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Choice of dental treatment in adolescent children based on the results of monitoring brain oxygen saturation - cerebral oximetry

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To solve the problem of choosing the method of oral cavity sanitation, it is necessary to determine a safe period of time for performing dental procedures of varying severity and the number of visits. This will provide the opportunity to formulate clear indications for oral sanitation in conditions of general anesthesia in order to minimize the risk of cognitive dysfunctions against the background of hypoxic damage to the brain. The purpose of the study: to establish a safe period of time for various dental procedures in school-aged children on an outpatient dental appointment based on an objective method for assessing brain oxygen saturation - cerebral oximetry; determine the indications for the rehabilitation of the oral cavity under general anesthesia. Dental examination and dental procedures of varying severity were performed for 102 children under the age 12-18 years (424 teeth were treated) at the Dental Medical Center at the Bogomolets National medical University. In order to determine the oxygen saturation of the brain, the cerebral oximetry method was used. To predict cognitive changes against the background of organic brain disorders, we used the results of J. Meixensberger et al. (1998), where the main task of the dentist was considered to prevent a decrease in cerebral oximetry by more than 20%. Statistical processing of the results was performed using Microsoft Office Excel. It is established that the timing of the manipulations associated with preventive measures does not depend on the type of phobias. In children with a "light" temperament, it is 34'-35', with a "complex" temperament and temperament it is "warm up for a long time" - 30'. In children with an "easy" temperament, the safe period of time for conducting manipulations that are associated with the treatment of caries and its complications, regardless of the type of phobia, is 42'. In children with a temperament "a long time warms up", a safe period of time for carrying out manipulations that are associated with the treatment of caries and its complications, regardless of the type of phobia, is 37'. In children with a "complicated" temperament, a safe period of time for conducting manipulations that are associated with the treatment of caries and its complications in the presence of "elementary" phobias is 35', in the presence of "cryptogenic" phobias - 30'. Indications for rehabilitation of the oral cavity in conditions of general anesthesia at average caries is - children with a "light" temperament, regardless of the type of phobia with a $DMF \geq 8$; children with a "complicated" temperament and "elementary" phobias with a $DMF \geq 2$; "cryptogenic" phobias with $DMF \geq 1$; children with a temperament "warm up for a long time" regardless of the type of phobia with a $DMF \geq 2$; for deep caries - children with a "light" temperament, regardless of the type of phobia with a $DMF \geq 4$; children with a "complicated" temperament and "elementary" phobias with a $DMF \geq 2$; "cryptogenic" phobias with $DMF \geq 1$; children with a temperament "warm up for a long time" regardless of the type of phobia with a $DMF \geq 1$; for chronic fibrous pulpitis - children with a "light" temperament, regardless of the type of phobia with a $DMF \geq 6$; children with a "complicated" temperament, regardless of the type of phobia with a $DMF \geq 1$; children with a temperament "warm up for a long time" regardless of the type of phobia with a $DMF \geq 2$; at chronic periodontitis - children with a "light" temperament, regardless of the type of phobia with a $DMF \geq 6$; children with a "complicated" temperament and "elementary" phobias with a $DMF \geq 2$; "Cryptogenic" phobias with $DMF \geq 1$; children with a temperament "warm up for a long time" regardless of the type of phobia with a

DMF $\geq$ 1. Thus, the treatment of teeth in the conditions of general anesthesia in children aged 12-18 years provides more radical methods of treatment with the obligatory follow-up consultation of the orthodontist in order to preserve the chewing, articulatory functions and to ensure the full development of the dental apparatus.

Keywords: caries, cerebral oximetry, children, general anesthesia, dental procedures.

Introduction

Despite age, fear of feeling pain is a strong traumatic factor for the as yet unformed psyche of adolescents. Toothache for children at this age is a familiar phenomenon. The sensation of pain, even when forming a constant bite, forms "cryptogenic" phobias. Although dentists pay attention to an individual psychological approach to each patient, dental treatment with retention of cognitive functions is a difficult task for the dentist, which sometimes leads to the choice of a method of dental treatment in conditions of general anesthesia [6, 12].

The main question parents ask their dentist is: "which is safer for the child: the stress that accompanies the child at the dental appointment or the risks that may occur when performing oral rehabilitation in the context of general anesthesia?". In both cases, there are risks of cognitive dysfunction on the background of hypoxic brain damage [2-4, 7, 11, 14, 17]. As in the treatment of teeth without general anesthesia - against the background of stress, and in the treatment of teeth under general anesthesia - when introducing drugs, the dentist needs to take into account not only the dental status of the child (intensity of caries, caries, specific weight of complicated caries) to solve this issue. its psychological state (age peculiarities of thinking, type of temperament, type of phobias), somatic status (age peculiarities of the structure of the respiratory tract, the frequency of acute respiratory diseases), as well as the technical conditions fulfilled Dental manipulation (ventilation of the room, inclination of the head (to prevent overpressure of cranial vessels), mechanical overlapping of the oral cavity with dental intervention, the possibility of the child to open his mouth wide).

Aim of the study: to establish a safe period of time for various dental manipulations in school-age children on an outpatient dental treatment on the basis of an objective method for assessing brain oxygen saturation - cerebral oximetry; to determine the indications for the rehabilitation of the oral cavity under general anesthesia.

Materials and methods

Dental examination and dental manipulations of varying degrees of complexity were performed on 102 children aged 12-18 years (424 teeth were treated) at the Dental Medical Center at the Bogomolets National medical University. The dissertation is a fragment of the research topic of the Department of Pediatric Therapeutic Dentistry and Dental Disease Prevention of the Bogomolets National medical University (state registration number 0119U100454).

The children were divided into two groups, depending

on the choice of treatment method: I group consisted of children, rehabilitation of the oral cavity which was carried out in conditions of general anesthesia (30 children); II group consisted of children, the rehabilitation of the oral cavity was performed without general anesthesia (72 children).

All children were identified psychological typological features of personality (type of temperament and type of phobias) [12].

For the method of cerebral oximetry [1, 8, 16] used the device for monitoring blood gas: 4-channel regional oximeter with EQUANOXTM technique, Bluetooth wireless technology and RS-232 (model 7600) (State Registration Certificate № 12580/2013. Manufacturer: Nonin Medical, Inc., USA). To predict hypoxic brain lesions, we used the results of studies by J. Meixensberger et al. (1998), where the main task of the dentist was to prevent a decrease in cerebral oximetry by more than 20% [9].

Statistical processing of the results was performed using Microsoft Office Excel. The Student's test was used to compare quantitative traits between groups. Pearson's correlation coefficient was determined [5] to identify correlation relationships.

Results

According to the results of the clinical examination, it was found that in children aged 12-18 years the acute caries course prevails - 76.0%. Chronic caries progress was set at 24.0%. Surface (35.7%) and medium (28.8%) caries are more commonly observed in the depth of the lesion. In group I, acute caries occurs in 80.5%, chronic - in 19.4%. Surface caries (33.3%) are the most common in terms of depth of damage. The second place - medium and deep caries (25.0%). In group II, acute caries occurs in 80.2%, chronic - in 19.7%. According to the depth of lesions, surface caries - 36.3%; the medium caries - 30.6%.

Complications of the carious process were observed in the first group of children in 59.2%, in the second group - in 40.8%. Pulpitis was diagnosed in 56.8% of the affected teeth. Of these: acute serous pulpitis - 15.2%, chronic fibrous pulpitis - 33.6%. Periodontitis was diagnosed in 43.2%. Of these: in the remission stage - 28.8%, in the exacerbation stage - 22.4%. In group I, pulpitis - 51.3% (acute serous - 10.8%, chronic fibrous - 35.1%); periodontitis - 48.6% (chronic granulating in the exacerbation stage - 27.0%, chronic granulating in the remission stage - 21.6%). In group II, pulpitis - 64.7% (acute serous - 21.6%, chronic fibrous - 31.4%); periodontitis - 35.3% (chronic granulating in the exacerbation stage -

Fig. 1. Indicators of cerebral oximetry in children aged 12-18 years.

15.4%, chronic granulating in the remission stage - 20.0%).

Analysis of cerebral oximetry showed that when performing non-invasive methods of dental intervention associated with preventive measures, the reduction of cerebral oximetry by 21.6% occurs for 35 minutes ($rSO_2=60.12\pm1.55\%$ at initial $rSO_2=76.65\pm0.89\%$ (1'-4')). When performing procedures related to caries treatment, cerebral oximetry reaches a critical level of 42 minutes. The decrease in rSO_2 occurs by 22.4%

($rSO_2=59.00\pm0.97\%$ at initial $rSO_2=75.70\pm0.98\%$ (1')). When performing procedures related to the treatment of complicated caries, the reduction of cerebral oximetry by 23.5% occurs at 42 minutes ($rSO_2=58.14\pm0.37\%$ at initial $rSO_2=75.70\pm0.84\%$ (1')).

Analysis of cerebral oximetry in children, depending on the type of temperament and type of phobias is presented in Figure 1.

Note that when performing dental procedures

associated with preventive measures, reducing cerebral oximetry does not depend on the type of phobia. The decrease in cerebral oximetry is 34-35 minutes by 21.5% ($rSO_2=60.12\pm1.46\%$ ($rSO_2=60.12\pm1.46\%$ at initial $rSO_2=76.62\pm1.37\%$ (1'-4')). $rSO_2=76.62\pm1.37\%$ (1'-4')).

When performing dental manipulations related to the treatment of caries, the reduction of cerebral oximetry in children with "elementary" phobias occurs for 42 minutes by 22.4% ($rSO_2=59.00\pm1.00\%$ at initial $rSO_2=76.00\pm0.48\%$ (1')), in children with "cryptogenic" phobias they also increased by 21.7% for 42 minutes ($rSO_2=59.00\pm1.00\%$ at initial $rSO_2=75.40\pm1.24\%$ (1'-6')).

When performing dental manipulations related to the treatment of complicated caries, the reduction of cerebral oximetry in children with "elementary" phobias occurs for 42 minutes by 23.5% ($rSO_2=58.14\pm0.37\%$ at initial $rSO_2=76.00\pm0.77\%$ (1'-2')), in children with "cryptogenic" phobias - for 42 minutes by 20.7% ($rSO_2=58.14\pm0.37\%$ at initial $rSO_2=73.30\pm0.79\%$ (1')).

Thus, we set a safe amount of time for dental surgery at the outpatient reception for adolescent children (Table 1).

It should be noted that the decrease in cerebral oximetry at each repeated visit in children of this age category occurs depending on the temperament and the depth of dental intervention. In non-invasive methods of intervention: at a "light" temperament, the decrease in cerebral oximetry at each repeated visit - occurs at 0.46', at a "complex" temperament - at 1.12', at a temperament "warms up for a long time" - by 1.45'. In invasive methods of intervention related to the manipulation of treatment of caries and its complications: at "light" temperament, the decrease in cerebral oximetry at each repeated visit is 0.59', at "complex" temperament - by 1.34', at a temperament "warms up for a long time" - at 1.47'.

Discussion

To solve the problem of the choice of the method of oral cavity repair it is necessary to determine a safe period of time of dental manipulations of different degree of complexity and the number of visits, which can be carried out in succession taking into account the psychological characteristics of children in different age periods [10, 13, 15]. This will give clear boundaries to the possibility of

performing oral remediation without general anesthesia and the ability to formulate clear indications for oral remediation under general anesthesia in order to minimize the risk of cognitive dysfunction on the background of hypoxic brain damage.

Treatment of initial and superficial caries by non-invasive methods is fully integrated into the time interval 30'-35' and consisted of the following manipulations: *treatment of initial caries* - professional oral hygiene; the use of fluoride-containing drug of local action (fluorine-containing varnishes, deep fluoridation) with subsequent repetitions during the dispensary observation of the child; "Tooth Mouse" gel applications at home; recommendations for parents to care for the oral cavity of the child, followed by controlled brushing; *treatment of superficial caries* - professional oral hygiene; overlapping of the affected areas of enamel with glass ionomer cement after minimal manual preparation; "Tooth Mouse" gel applications at home; recommendations for parents to care for the oral cavity of the child, followed by controlled brushing.

According to the results of treatment of initial and superficial caries in different conditions we have not found a significant difference. In the treatment of initial caries in the 1st group of children complications were found in 25.0% of treated teeth. In the second group - 21.5%. In the treatment of superficial caries, this indicator amounted to 16.7% in the first group and 20.0% in the second group. Therefore, the results of treatment of initial and superficial caries in permanent teeth in children aged 12-18 years does not depend on the treatment conditions.

Treatment of medium and deep caries of permanent teeth at the stage of root growth in an outpatient setting. The minimum time that can technically be performed for the treatment of medium caries and deep caries in permanent teeth with the placement of a dental restoration from a photopolymer composite) in children aged 12-18 years 30'. In children with a "light" temperament, regardless of the type of phobias, it is possible to treat 8 teeth ($42'-8 \times 1.46'=30.52'$). In children with "complex" temperament and "elementary" phobias, it is possible to treat 2 affected teeth ($35'-2 \times 2.26'=30.48'$), with "cryptogenic" phobias - no more than 1 tooth ($30'-2.26'=27.74'$). In children with a "warms up for a long time" temperament, no more than 2 teeth may

Table 1. Optimal time interval of various dental manipulations in children aged 12-18 years on outpatient dental reception depending on the type of temperament and type of phobias.

Preventive measures					
"light" temperament		"complex" temperament		temperament "warms up for a long time"	
"elementary" phobias	"cryptogenic" phobias	"elementary" phobias	"cryptogenic" phobias	"elementary" phobias	"cryptogenic" phobias
34'-35'	34'-35'	30'	30'	30'	30'
Treatment of caries					
42'	42'	35'	30'	37'	37'
Treatment of complicated caries					
42'	42'	35'	30'	37'	37'

be treated regardless of the phobia type (37-2 x 3.32'=30.36').

Treatment of medium caries of permanent teeth at the stage of root stabilization, which was carried out under general anesthesia, consisted of performing the following manipulations: professional oral hygiene; preparation and filling of carious cavities with composite (in chronic caries); preparation and filling of carious cavities by the compomer (in case of acute caries and doubtful diagnosis regarding the depth of the lesion); preventive coverage of intact GIC fissures; recommendations for parents to care for the oral cavity of the child, followed by controlled brushing.

In case of difficulty in determining the depth of the lesion, deep/medium caries are treated according to the protocols of treatment of acute deep caries.

According to the results of treatment of medium caries, a significantly lower percentage of complications arising from the rehabilitation of the oral cavity in conditions of general anesthesia (11.1%) was established than with the rehabilitation of the oral cavity in the outpatient setting (25.0%) ($p \leq 0.05$).

Treatment of deep caries in conditions of general anesthesia consisted of performing the following manipulations.

Treatment of acute deep caries is carried out in stages I or II depending on the intensity of the caries. In Stage I, we follow a protocol for the treatment of permanent dental caries for medium caries. *In Stage II: Stage I* - occupational oral hygiene; after preparation a long-term therapeutic dental restoration (zinc oxide-eugenol paste); *Stage II (3-6 months after)* - professional oral hygiene; complete removal of the ZOE, permanent restoration in the sandwich technique or with gasket with GIC and composite; preventive coverage of intact GIC fissures; recommendations for parents to care for the oral cavity of the child, followed by controlled brushing.

The treatment of chronic deep caries consisted of the following manipulations - professional oral hygiene; preparation and filling of carious cavities composite/restoration type sandwich with gasket; preventive coverage of intact GIC fissures; recommendations for parents to care for the oral cavity of the child, followed by controlled brushing.

According to the results of deep caries treatment, a significantly lower percentage of complications occurring in the rehabilitation of the oral cavity in conditions of general anesthesia (11.1%) than in the rehabilitation of the oral cavity in outpatient conditions (28.1%) ($p \leq 0.01$).

Treatment of chronic fibrous pulpitis and chronic granulating periodontitis of permanent teeth at the stage of the formed root in an outpatient setting. In children with "light" temperament, regardless of the type of phobias, it is possible to treat 6 teeth in 3 visits (18 visits in total), affected by chronic pulpitis and/or chronic periodontitis (42'-12 x 0.59'=34.39). With "complex" temperament in the presence of "elementary" phobias, it is possible to treat chronic

Table 2. Substantiation of the choice of method of treatment of permanent teeth in children aged 12-18 years depending on temperament and type of phobias.

Diagnosis	Temperament	Phobias	Method of treatment	
			on an outpatient basis	in the conditions of general anesthesia
Initial caries	"light"	"elementary"	+	-
		"cryptogenic"		
	"complex"	"elementary"	+	-
		"cryptogenic"		
	"warms up for a long time"	"elementary"	+	-
		"cryptogenic"	+	-
Superficial caries	"light"	"elementary"	+	-
		"cryptogenic"		-
	"complex"	"elementary"	+	-
		"cryptogenic"		-
	"warms up for a long time"	"elementary"	+	-
		"cryptogenic"	+	-
Average caries	"light"	"elementary"	DMF $\leq$ 8	DMF $\geq$ 8
		"cryptogenic"		
	"complex"	"elementary"	DMF $\leq$ 2	DMF $\geq$ 2
		"cryptogenic"	DMF=1	DMF $\geq$ 1
	"warms up for a long time"	"elementary"	DMF $\leq$ 2	DMF $\geq$ 2
		"cryptogenic"		
Deep caries	"light"	"elementary"	DMF $\leq$ 4	DMF $\geq$ 4
		"cryptogenic"		
	"complex"	"elementary"	DMF $\leq$ 2	DMF $\geq$ 2
		"cryptogenic"	DMF=1	DMF $\geq$ 1
	"warms up for a long time"	"elementary"	DMF=1	DMF $\geq$ 1
		"cryptogenic"	-	DMF $\geq$ 1
Chronic fibrous pulpitis	"light"	"elementary"	DMF $\leq$ 6	DMF $\geq$ 6
		"cryptogenic"		
	"complex"	"elementary"	DMF=1	DMF $\geq$ 1
		"cryptogenic"	-	DMF $\geq$ 1
	"warms up for a long time"	"elementary"	DMF $\leq$ 2	DMF $\geq$ 2
		"cryptogenic"		
Chronic periodontitis	"light"	"elementary"	DMF $\leq$ 6	DMF $\geq$ 6
		"cryptogenic"		
	"complex"	"elementary"	DMF $\leq$ 2	DMF $\geq$ 2
		"cryptogenic"	DMF=1	DMF $\geq$ 1
	"warms up for a long time"	"elementary"	DMF=1	DMF $\geq$ 1
		"cryptogenic"	-	DMF $\geq$ 1

pulpitis in the 1st tooth (35'-3 x 1.34=30.98'). In the presence of "cryptogenic" phobias, it is not possible to carry out stomatologic manipulation related to the treatment of complicated caries at the outpatient dental reception. In children with "warms up for a long time" temperament,

treatment of chronic pulpitis and/or chronic periodontitis not more than in 2 teeth (5 visits) is possible regardless of temperament ($37^{\circ}-5 \times 1.47^{\circ}=29.65$).

Treatment of chronic fibrous pulpitis of permanent teeth at the stage of root growth under general anesthesia consisted of performing the following manipulations: professional oral hygiene; pulp extraction, chemomechanical treatment of root canals, root canal filling, permanent composite dental restoration; recommendations for parents to care for the oral cavity of the child, followed by controlled brushing.

If complete endodontic treatment cannot be performed, pulp amputation can be limited. The execution protocol coincides with the protocol of treatment of pulpitis in the tooth with incomplete root formation.

According to the results of treatment of chronic fibrous pulpitis, a significantly lower percentage of complications arising from the rehabilitation of the oral cavity in conditions of general anesthesia (17.0%) was established than when the rehabilitation of the oral cavity in ambulatory conditions (37.5%) ($p \leq 0.01$).

Treatment of chronic periodontitis in teeth with unformed

roots requires several visits, which is technically impossible to perform under general anesthesia. Therefore, teeth with chronic granulatory periodontitis in teeth with unformed roots are subject to removal under general anesthesia.

Given the small volume of bone destruction, the treatment of chronic periodontitis was performed as follows: professional oral hygiene; chemomechanical treatment of root canals; root canal obturation; restoration of composite; recommendations for parents to care for the oral cavity of the child, followed by controlled brushing.

Generalized results of substantiation of the choice of method of treatment of permanent teeth at the stage of the formed root in children aged 12-18 years are presented in Table 2.

Conclusions

Treatment of teeth in conditions of general anesthesia in children aged 12-18 years provides more radical methods of treatment with the obligatory follow-up consultation of the orthodontist in order to preserve the chewing, articulatory functions and to ensure the full development of the dental-jaw apparatus.

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ВИБІР УМОВ ПРОВЕДЕННЯ ЛІКУВАННЯ ЗУБІВ У ДІТЕЙ ПІДЛІТКОВОГО ВІКУ НА ОСНОВІ РЕЗУЛЬТАТІВ МОНІТОРИНГУ КИСНЕВОГО НАСИЧЕННЯ ГОЛОВНОГО МОЗКУ - ЦЕРЕБРАЛЬНОЇ ОКСИМЕТРІЇ

Коваль О.І.

Для вирішення проблеми вибору методу санації порожнини рота необхідно визначити безпечний проміжок часу виконання стоматологічних маніпуляцій різного ступеня складності та кількість відвідувань. Це надасть можливість сформулювати

чіткі показання до проведення санації порожнини рота в умовах загального знеболення з метою мінімізувати ризики виникнення когнітивних дисфункцій на фоні гіпоксичного ураження головного мозку. Мета дослідження: встановити безпечний проміжок часу проведення різних стоматологічних маніпуляцій у дітей шкільного віку на амбулаторному стоматологічному прийомі на основі об'єктивного методу оцінки кисневого насичення головного мозку - церебральної оксиметрії; визначити показання для проведення санації порожнини рота під загальним знеболенням. Стоматологічне обстеження та проведення стоматологічних маніпуляцій різного ступеня складності проведено 102 дітям віком 12-18 років (проліковано 424 зуба) на базі Стоматологічного медичного центру при Національному медичному університеті імені О.О. Богомольця. З метою визначення насичення киснем головного мозку застосовували метод церебральної оксиметрії. Для прогнозу когнітивних змін на фоні органічних порушень головного мозку використовували результати досліджень J. Meixensberger зі співавторами (1998), де головним завданням стоматолога було не допустити зниження показників церебральної оксиметрії більше, ніж 20%. Статистичну обробку отриманих результатів проводили за допомогою програмного пакету Microsoft Office Excel. Встановлено, що час проведення маніпуляцій, пов'язаних з профілактичними заходами, не залежить від виду фобій. У дітей з "легким" темпераментом становить 34'-35', зі "складним" темпераментом та темпераментом "довго розігрівається" - 30'. У дітей з "легким" темпераментом безпечний проміжок часу проведення маніпуляцій, пов'язаної з лікуванням карієсу та його ускладнень, незалежно від типу фобій становить 42'. У дітей з темпераментом "довго розігрівається" безпечний проміжок часу проведення маніпуляцій, пов'язаної з лікуванням карієсу та його ускладнень незалежно від типу фобій, становить 37'. У дітей зі "складним" темпераментом безпечний проміжок часу проведення маніпуляцій, пов'язаної з лікуванням карієсу та його ускладнень при наявності "елементарних" фобій становить 35', при наявності "криптогенних" фобій - 30'. Показаннями до проведення санації порожнини рота в умовах загального знеболення при середньому карієсі є - діти з "легким" темпераментом незалежно від типу фобій при КПВ $\geq$ 8; діти зі "складним" темпераментом та "елементарними" фобіями при КПВ $\geq$ 2; "криптогенними" фобіями при КПВ $\geq$ 1; діти з темпераментом "довго розігрівається" незалежно від типу фобій при КПВ $\geq$ 2; при глибокому карієсі - діти з "легким" темпераментом незалежно від типу фобій при КПВ $\geq$ 4; діти зі "складним" темпераментом та "елементарними" фобіями при КПВ $\geq$ 2; "криптогенними" фобіями при КПВ $\geq$ 1; діти з темпераментом "довго розігрівається" незалежно від типу фобій при КПВ $\geq$ 1; при хронічному фіброзному пульпіті - діти з "легким" темпераментом незалежно від типу фобій при КПВ $\geq$ 6; діти із "складним" темпераментом незалежно від типу фобій при КПВ $\geq$ 1; діти з темпераментом "довго розігрівається" незалежно від типу фобій при КПВ $\geq$ 2; при хронічному періодонтиті - діти з "легким" темпераментом незалежно від типу фобій при КПВ $\geq$ 6; діти зі "складним" темпераментом та "елементарними" фобіями при КПВ $\geq$ 2; "криптогенними" фобіями при КПВ $\geq$ 1; діти з темпераментом "довго розігрівається" незалежно від типу фобій при КПВ $\geq$ 1. Таким чином, лікування зубів в умовах загального знеболення у дітей віком 12-18 років передбачає більш радикальні методи лікування з обов'язковою наступною консультацією ортодонта з метою збереження жувальної, артикуляційної функцій та забезпечення повноцінного розвитку зубоцелюстного апарату.

Ключові слова: карієс, церебральна оксиметрія, діти, загальне знеболення, стоматологічні маніпуляції.

ВЫБОР УСЛОВИЙ ПРОВЕДЕНИЯ ЛЕЧЕНИЯ ЗУБОВ У ДЕТЕЙ ПОДРОСТКОВОГО ВОЗРАСТА НА ОСНОВАНИИ РЕЗУЛЬТАТОВ МОНИТОРИНГА КИСЛОРОДНОГО НАСЫЩЕНИЯ ГОЛОВНОГО МОЗГА - ЦЕРЕБРАЛЬНОЙ ОКСИМЕТРИИ

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Для решения проблемы выбора метода санации полости рта необходимо определить безопасный промежуток времени выполнения стоматологических манипуляций различной степени тяжести и количество посещений. Это даст возможность сформулировать четкие показания к проведению санации полости рта в условиях общего обезболивания с целью минимизирования риска возникновения когнитивных дисфункций на фоне гипоксического поражения головного мозга. Цель исследования: установить безопасный промежуток времени проведения различных стоматологических манипуляций у детей школьного возраста на амбулаторном стоматологическом приеме на основании объективного метода оценки кислородного насыщения головного мозга - церебральной оксиметрии; определить показания для проведения санации полости рта под общим обезболиванием. Стоматологическое обследование и проведение стоматологических манипуляций разной степени тяжести проведено 102 детям в возрасте 12-18 лет (пролечено 424 зуба) на базе Стоматологического медицинского центра при Национальном медицинском университете имени А.А. Богомольца. С целью определения насыщения кислородом головного мозга применяли метод церебральной оксиметрии. Для прогнозирования когнитивных изменений на фоне органических нарушений головного мозга мы воспользовались результатами J. Meixensberger с соавторами (1998), где главным заданием стоматолога считали не допустить снижения показателей церебральной оксиметрии больше, чем 20%. Статистическую обработку полученных результатов проводили с помощью программного пакета Microsoft Office Excel. Установлено, что время проведения манипуляций, которые связаны с профилактическими мероприятиями, не зависит от вида фобий. У детей с "легким" темпераментом составляет 34'-35', со "сложным" темпераментом и темпераментом "долго разогревается" - 30'. У детей с "легким" темпераментом безопасный промежуток времени проведения манипуляций, которые связаны с лечением кариеса и его осложнений, независимо от типа фобий составляет 42'. У детей с темпераментом "долго разогревается" безопасный промежуток времени проведения манипуляций, которые связаны с лечением кариеса и его осложнений, независимо от типа фобий составляет 37'. У детей со "сложным" темпераментом безопасный промежуток времени проведения манипуляций, которые связаны с лечением кариеса и его осложнений, при наличии "элементарных" фобий составляет 35', при наличии "криптогенных" фобий - 30'. Показаниями к проведению санации полости рта в условиях общего обезболивания при среднем кариесе есть - дети с "легким" темпераментом независимо от типа фобий при КПУ $\geq$ 8; дети со "сложным" темпераментом и "элементарными" фобиями при КПУ $\geq$ 2; "криптогенными" фобиями при КПУ $\geq$ 1; дети с темпераментом "долго разогревается" независимо от типа фобий при КПУ $\geq$ 2; при глубоком кариесе - дети с "легким" темпераментом независимо от типа фобий при КПУ $\geq$ 4; дети со "сложным" темпераментом и "элементарными" фобиями при КПУ $\geq$ 2; "криптогенными" фобиями при КПУ $\geq$ 1; дети с темпераментом "долго разогревается"

независимо от типа фобий при КПУ $\geq$ 1; при хроническом фиброзном пульпите - дети с "легким" темпераментом независимо от типа фобий при КПУ $\geq$ 6; дети со "сложным" темпераментом независимо от типа фобий при КПУ $\geq$ 1; дети с темпераментом "долго разогревается" независимо от типа фобий при КПУ $\geq$ 2; при хроническом периодонтите - дети с "легким" темпераментом независимо от типа фобий при КПУ $\geq$ 6; дети со "сложным" темпераментом и "элементарными" фобиями при КПУ $\geq$ 2; "криптогенными" фобиями при КПУ $\geq$ 1; дети с темпераментом "долго разогревается" независимо от типа фобий при КПУ $\geq$ 1. Таким образом, лечение зубов в условиях общего обезболивания у детей 12-18 лет предусматривает более радикальные методы лечения с обязательной последующей консультацией ортодонта с целью сохранения жевательной, артикуляционной функций и обеспечения полноценного развития зубочелюстного аппарата.

Ключевые слова: кариес, церебральная оксиметрия, дети, общее обезболивание, стоматологические манипуляции.