

MODERN METHODS OF DIAGNOSIS OF DENTAL CARIES IN CHILDREN

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Annotation

Early diagnosis of dental caries plays an important role in maintaining dental health. It has been scientifically proven that initial carious lesions are reversible. The modern approach to the diagnosis of caries requires the use of new diagnostic criteria that make it possible to diagnose the demineralization of hard tissues before the formation of a carious cavity. In the article, along with well-known traditional methods of diagnosing dental caries in children, such as visual examination, vital staining, X-ray, electro-dental diagnostics. The existing diagnostic devices are characterized: the quantitative light-induced fluorescence (QLF) device and the method of laser fluorescence diagnostics Diagnodent. The International System for the Detection and Prevention of dental caries ICDAS-P. is described in detail. Working with new diagnostic methods, which represents a new principle for the diagnosis of carious disease, will allow the dentist to change the fundamental approach to the treatment of initial caries without dissection.

Keywords

Caries, baby teeth,

Introduction.

A modern approach to maintaining dental health in children is possible only with early detection and a minimally sparing approach to caries treatment. Carious disease is the most common disease in children. Currently, the concepts of caries treatment have also changed:

there has been a transition from an aggressive strategy to a strategy of prevention and minimally invasive treatment. It should be borne in mind that the early

The diagnosis of caries makes it possible to remineralize carious lesions at the initial stage of development and weaken risk factors and timely resort to preventive measures. To avoid it or to detect it at an early stage,

timely diagnosis is necessary. Timely diagnosis of caries in the initial stage is a 50% success rate in its treatment. However, for an early stage, a highly qualified dentist is required. The purpose of the diagnosis is to make a definitive diagnosis.,

which determines the plan of therapeutic and preventive measures and ultimately affects the outcome of the disease. Diagnosis is an important aspect of clinical medicine, without which diagnosis is impossible, therefore, subsequent prescribing of treatment and preventive measures is difficult. The primary importance in the detection of caries is given to early diagnosis, when the patient does not complain. This is due to the fact that previously identified defects are easier to eliminate, and thus it is possible to prevent the progression of the pathological process. Due to the early manifestation of the carious process, in the absence of diagnosis, an increase in the intensity of dental caries from KPA 2.7 (2004-2006) to KPA 3.5 (2011) is possible in all age groups of the population. It should be assumed that the fundamental solution to this problem is to study modern diagnostic approaches and its subsequent implementation to identify the early stages of the carious process. The main methods of caries diagnosis include: survey (anamnesis

of the disease, anamnesis of life), visual examination, probing, percussion, determination of tooth mobility. There are also additional methods such as vital staining, radiography, selective tooth separation (access to the proximal surfaces of the lateral teeth), electroodontometric diagnostics, ultrasound, etc. Visual examination is considered the very first clinical method of caries diagnosis used in practice. Until 1920, it included a combination of visual and tactile dental examination using a probe, and clinical diagnosis was based solely on this method. But the disadvantages of visual inspection prevail over the advantages: insufficient information content, inability to identify the maximum number of carious cavities. Due to the rapid development of dentistry in general, it would be a mistake to rely only on examination when making a diagnosis, therefore it is combined with other diagnostic methods (vital staining, radiography). The vital staining method is used for the differential diagnosis of caries and non-carious lesions. This method is based on the penetration of a dye (1% methylene blue solution, 0.5% methylene red solution) into demineralized enamel at the initial stage of the pathological process, when enamel permeability increases due to an increase in the number of pores, thereby the dye is absorbed, and the lesion is colored in the color of the dye. This method is very convenient, visual and economical, but it also has its drawbacks: the inability to assess the depth of the lesion, difficulties in diagnosing caries in hard-to-reach surfaces. To this day, visual diagnostics remains one of the main ways to diagnose caries, but more and more experts recognize that basic methods are not enough to detect early carious lesions, especially in hard-to-reach places. Therefore, the solution to this problem was the introduction of hardware methods of caries diagnosis into clinical practice. The very first and easily accessible instrumental method is radiography, which is quite widely used nowadays. The following radiological methods are most often used in dental practice Methods: intra- and extraoral radiography, survey radiography, long-focus radiography. Interproximal radiography, as one of the reliable methods, refers to intraoral radiography and allows you to obtain an image of the marginal sections of the alveolar processes of the upper and lower jaws without distortion, to visualize defects in the approximal surfaces of the teeth. Radiography, as a method of diagnosing caries, makes it possible to identify hidden and secondary carious cavities, but it has a number of disadvantages: the negative effect of ionizing radiation, the inability to detect initial caries and foci of enamel demineralization, difficulties in determining the depth of damage by the pathological process, static images. Despite all the disadvantages of X-ray diagnostics, scientists are developing the latest methods that doctors are already using and will use in the near future, but so far they are rare and remain expensive. The next method used in the clinical practice of dentists is electro-dental diagnostics (EDI), based on determining the threshold of pulp sensitivity to electric current. The essence of EDI is to irritate the tooth pulp with an electric current and determine the minimum current strength before the first mild pain occurs. Thus, it is possible to differentiate the forms of caries and identify its complications. The disadvantages of this method include: the inability to detect the initial caries, determine the depth, topography and degree of activity of the carious process, the difficulty of working with the device and interpreting the results. Currently, electro-dental diagnostics is considered an inhumane method of detecting caries in children due to a painful reaction. The method of laser fluorescence using the diagnostic device DIAGNOdent (KaVo, Germany) – allows you to identify changes in the structure of tooth tissues during demineralization mainly on the occlusal surfaces of teeth. The laser photodiode of the device emits light waves with a length of 655 nm (red radiation) and a threshold power of 1 MV onto the tooth surface. Organic and inorganic molecules of the hard tissues of the tooth absorb light, and the device reflects it in the infrared spectrum. As a result, the device outputs values in numbers and notifies with an audio signal. For a higher accuracy of the readings, it is recommended to clean and dry the tooth before diagnosis. In case of poor oral hygiene, the

presence of abundant plaque, the device may give incorrect values. The main advantages of this method are ease of use, absence of harmful ionizing radiation, detection of hidden carious cavities, and recognition of fissure caries. Also, with the help of digital and audio identification, it is clearly possible to determine the severity of the disease. However, the device is not designed to diagnose the contact surfaces of teeth, since in most cases it is not possible to insert the tip of the device into the interdental space. This significantly reduces the scope of this device. Another option for caries diagnosis is the Quantitative Light-induced Fluorescence (QLF-method) method. The apparatus of quantitative light-induced fluorescence is based on a decrease in the ability of dental hard tissues to fluoresce during demineralization. The device is a portable system for intraoral examination with an incoherent light source and a filter system to replace the laser source. The light-emitting system generates blue light with an intensity of 370 nm, which is transmitted through a liquid-filled light guide. During the examination, the tooth absorbs a blue pulse stream, thereby healthy teeth glow green, and those affected by caries glow red. The image of the fluorescent tooth is transmitted to the monitor using a video camera through a high-pass filter. A color image showing the condition of the patient's oral cavity is displayed on the screen. The device is designed for early detection of carious lesions due to loss of fluorescence in demineralization zones, determination of the localization, depth and size of the carious cavity, as well as the severity of the pathological process.

Conclusions.

The main method of detecting caries is a thorough visual examination using a dental probe and a mirror. Additional methods include vital staining, radiography, and electro-dental diagnostics (EDI). Modern hardware diagnostic methods include the method of laser fluorescence using the diagnostic device DIAGNOdent (Kavo, Germany), the method of quantitative light fluorescence (QLF method). Hardware diagnostic methods make it possible to identify and evaluate carious lesions at the earliest stages, which is a huge advantage in prescribing timely treatment using non-invasive caries treatment methods.

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