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## LOCAL ANESTHESIA IN CHILDREN'S DENTAL RECEPTIONS

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**Abstract. Introduction.** Pain is an important diagnostic criteria in dentistry. It can be both local and diffuse in nature, and its intensity indicates on the activity of the pathological process. Therefore, local anesthesia is one of the most common procedures at the dentist, and local anesthetics- one of the most commonly used methods in the daily practice of a dentist. In addition, local anesthesia justifies expediency of its application: in the treatment of separate teeth (carious, pulpitis or periodontitis), treatment of oral mucosa, difficult eruption of teeth (retained teeth), orthodontic pathologies, surgical interventions. After all, often without its observance of the majority modern treatment protocols are impossible.

*The purpose of the study:* To assess the importance and feasibility of application local anesthesia at the pediatric dental clinic, analyzing experience of domestic and foreign researchers. As well as complications which may arouse as a result of inadequate conduct.

*Materials and methods:* Domestic and foreign scientific sources publications on the effectiveness of local anesthesia on daily dental reception. Used in the study semantic method and structural-logical analysis. Methodical basis research has become a systems approach.

*Conclusions.* Local anesthesia is indispensable manipulation in pediatric dentistry. The question of improving the methods of anesthesia on children's reception is relevant today and needs constant improvements for the ensure painless dental care interventions taking into account the psycho-emotional state, somatic status, prevention of complications and undesirable results.

**Key words:** child, dental reception, application anesthesia, infiltrative anesthesia, anesthetic, pain, hematoma.

### **Місцеве знеболення на дитячому стоматологічному прийомі**

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**Резюме.** *Вступ.* У стоматології біль є важливим діагностичним критерієм. Він може мати як локальний, так і розлитий характер, а його інтенсивність вказує на активність патологічного процесу. Тому місцева анестезія є однією з найпоширеніших процедур на стоматологічному прийомі, а місцеві анестетики – одними з найбільш часто використовуваних лікарських препаратів у щоденній практиці лікаря-стоматолога. Крім того, місцеве знеболення виправдовує доцільність свого застосування: при лікуванні окремого зуба (каріозного, пульпітного або періодонтитного), лікуванні захворювань СОПР, утрудненому прорізуванні зубів (ретиновані зуби), ортодонтичних патологіях, необ'ємних хірургічних втручаннях. Адаже часто без її проведення дотримання більшості сучасних протоколів лікування є неможливим.

*Мета дослідження.* Оцінити значення та доцільність застосування місцевого знеболення на дитячому стоматологічному прийомі, аналізуючи напрацювання вітчизняних і закордонних дослідників, а також ускладнення, які можуть виникати в результаті неадекватного його проведення.

*Матеріали та методи.* Вітчизняні та зарубіжні джерела наукових публікацій щодо ефективності застосування місцевого знеболювання на щоденному стоматологічному прийомі. В ході дослідження використано бібліосемантичний метод і структурно-логічний аналіз. Методичною основою дослідження став системний підхід.

*Висновки.* У дитячій стоматології місцева анестезія є незамінною маніпуляцією, тому питання стосовно вдосконалення методів знеболення на дитячому прийомі є актуальним на сьогоднішній час і потребує постійного вдосконалення для забезпечення безболісного проведення стоматологічних втручань з урахуванням психоемоційного стану, загальносоматичного статусу, попередження виникнення ускладнень та небажаних результатів.

**Ключові слова:** дитина, стоматологічний прийом, аплікаційне знеболення, інфільтраційне знеболення, анестетик, біль, гематома.



## Introduction

Despite the rapid development of medicine, the introduction of new methods in practical health care, in particular in the field of dentistry, for the latter ten years there was a progressive increase in morbidity among children and adolescents with major dental diseases. Results of epidemiological studies conducted in different regions of Ukraine, indicate an increase in the prevalence and intensity of the main manifestations dental diseases. Usually, most dental interventions require local anesthesia, which is the initial manipulation in the treatment of these pathologies. In addition, the development of dentistry and outpatient anesthesiology makes it possible to conduct more and more at once medical manipulations. Therefore, the question of the technique of anesthesia, drugs used as an anesthetic solution, and methods are controversial among dentists and are relevant character [5-7].

## The aim of the study

Assess the importance and appropriateness of local anesthesia on pediatric dentistry and complications that may occur in results of its inadequate conduct, analyzing the work domestic and foreign researchers.

## Materials and methods

Domestic and foreign sources of scientific publications on effectiveness applications of local anesthesia on a daily dental basis.

In the course of the research the bible semantic method and structural logical analysis. The methodological basis of the study has a systematic approach. This study is a fragment of the research of the Department of Pediatric Dentistry of the Faculty of Dentistry, Uzhhorod National University: Comprehensive justification for providing dental care to children who living in conditions of biogeochemical deficiency of fluorine and iodine (topic code - 616.31; 617.52-089,616.31-053.2 / 5, № state registration 0119U101329).

## Research results

Anesthesia is the loss of pain sensitivity that is achieved by the complex measures aimed at temporarily excluding the central or peripheral nervous system. Depending on this, anesthesia is divided into general (anesthesia) and local [1].

Despite significant advances in general anesthesia and application advanced drugs, it should be noted that the main method of anesthesia in the practice of a dentist is still local anesthesia. After

all, in contrast to general anesthesia, during which the patient is immersed in a deep medical sleep and does not respond to external stimuli, local anesthesia - is a way of pain relief blocking innervation at the site of surgery. Given this, the present type of anesthesia is very popular and is widely used in both conditions hospital and clinic, providing anesthesia in the treatment of caries and its complications, local treatment of oral mucosa, orthodontic diseases manipulations in case of anomalies of positions of separate groups of teeth, volume surgical interventions [2, 9, 10].

The peculiarity of local anesthesia is that it eliminates 100% pain, while maintaining sensory perception. That is the patient may experience jolts, vibrations, pressure and so in some cases tactile sensations are perceived by patients as unpleasant. The task of the dentist - use the optimal method of anesthesia that will provide the patient is protected not only from pain but also from discomfort, stress during carrying out medical manipulations [3].

Local anesthesia has a number of advantages: it does not require it expensive equipment, ease of execution, minimal toxicity. After the patient does not need surgery under local anesthesia special medical supervision and may be released home.

There is a day of knowledge of the principles of local anesthesia, its types and methods absolutely necessary for a dentist of any profile, especially pediatric, because the trip to the dentist children are very emotional, so medical manipulations should be completely painless [18-20].

The mechanism of action of local anesthesia is based on the speed of onset anesthetic effect, depth, duration and maximum effectiveness. Given the fact that local anesthetics are distributed more quickly vascular system, including capillaries, in the area of anesthesia is appropriate comparison and determination of the most effective method of anesthesia, taking into account the amount of necessary manipulations and topographic and anatomical features of the area where pain sensitivity should be blocked [8].

To date, depending on the scope of the intervention, y the following types of local anesthesia are distinguished in dental practice:

- application;
- infiltrative;
- conductive;
- intraarticular;
- trunks. [10].

For example, application anesthesia is used to provide superficial anesthesia of the gums and



mucous membranes. For the treatment of caries, pulpitis, periodontitis use infiltration anesthesia. However, when treatment of masticatory teeth of the lower jaw this type of anesthesia is not provides complete anesthesia, so it is effective to conduct conductor or intraligamentary anesthesia. Intraligamentary anesthesia is injection into the circular ligament of the tooth, and conductive anesthesia involves the introduction anesthetic in the area where the nerve is located, for anesthesia of a large area operating field. The least used method of local anesthesia there is stem anesthesia, in which the drug is injected into the base of the skull, as a result which blocks all nerve endings of the trigeminal nerve. This method used in the hospital in exceptional cases (neuralgia, high pain sensitivity in the patient) [11].

In addition, it should be noted that the use of anesthesia with the use application and infiltration anesthesia may not always solve the problem complete numbness, because preschool children (from 1 year to 5 years) do not always respond adequately to the procedure of injection and onset anesthesia, because it is an additional stressful situation for them. Therefore for correction of psycho-emotional state, especially in the group of children with concomitant pathology - chronic systemic diseases, psycho-emotional instability, allergies - necessary sedative training – tablets premedication in combination with local anesthesia or treatment under sedation [13].

Despite the benefits of local anesthesia, it is worth remembering a number of complications that may result from inadequate performance of this manipulation, and can be both general and local.

The main percentage of complications is due to allergic and toxic reactions can be caused both by violation of the technique of execution, and pharmacological action of anesthetics that develop or IgE-dependent type and manifested by Quincke's edema, urticaria, asthma attacks, anaphylactic shock, or the mechanism of delayed-type hypersensitivity (at application use of drugs) which are shown by contact dermatitis; Types 2 and 3 - most often a reaction to preservatives to epinephrine (especially sulfites). At the same time toxic reactions arise at introduction a large number of local anesthetics and lead to neurological and cardiac manifestations [4].

Toxic reactions to local anesthetics in children are quite common in most cases occur during mandibular anesthesia, when which the doctor usually injects from 2/3 to the carpule (1.7 ml) of local anesthetic.

This amount of drug in the anatomically dangerous area in a child significantly increases the risk of drug intoxication. It was noted that in many cases toxic reactions to a local anesthetic have two stages. The first stage characterized by severe nervous excitement of the child, tachycardia and hypertension, and passes relatively quickly. In the second stage, the picture is reversed - bradycardia, hypotension, severe apathy, the child reacts very sluggishly to external stimuli, falling asleep in a chair [12,15].

In order to prevent this complication during anesthesia on the lower jaws in children, it is recommended to apply the so-called «rule of tens». Essence it is as follows: if the number of full years of the child in the amount of the ordinal number of the tooth is given 10 or less, then for anesthesia of this tooth there will be enough infiltration anesthesia. For example, a 4-year-old child is needed perform a vital amputation or extirpation of the pulp in the 84th tooth, respectively IV tooth on the lower jaw on the right, its serial number - IV. We count:  $4 + IV = 8$ , which is less than 10. Therefore, for anesthesia 4 teeth in a 4-year-old child is enough perform infiltration anesthesia according to standard methods. With just one injection from the cheek will be enough. If you need to remove tooth - it is recommended to add a small amount of anesthetic on the lingual side [16].

Most local complications associated with the use of local anesthetics, short-term, although inconvenient and disturbing to the patient. Some last only a few seconds (pain and burning when injected), others – from several hours to several days (trismus, hematoma, infection, edema, paresis facial nerve), while paresthesia usually lasts for several days, in some cases it may be permanent [14,17].

### Conclusions

Carrying out any kind of treatment among children and adolescents is more complex, and the percentage of failures and complications is higher than in adult patients with similar interventions. This is primarily due to anatomical, physiological and psycho-emotional characteristics of the child that should be considered in the pediatric practice of the dentist. It is of paramount importance in the matter of anesthesia, and the younger the child, the more likely to occur.

To date, the topical issue is local anesthesia among children under 4 years. Because it is not separately designed effective and safe means of local anesthesia at this age group. As clinical experience shows, the need for local anesthesia arises



when children 4 years and younger are treated. In the practice of most doctors who work with children, there are many cases where medical intervention is required anesthesia. However, the duration and complexity of the intervention is not always justified putting the child under anesthesia. The most optimal solution in this situation remains to conduct injection anesthesia, similar to how it is done in older children, but always taking into account the topographic and anatomical features of the maxillofacial area in this age period, general somatic status, choice of anesthetic, its quantity and availability substances that prolong anesthesia.

In addition, the use of anesthesia in pediatric dentistry associated with a high risk of allergic or

toxic reactions. So precise collection of anamnesis and allergy testing for selection is mandatory safe anesthetic, taking into account the dose of the drug, the rate of its administration will be the clue to a successful result.

The use of modification methods of local anesthesia is most common used at the daily dental office, which is justified expediency of its application.

Thus, there is no doubt that local anesthesia is in pediatric dentistry is an indispensable manipulation. Therefore, the question of improving methods anesthesia at a children's reception is relevant today and needs continuous improvement to prevent complications and unwanted results.

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