
ORAL HEALTH PROMOTION IN CHILDREN SUFFERING FROM SYSTEMIC DISEASES

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ABSTRACT

INTRODUCTION: Modern dental medicine steadily aims at preserving the oral health status of the population. This is done not only by operative techniques and removal of affected hard tooth tissues but also by using preventive, non-operative and minimally invasive techniques. Measures are implemented to promote oral health in children and adolescents.

AIM: The aim of the present review is to clarify the role of oral health promotion in children suffering from systemic diseases.

MATERIALS AND METHODS: A literature review has been done on the basis of 30 referenced scientific publications from scientific databases. When doing the following literature review, we intended to discuss the already suggested methods of promoting oral health and hygienic status in children and adolescents suffering from certain systemic diseases and conditions and if no methods are already implemented - to suggest possible ones.

RESULTS: Our scientific interest marks the specifics of the oral status among children with anemia, epilepsy, diabetes mellitus (type 1), and problems with maintaining a balanced diet. In order to reduce the risks to the general health and well-being of the child by neglecting their oral health, lack of knowledge of the parents and late visits to dental specialists must be minimized.

CONCLUSION: Raising awareness through informational campaigns, visiting hospitalized children, making educational presentations and brochures and demonstrating the correct brushing techniques on phantom jaw models, regular dental check-ups, professional dental and self-care are key factors in oral health promotion. Medical doctors treating the given systemic disease, doctors of dental medicine, general practitioners and parents should work together to keep the balance between general and oral health.

Keywords: systemic diseases, oral health, oral health disorders, promotion, oral care

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INTRODUCTION

Modern dental medicine steadily aims at preserving the oral health status of the population. That is done not only by operative techniques and removal of affected hard tooth tissues but also using preventive, non-operative and minimally invasive techniques. Measures are implemented to promote oral health in children and adolescents. Dental diseases should be effectively managed. All medical specialists in the field of pediatric medicine and pediatric dentistry are well aware of the fact that a link between systemic diseases and their manifestation in the oral cavity has been established. The treatment of the systemic disease leads to an improvement of the oral health status. The inverse relation is discussed and proven by a number of authors.

Oral health promotion is defined as “any planned effort to build supportive public policies, create supportive environments, strengthen community action, develop personal skills or re-orientate health services in the pursuit of oral health goals.” Motivating individual behavior at home and receiving professional support from dentists are essential for the improvement of dental health (1,2). The following are all examples of effective oral health promotion: promoting healthy eating, teaching effective oral hygiene practices, facilitating early access to preventative dental services, promoting use of topical fluorides (3).

AIM

The aim of the present review is to clarify the role of oral health promotion in children suffering from systemic diseases.

MATERIALS AND METHODS

A literature review has been done on the basis of 30 referenced scientific publications from scientific databases - ScienceDirect, Google Scholar, PubMed and other scientific resources, such as materials and adopted guidelines from official websites of the World Health Organization (WHO), American Academy of Pediatric Dentistry (AAPD), European Academy of Pediatric Dentistry (EAPD), International Association of Pediatric Dentistry (IAPD), Ministry of Health of stated countries, etc. The following keywords were used: systemic diseases, oral health, oral health disorders, promotion, oral care.

The articles were compared to one another on the basis of different measures implemented when treating a pediatric patient suffering from a systemic and a dental disease

RESULTS

Good oral health enables people to fulfill their basic human needs of eating and socializing without being embarrassed or experiencing pain and discomfort (2). According to WHO, causative factors in oral health share a commonality with risk factors for major diseases (4). A strategy is implemented, which embraces the “common risk factor approach” that defines the strategy as empowering, participatory, holistic, equitable, and sustainable (5).

In the following literature review the already suggested methods of promoting oral health and hygienic status in children and adolescents suffering from certain systemic diseases and conditions were discussed and if no methods have already been implemented – plausible ones are proposed. Our scientific interest marks the specifics of oral status among children with anemia, epilepsy, diabetes mellitus (type 1), and problems maintaining a balanced diet.

Anemia is defined as a decrease in the number of erythrocytes in the circulation, a decrease in hemoglobin concentration and a decrease in hematocrit below the lower reference limit for the respective sex, age, altitude without changes in plasma volume. (6). According to some authors (7) early childhood caries is closely related to anemic conditions, because cytokines and other pro-inflammatory factors released in pulpitis and chronic periodontitis suppress erythropoiesis and synthesis of hemoglobin. Therefore oral hygiene must be well-maintained. That will lead to a reduction of the incidence of carious lesions and periodontal inflammatory processes. Carious lesions should be managed by preventive and non-operative measures such as reducing the caries risk factors and implementing re-mineralization, local fluoride-related techniques and using pit and fissure sealants.

Epilepsy is a chronic brain disease with different etiology, characterized by recurrent attacks, which arise from the overexcitation of a certain population of neurons. Seizures are distinguished by various transient clinical (motor, sensory, autonomous, psychic and behavioral) and electrophysiolog-

ical manifestations. Single epileptic seizures as well as those occurring in the course of an acute injury, in the absence of repeatability, are not considered epilepsy (8).

The use of valproic medications by children suffering from epilepsy is a risk factor for the development of gingival hyperplasia, and hence, inflammation of the gingival tissues, and for direct bone marrow suppression, which decreases wound healing and increases bleeding (due to the reduced platelet count) and infections (9,10,11). Phenytoin use as a risk factor for gingival hyperplasia is well-known and studied (12,13). Carbamazepine is rarely administered, but still reported for xerostomia and stomatitis (14).

The best methods for treatment of hyperplasia are not evident not only for adults but for children as well. The aim clearly must be meticulous oral hygiene – proper brushing and flossing techniques – for the child and his/her parents as well, use of chlorhexidine rinses (above the age of 6), brushing with fluoride toothpaste (careful control of the fluoride dosage), use of xylitol mints, which stimulate saliva production, proper eating habits, not administering drugs containing added sugar in liquid form before bedtime (15). Frequent visits to the dental practitioner for professional oral hygiene at intervals of 3 to 4 months are advisable. Dental health should not be neglected, on the contrary – the balance between treating the epilepsy and the drug-induced gingivitis in children taking antiepileptic drugs must be kept.

Diabetes mellitus (type 1) is a chronic metabolic inflammatory disease extensively studied by all branches of medicine with a complex clinical manifestation in childhood. Periodontal diseases, such as chronic gingivitis and periodontitis, tend to develop earlier and deteriorate faster. Diabetes mellitus is considered to be a predisposing factor for the development of periodontitis, and periodontitis is known to be the “sixth complication of diabetes” (16). An intimate connection exists between periodontal disease and diabetes (17,18). Uncontrolled diabetes with poor glycemic control is proven to cause severe forms of periodontitis. Hyperglycemia has a stimulating effect on the immune system - inflammatory cytokines are released (19). Moreover, the levels of glucose in the saliva and in the gingival crevicular fluid

increase and this promotes the development of periodontal pathogens. The hyperglycemia also causes microangiopathy of blood vessels in gingival tissues - their walls are damaged. The functions of polymorphonuclear leukocytes are also impaired, which is associated with the progression of the inflammatory process. Larger amounts of glycated metabolites are formed. They cause cell stress and are involved in the degradation of collagen.

Patients who brush their teeth at least two times daily, regularly floss, and use chlorhexidine rinse have a clinically established low plaque index and lower mean levels of glycated hemoglobin (20). They have a lower chance of developing carious lesions and periodontal diseases. Regular dental visits and education on oral and systemic complications of diabetes should be an indispensable part of the promotion of general and oral health. Through preventive measures, the consequences of diabetes affecting the periodontal tissues could be minimized (21).

A balanced diet is an essential factor in the normal physical and neuropsychological development of the individual. The latter may contribute to a significant reduction in levels of caries and its complications. Dental caries is the most common oral bacterial and behavioral disease among children under the age of five and although it is preventable, it affects many children, especially those in socially disadvantaged groups of society. Increased consumption of sugary foods and beverages high in simple carbohydrates (22,23) has been reported to be a leading dietary mistake that provokes development of metabolic syndrome and dental caries. In turn, the metabolic syndrome is associated with obesity, dyslipidemia, diabetes, and hypertension (15,24,25).

It is important to distinguish natural sugar in fruits and vegetables, in cereals and milk from foods in which artificial sugar is added (26). Sugar is considered to be one of the major cariogenic factors since early childhood (26,27,28).

Endogenous and exogenous fluorine prophylaxis and good oral hygiene reduce the risk of developing carious lesions by stimulating the process of remineralization and blocking the demineralization of hard dental tissues (15). Oral health promotion programs that maximize the use of fluoride can

be the most cost-effective methods in reducing tooth decay (29).

The most effective programs usually involve fluoride vehicles - fluoride toothpastes (self-care) or fluoride varnish programs (professional oral dental care) (30).

Reviews have shown the use of fluoride toothpastes to be the most effective (31,32).

The efficient approaches of successful management of oral health disorders, respectively caries and complicated tooth decay lesions on hard teeth tissues, and diseases of the periodontal apparatus are related to the suppression of inflammatory processes in the oral cavity. Furthermore, the maintenance of the dynamic balance of homeostasis concerning the functional activities of oral structures provides favorable conditions for overcoming the systemic disorder.

The performance of combinations of primary, secondary and tertiary prophylactic care for rehabilitation and adaptation of the oral dental tissue complex of the individual and society as a whole requires close interrelations between specialists from different fields of medicine and dental medicine in the context of personal and community needs.

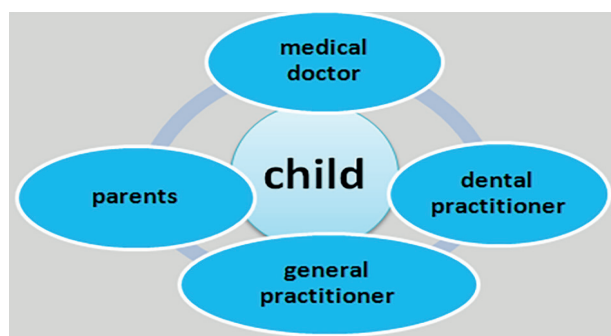


Figure 1

CONCLUSION

The oral cavity is as important as any other part of the digestive system (33,34). In order to reduce the impairment of the general health and well-being of the child by neglecting the oral health, the lack of knowledge of the parents and late visits to dental specialists must be avoided (35,36). Raising awareness through informational campaigns, visiting hospitalized children, making educational presentations and brochures on the topic of oral health and demonstrating the correct brushing techniques on phantom

jaw models, regular dental check-ups, professional dental and self-care are key factors in oral health promotion. Medical doctors treating the diagnosed systemic disease, doctors of dental medicine, general practitioners and parents should work together to keep the balance between the general and oral health of the children.

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