns, cracks, ulcers. However, practically nothing is known about the inhibitory effect of tannin-containing herbal preparations on plaque microorganisms [6]. Tannins reduce the viability of pathogenic bacteria. Under their action, numerous bacterial flagella shorten and lose mobility, which significantly complicates the process of attaching bacteria to epithelial cells [5]. flax, wound healing, analgesic, cauterizing effect [4].

In recent years, phytoecdysteroids, which are widely distributed in the plant world, have attracted great attention in medicine. Phytoecdysteroids are a large class of polyhydroxylated steroid compounds found in higher plants. The unique properties of these compounds, such as anabolic, vasoprotective, immunostimulating, adaptogenic and tonic effects, were revealed.

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