

губы и неба в регионе с экотоксикантами // Проблемы стоматологии. 2019. Т. 15. № 2. С. 89-96.

17. Чуйкин С.В., Викторов С.В., Чуйкин О.С. Применение генетических маркеров в прогнозировании стоматологических заболеваний. Монография. -LambertSaarbruchen, 2013.-361с.

18. Чуйкин С.В., Топольницкий О.З., Персин Л.С. Врожденная расщелина верхней губы и неба. Монография.-LambertSaarbruchen, 2012.-593с.

19. Состояние слизистой оболочки полости рта при заболеваниях внутренних органов/Чуйкин С.В., Макушева Н.В., Акатьева Г.Г., Акмалова Г.М., Афлаханова Г.Р., Егорова Е.Г., Снеткова Т.В., Чуйкин О.С., Чуйкин О.С. и др.; под ред. Чуйкин С.В. 1-е изд. Уфа: ООО "Печатный дом", 2016.

## DENTAL MORBIDITY AND BIOCHEMICAL INDICATORS OF ORAL FLUID IN CHILDREN SUFFERING WITH CEREBRAL PARALYSIS

*Morozova Natalia Sergeevna  
Kashtanova Maria Sergeevna*

*Moscow State Medical University named after I.M. Sechenov*

**Annotation.** Parents and medical specialists face the fact that for every 1000 children born, there are from 1 to 2–3 cases of giving birth to a child with cerebral palsy syndrome. Congenital malformations of the central nervous system are characterized by the multiplicity and combination of functional disorders. The maxillofacial region does not remain isolated from secondary changes in the morphological structure of bones, and damage to organs and tissues of the oral cavity becomes an integral part of cerebral palsy syndromes. As a result of damage to the musculoskeletal system, speech, and mental sphere, children cannot independently carry out rational oral care, therefore, they need constant care, and they certainly need help in taking measures to improve their oral cavity [1-4].

**Key words:** cerebral palsy, dental morbidity, biochemical parameters.

Relevance. Cerebral palsy is one of the most common diseases worldwide, leading to childhood disabilities due to impaired motor development. It occurs due to brain damage during the period of intrauterine development, childbirth and newborn, manifested by motor disorders (paresis, paralysis, hyperkinesia, impaired coordination). Given the development of not only the motor, but also the intellectual, psycho-speech and emotional spheres, the following forms of this disease are distinguished: double hemiplegia, spastic diplegia, hemiparetic form, hyperkinetic form, atonic-astatic form [5-13]. The Ural zone, which includes the Republic of Bashkortostan, is considered the most unfavorable in terms of child disability. The reason for the high prevalence of childhood disability is the high concentration of industrial enterprises in this territory. In cerebral palsy, cerebral structures responsible for voluntary movements are particularly affected. A motor defect is disabling not only because of the insufficiency or absence of certain skills, but also because it is a constant traumatic factor [14-17]. In addition, most children with cerebral palsy suffer from mental and speech changes. Thus, with cerebral pathology, the most important functions for a person suffer: movement, speech, psyche. Congenital malformations of the central nervous system are characterized by the multiplicity and combination of functional disorders. The maxillofacial region does not remain isolated from secondary changes in the morphological structure of the bones, and damage to organs and tissues of the oral cavity becomes an integral part of cerebral palsy syndromes. As a result of damage to the musculoskeletal system, speech, and mental sphere, children cannot independently carry out rational oral care and need constant care. Since children are easily

vulnerable to a disease such as cerebral palsy [18-19], dental measures should be carried out taking into account the specifics of neuromuscular pathology [1]. Prevention and treatment of dental diseases of such children should be of high quality and effective [3].

The aim of our study is to assess the state of the oral cavity in children with cerebral palsy, studying the kinematic viscosity and biochemical parameters of the saliva of children.

Materials and research methods. We conducted a clinical examination of children aged 12-15 years with a diagnosis of cerebral palsy of various forms (1 group - 40 people) and healthy children without neurological pathology (2 control group - 20 people). Children with cerebral pathology were examined on the basis of the State Educational Institution "Ufa Special Boarding School No. 13". External examination, examination of the oral cavity, assessment of oral hygiene was carried out visually and using a standard dental tool kit. To study the hygienic status, we applied the methods of Fedorov - Volodkina, Schiller - Pisarev tests, PMA and Green - Vermilion index. The quality of oral hygiene in patients was evaluated before conducting hygiene lessons, at the end and after a month of controlled brushing. The oral fluid was collected in the morning on an empty stomach, and the oral fluid was collected in 4.0 ml glass tubes. To determine the kinematic viscosity of saliva, a VPZh-4 capillary viscometer was used. Colorimetric determination of protein in saliva was carried out using the BELOK-PGK-NOVO reagent kit. When the protein interacts with pyrogallol red and sodium molybdate, a colored complex forms, the color intensity of which is proportional to the protein concentration in the sample. The photometric determination of calcium in saliva was determined using a set of reagents CALCIUM-NOVO. In an acidic

environment, calcium ions interact with the Arsenazo 111 indicator reagent to form a raspberry complex, the color intensity of which is directly proportional to the calcium content in the sample. The photometric determination of magnesium in saliva was determined using the MAGNIUM-NOVO reagent kit. In an alkaline medium, magnesium ions interact with the xylydyl blue indicator reagent to form a colored complex, the color intensity of which is directly proportional to the magnesium content in the sample. The photometric determination of phosphorus in saliva was determined using a set of reagents FOSFOR-NOVO. Inorganic phosphorus in the reaction with ammonium molybdenum acid in an acidic medium in the presence of a detergent forms a colorless phosphor-molybdenum complex. The optical density of the complex formed is directly proportional to the concentration of phosphorus in the sample. The level of TBA-active products in saliva was determined using a set of reagents TBA-AGAT. Lipid peroxidation products form a colored complex with thiobarbituric acid (TBA), extracted with butanol. In the observed groups, an analysis was made of changes in the level of protein, TBA-active products, trace elements (calcium, magnesium, phosphorus), and the kinematic viscosity of saliva. The calculations were carried out according to the corresponding formulas.

The results of the study and their discussion. In most children and adolescents with cerebral pathology revealed violations of the maxillofacial region [5]. Speech and breathing impairment was recorded by us in 80.4% of children with all forms of cerebral palsy. Mouth breathing prevailed in children with hemiparesis, mixed breathing prevailed in children with hyperkinesia and diplegia. Dysfunction of swallowing and chewing was detected in all examined children. 86.3% of children had weakness of the circular muscle of the mouth. With cerebral palsy, it can be difficult for children to keep their lips closed and regularly swallow saliva, so salivation in children is plentiful. Of bad habits, biting of the lips, cheeks, laying of the tongue between the teeth, and also finger sucking were most often encountered. Anomalies in the structure of the frenulum of the lips and tongue were found in 47.4%. All types of tooth and dentition anomalies were revealed, in children with spastic diplegia - 85.5%, atonic-astatic form of the disease - 88.5%, hemiplegic form - 60.2%. Among malocclusion abnormalities, the prognathic ratio of the jaws in combination with a deep bite was most often observed, and less often, open and cross types of bite. Carious lesions of the hard tissues of the teeth were most often found on the proximal surfaces of the upper and lower milk molars (in 57.14% of cases in children of the 1st group and 16.2% in children of the 2nd group), as well as cervical caries of the upper incisors (in 60% of cases - 1 group, 12.5% - 2 group). Carious cavities in children with cerebral palsy were extensive (in 29.6% of cases), pigmented dentin was easily removed by an excavator. Among non-carious lesions of hard tooth tissues, enamel hypoplasia (32.05%) was most often observed in children with central nervous system pathology; in healthy children, it was less common (4.2%). Mostly

milk teeth were affected, the reason for which was the poor hygiene of the oral cavity due to imperfection of manual skills. In 26.92% of cases in children with cerebral palsy, pathological abrasion of hard tissues of teeth was observed, an intensive decrease in hard tissues in all teeth was observed in 3.97% of children with hyperkinetic form of cerebral palsy. In children of the control group, this type of pathology did not occur. Periodontal diseases were also noted, the most common of which was chronic catarrhal gingivitis - 94.4% in children with cerebral palsy, 16% in healthy children. During the survey among children with cerebral pathology, it turned out that 80% of children with cerebral palsy do not know how to brush their teeth correctly. The indices of the studied indices before classes exceeded the norm by 2.5 times, after classes by 2.0 times, after 1 month by 1.5 times. In children of the control group, indicators before classes were 0.5%, after 0.3%, after 1 month 0.15%. Oral conditions evaluated using hygiene indices were unsatisfactory. This difference in indicators is directly related to the fact that most children with cerebral palsy do not follow oral hygiene due to constant hand hyperkinesia and intellectual deficiency. After examining the oral fluid, it was determined that in children with central nervous system disease, the average calcium in children with cerebral pathology in the oral fluid is 1.92 mmol / l, and in children without central nervous system pathology, 1.22 mmol / l. The average level of phosphorus in the oral fluid in the 1st study group is 5.18 mmol / L, in the 2nd group - 4.8 mmol / L. The average oral fluid magnesium in children with central nervous system disease is 1.43 mmol / L, and in healthy children 0.34 mmol / L. The average oral protein protein of the test group is 1.16 g / l, the control group is 1.08 g / l. The level of TBA-active products in the oral fluid of the first group was 0.420  $\mu$ mol / L, of the second group - 0.164  $\mu$ mol / L. The kinematic viscosity of saliva in children with cerebral palsy is 1.300 mm<sup>2</sup> / sec, in healthy children - 0.901 mm<sup>2</sup> / sec.

Findings. Based on the data obtained, one can judge about the high prevalence of dental diseases among children suffering from cerebral palsy, about a change in the biochemical parameters of oral fluid and kinematic viscosity upward. Our data will be used to justify the choice of means and methods for the prevention and treatment of dental diseases in children with cerebral palsy.

#### Bibliography:

1. Chuykin S.V., Akmalova G.M. Features of hematosalivary barrier in lichen planus of the oral mucosa // В сборнике: The Second European Conference on Biology and Medical Sciences Proceedings of the Conference. Mazilescu V. (Ed.). 2014. С. 48-50.
2. Chuykin S.V., Akmalova G.M., Chuykin O.S., Makusheva N.V., Aphlakhanova G.R. The concept of blood-tissue barriers in dentistry // Journal of Pharmaceutical Sciences and Research. 2017. №Т. 9. № 4. С. 415-419.
3. Чуйкин С.В., Штанько М.И. Влияние возрастных изменений критериев

стоматологического здоровья на качество жизни пациентов пожилого и старческого возраста. Институт стоматологии. 2013. № 2 (59). С. 18-19.

4. Чуйкин С.В., Аверьянов С.В. Оказание ортодонтической помощи детям Республики Башкортостан Ортодонтия 2004. № 2. С. 46-48.

5. The role of mineral elements in the pathogenesis of lichen planus of the oral mucosa /Chuykin S.V., Akmalova G.M., Chuykin O.S., Makusheva N.V., Akatyeva G.G.//Research Journal of Pharmaceutical, Biological and Chemical Sciences. 2016. Т. 7. № 6. С. 704-710.

6. Чуйкин С.В., Акмалова Г.М., Чернышева Н.Д. Особенности клинического течения красного плоского лишая с локализацией на слизистой оболочке полости рта//Клиническая дерматология и венерология. 2015. Т. 14. № 3. С. 72-75.

7. Чуйкин С.В., Малышева Г.В., Воложин А.И. Гематосаливарный барьер при стрессиндуцированных изменениях в пародонте под влиянием ритмических гипотермических воздействий//Уральский медицинский журнал, 2008. -№10. (50). -С. 30-33.

8. Чуйкин С.В., Акмалова Г.М., Штанько М.И. Состояние селективной проницаемости гематосаливарного барьера у лиц различных возрастных групп //Уральский медицинский журнал. 2014. № 5 (119). С. 82-84.

9. Чуйкин С.В., Камиллов Ф.Х., Галеева Р.Р. Изучение физико-химических показателей ротовой жидкости у детей с детским церебральным параличом. Стоматология детского возраста и профилактика. 2014. Т. 13. № 2 (49). С. 12-14.

10. Чуйкин С.В., Плечев В.В., Макушева Н.В., Бузаев И.В. Значение стоматологического обследования в диагностике атеросклеротических стенозов сонных артерий// Медицинский вестник Башкортостана. 2010. Т. 5. № 6. С. 51-54.

11. Чуйкин С.В., Давлетшин Н.А., Викторова Т.В., Шайхутдинова Д.И. Этиология, патогенез, клиника и профилактика врожденной расщелины верхней губы и неба. Уфа, 2007.

12. Галеева Р.Р., Чуйкин С.В. Клинические результаты стоматологического обследования

детей с детским церебральным параличом //Уральский медицинский журнал, 2014. - № 3 (117). - С. 36-38.

13. Чуйкин С.В., Штанько М.И. Некоторые физико-химические и биохимические показатели ротовой жидкости у лиц пожилого и старческого возраста//Институт стоматологии. 2013. № 2 (59). С. 72-73.

14. Акатьева Г.Г., Чуйкин С.В., Снеткова Т.В., Гаянова А.З., Байбурина Э.К. Оценка гигиенических знаний школьников по уходу за полостью рта // в сборнике: «Материалы одиннадцатого сибирского конгресса " Стоматология и челюстно - лицевая хирургия» с международным участием Всероссийского симпозиума" Новые технологии в стоматологии " 2016. С. 10-12.

15. Чуйкин С.В., Джумартов Н.Н., Чуйкин О.С., Кучук К.Н., Гринь Э.А., Чуйкин Г.Л., Муратов А.М., Гильманов М.В. Клинико-анатомические формы врожденной расщелины губы и неба в регионе с экотоксикантами. // Проблемы стоматологии. 2019. Т. 15. № 3. С. 127-132.

16. Чуйкин С.В., Давлетшин Н.А., Чуйкин О.С., Кучук К.Н., Джумартов Н.Н., Гринь Э.А., Гильманов М.В., Муратов А.М. Алгоритм реабилитации детей с врожденной расщелиной губы и неба в регионе с экотоксикантами // Проблемы стоматологии. 2019. Т. 15. № 2. С. 89-96.

17. Чуйкин С.В., Викторова Т.В., Чуйкин О.С. Применение генетических маркеров в прогнозировании стоматологических заболеваний. Монография. -LambertSaarbruchen, 2013.-361с.

18. Чуйкин С.В., Топольницкий О.З., Персин Л.С. Врожденная расщелина верхней губы и неба. Монография.-LambertSaarbruchen, 2012.-593с.

19. Состояние слизистой оболочки полости рта при заболеваниях внутренних органов/Чуйкин С.В., Макушева Н.В., Акатьева Г.Г., Акмалова Г.М., Афлаханова Г.Р., Егорова Е.Г., Снеткова Т.В., Чуйкин О.С., Чуйкин О.С. и др.; под ред. Чуйкин С.В. 1-е изд. Уфа: ООО "Печатный дом", 2016.