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**ТИББИЁТДА ЯНГИ КУН
НОВЫЙ ДЕНЬ В МЕДИЦИНЕ
NEW DAY IN MEDICINE**

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www.bsmi.uz

https://newdaymedicine.com E:

ndmuz@mail.ru

Тел: +99890 8061882

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THE ROLE OF HYPOXIC PERINATAL LESIONS OF THE CENTRAL NERVOUS SYSTEM AND PREMATURE BIRTH IN THE FORMATION OF BRONCHIAL ASTHMA IN CHILDREN

Khaidarova Sarvinoz Haydarjonovna <https://orcid.org/0000-0002-2840-6016>

Mavlyanova Zilola Farkhadovna <https://orcid.org/00165-2134-7222-1978>

Sharipov Rustam Khaitovich <https://orcid.org/000000025594838X>

Samarkand State Medical University, 140100 Uzbekistan, Samarkand, A. Temura street 18 Phone number: (866)233-08-41 E-mail: sammu@sammu.uz

✓ Resume

Bronchial asthma, which remains one of the pressing problems of pediatrics, is widespread and tends to steadily increase in incidence in children, shifting the onset to an earlier age. It was revealed that the majority of children with bronchial asthma have a history of perinatal damage to the central nervous system. Perinatal damage to the central nervous system increases the risk of bronchial asthma in preschool children by 3.4 times. However, it should be noted that the mechanisms of influence of perinatal damage to the central nervous system on the formation of bronchial asthma are numerous and have not yet been sufficiently studied. All of the above determines the need for further development of new diagnostic and prognostic criteria for the implementation and course of bronchial asthma in children with consequences of perinatal hypoxic damage to the central nervous system.

Key words: bronchial asthma, premature babies, central nervous system, perinatal damage.

РОЛЬ ГИПОКСИЧЕСКИХ ПЕРИНАТАЛЬНЫХ ПОРАЖЕНИЙ ЦЕНТРАЛЬНОЙ НЕРВНОЙ СИСТЕМЫ И ПРЕЖДЕВРЕМЕННЫХ РОДОВ В ФОРМИРОВАНИИ БРОНХИАЛЬНОЙ АСТМЫ У ДЕТЕЙ

Хайдарова Сарвиноз Хайдарджоновна <https://orcid.org/0000-0002-2840-6016>

Мавлянова Зилола Фархадовна <https://orcid.org/00165-2134-7222-1978>

Шарипов Рустам Хаитович <https://orcid.org/000000025594838X>

Самаркандский государственный медицинский университет, 140100 Узбекистан, г. Самарканд, ул. А. Темура, 18 Телефон: (866)233-08-41 E-mail: sammu@sammu.uz

✓ Резюме

Бронхиальная астма, остающаяся одной из актуальных проблем педиатрии, имеет широкую распространенность и тенденцию к неуклонному росту заболеваемости у детей, смещению дебюта на более ранний возраст. Выявлено, что у большинства детей, больных бронхиальной астмой, в анамнезе имеются указания на перинатальные повреждения центральной нервной системы. Перинатальное поражение центральной нервной системы в 3,4 раза увеличивает риск формирования бронхиальной астмы у детей в дошкольном возрасте. Однако следует отметить, механизмы влияния перинатального поражения центральной нервной системы на формирование бронхиальной астмы многочисленны, и изучены еще недостаточно. Все вышеизложенное обуславливает необходимость дальнейшей разработки новых диагностических и прогностических критериев реализации и течения бронхиальной астмы у детей с последствиями перинатального гипоксического поражения центральной нервной системы.

Ключевые слова: бронхиальная астма, недоношенные дети, центральная нервная система, перинатальное поражение.

BOLALARDA ASTMA SHAKLLANISHIDA MARKAZIY NERV TIZIMINING PERINATAL GIPOSIK ZARARLANISHI VA ERTA TUG'ILISHNING O'RNI

Khaidarova Sarvinoz Haydarjonovna <https://orcid.org/0000-0002-2840-6016>

Mavlyanova Zilola Farkhadovna <https://orcid.org/00165-2134-7222-1978>

Sharipov Rustam Khaitovich <https://orcid.org/000000025594838X>

Samarqand davlat tibbiyot universiteti O'zbekiston, Samarqand, st. Amir Temur, Tel: +99818 66 2330841 E-mail: sammi@sammi.uz

✓ **Rezyume**

Pediatriyaning dolzarb muammolaridan biri bo'lib qolayotgan bronxial astma keng tarqalgan bo'lib, bolalarda kasallanishning barqaror o'sishiga moyil bo'lib, boshlanishini erta yoshda kuzatilmoqda. Bronxial astma bilan og'rigan bolalarning aksariyatida markaziy asab tizimining perinatal shikastlanishi borligi aniqlandi. Markaziy asab tizimining perinatal shikastlanishi maktabgacha yoshdagi bolalarda bronxial asthma xavfini 3,4 marta oshiradi. Ammo shuni ta'kidlash kerakki, markaziy asab tizimining perinatal shikastlanishining bronxial astma shakllanishiga ta'sir qilish mexanizmlari juda ko'p va hali yetarli darajada o'rganilmagan. Yuqorida aytilganlarning barchasi markaziy asab tizimining perinatal gipoksiy shikastlanishi oqibatlari bo'lgan bolalarda bronxial astmani aniqlash va kechishi uchun yangi diagnostic va prognostik mezonlarni yanada rivojlantirish zarurligini belgilaydi.

Kalit so'zlar: bronxial astma, erta tug'ilgan chaqaloqlar, markaziy asab tizimi, perinatal shikastlanish.

Relevance

Bronchial asthma (BA) is a chronic multifactorial disease with high prevalence, especially among the pediatric population (Global Strategy for Asthma Management and Prevention, Revised 2019). At the same time, the mechanisms of the disease remain insufficiently studied, which leads to low effectiveness of treatment and rehabilitation measures. According to WHO experts, asthma is the most common chronic disease among children (The global asthma report, 2014). In approximately 30% of cases, asthma resolves by adolescence and adulthood [3,8,12]. So in Russia, 6.9% of the country's population suffers from asthma. Moreover, 15% of them are children under 11 years of age [15].

Modern ideas about the pathogenesis of asthma associate the development of the disease with congenital abnormalities of neuroimmune regulation, leading to inflammatory and allergic components with bronchial hyperreactivity [4,6]. The diathesis-stress model of AD considers the basis of the disease to be early damage to the hypothalamic-diencephalic structures, leading to disruption of autonomic-humoral regulation, especially manifested in the emotional and motivational aspects of behavior [9,13]. The psychoanalytic concept adds to the indicated pathogenesis personal problems characteristic of AD patients - alexithymia, reflection deficit, anticipatory failure. As a result, by adolescence and adulthood, a characteristic psychosomatic (anxious) profile of a patient with AD is formed [21,27].

According to modern literature, newborns who have suffered hypoxia-ischemia in the perinatal period in subsequent periods of childhood have neurological deficits of varying severity in the form of delayed neuropsychic and motor development, minimal brain dysfunction, disorders of social adaptation, cerebral palsy, epilepsy [22,25]. At the same time, children and adolescents with consequences of perinatal damage to the central nervous system (CNS) often have functional changes in various organs and systems [1,2,13]. Diseases of the hepatobiliary system, gastrointestinal tract, cardiovascular, and immune systems are noted as concomitant conditions.

Recently, special attention has been paid to the pathology of the bronchopulmonary system, including such a severe chronic disease as bronchial asthma in conjunction with perinatal damage, which contributes to the frequent development of bronchial obstruction in children of the first years of life [16,18,33,35]. However, in order to fully reveal the pathogenetic mechanisms of the formation of asthma in children, a comprehensive examination using modern diagnostic methods is necessary.

Over the past 10 years, the frequency of births of very premature and low birth weight babies, including twins, has increased by 14%. In multiple pregnancies, both the frequency of premature births and the risk of developing respiratory distress syndrome (RDS), complications and death increases [29,34].

The influence of perinatal neuropathology on the state of the respiratory system in children, which requires a complex of rehabilitation measures at different age periods, is beyond doubt, but the mechanisms of the formation of bronchopulmonary pathology still remain poorly understood. Domestic and foreign literature describes various forms of bronchial asthma (physical effort, aspirin, bronchial asthma in the elderly), but there is relatively little data on the characteristics of the course of this disease in premature infants. With the development of the material and technical base in medicine, it has become possible to care for children born with extremely low body weight. Such children, like premature babies in general, often require long-term artificial pulmonary ventilation (APV), which cannot go unnoticed by the bronchopulmonary system in the future. In premature babies, whose lungs are not fully formed, the likelihood of bronchopulmonary dysplasia is high, ventilation is impaired, surfactant is restored slowly, the immune system is not mature - all this contributes to the relative ease of developing asthma [7,20].

I.Yu. Yurova, based on the research conducted, concludes that long-term mechanical ventilation in strict modes in premature infants (oxygen concentration above 60% with a positive inspiratory pressure of 10-30 mm water column) promotes earlier formation (4.6 ± 0.75 years) and more severe asthma. The type of feeding and the severity of perinatal damage to the central nervous system also influence the formation and course of BA in follow-up in children with a gestational age of less than 37 weeks at birth.

Despite the high reparative capabilities of the human body in early postnatal ontogenesis, many pathological processes in newborns leave a deep mark and manifest themselves in later life, leading to growth disproportions and persistent residual effects on the nervous system and internal organs [11,24].

In this regard, the study of the state of the respiratory system in children born gestationally immature and the characteristics of the course of bronchopulmonary diseases in such patients are an urgent problem of modern pediatrics.

Recently, an opinion has increasingly been expressed about the serious contribution of hypoxic damage to the central nervous system and prematurity in the genesis of the disease. The consequences of perinatal central nervous system damage is the functional instability of cortical-subcortical interactions that regulate the respiratory complex. Prematurity leads to morphofunctional immaturity of brain structures that provide autonomous regulation of vital functions. Hypoxia and prematurity are factors in the imperfection of the newborn's immune response, leading to frequent infectious diseases that disrupt the neurogenic regulation of the bronchi [26,32]. Some studies have noted a correlation between the depth of CNS damage and the severity of AD symptoms caused by more severe neuro-immune-endocrine imbalance [19,30].

In severe perinatal hypoxia, the bronchopulmonary system itself is affected quite often: circulatory disorders lead to the development of adult-type respiratory distress syndrome and secondary surfactant deficiency. Children who have suffered respiratory pathology in the neonatal period subsequently suffer from pneumonia, bronchitis, and acute respiratory diseases 2-3 times more often, and the highest incidence was noted in children who underwent resuscitation measures [26,28].

I.Yu. Yurova (2012) found that a significant role in the occurrence of asthma is played by perinatal damage to the child's central nervous system in the form of cerebral ischemia, liquorodynamic and hemodynamic disorders, which creates conditions for the occurrence of various diseases in children at an older age. It was revealed that birth trauma ($p=0.0012$) and asphyxia ($p=0.008$) were more often detected in the history of children born prematurely. In the neonatal period, these children, compared with children born at term, significantly more often had a clinical picture of more severe damage to the central nervous system in the form of intraventricular hemorrhages, and children with a gestation period of less than 35 weeks with M-Echo study had a picture of intraventricular hemorrhage (IVH) of the II degree. However, among children born prematurely who received neurological treatment in the 1st year of life, mild and moderate asthma was recorded significantly more often ($p=0.0026$) than in children who did not receive such treatment.

Neurological and psychopathological disorders that develop as a result of the consequences of perinatal central nervous system damage naturally close the vicious circles of AD pathogenesis, limiting the patient's adaptive capabilities throughout life. In this regard, the study of clinical and dynamic features of psychoneurological disorders in children with AD is a very urgent task, as it can help improve methods of prevention and treatment of this disease [10,31].

Currently, the attention of researchers is focused on the mechanisms of early development of asthma, the search for factors that determine the persistence of clinical symptoms and the severity of the disease, which could determine ways of prevention [5,14]. Various adverse effects in the ante- and postnatal period

can contribute to the sensitization of the child's body, change the functional activity of the neuro-immuno-endocrine system, which, in the presence of a genetic predisposition to atopy and even in its absence, can influence the development of allergic inflammation and bronchial hyperreactivity [17,23].

Perinatal damage to the central nervous system increases the risk of developing bronchial asthma in children of preschool age by 3.4 times. The formation of bronchial asthma in preschool children, along with hereditary and constitutional predisposition to atopy, is significantly influenced by disturbances in the mechanisms of neuro-vegetative regulation of the cardiorespiratory system, resulting from adverse nonspecific influences in perinatal ontogenesis [17,21,27]. This is of particular importance in view of the steady growth of neurological pathology of the perinatal period. The most pressing issue in perinatal neurology is hypoxic damage to the brain of the fetus and newborn, caused by chronic intrauterine fetal hypoxia and acute asphyxia during childbirth [30,35]. The results of modern studies have proven the relationship between clinical syndromes of central nervous system damage during the neonatal period and their consequences [27,33].

Predisposition to allergic diseases in children who have suffered adverse effects in the prenatal period, according to Holt. P., may be associated with the hyperactivity of the control mechanisms that intrauterine protect the fetoplacental complex from the toxic effects of Th-1 cytokines characteristic of complicated pregnancy, and, as a consequence, with a shift in the intrauterine environment towards the Th-2 phenotype (Holt P. G., 2007).

The occurrence of atopic conditions in children is significantly associated with the presence of various pregnancy complications in pregnant women, primarily toxicosis and gestosis, which are the main etiological factors of chronic intrauterine fetal hypoxia. A number of studies have shown that already in the first months of life, the majority of children whose mothers suffered severe gestosis, allergic reactions are observed [3,5].

It has been established that intrauterine sensitization of the fetus, which can occur during gestosis of pregnancy, acute viral or bacterial infections, exacerbation of chronic inflammatory diseases in the mother, contributes to the early onset of asthma in children [2,6,33]. It has been proven that sensitization of a child can occur in utero through the entry of allergens in the mother's IgG, which carry food allergens, through the fetal skin, respiratory tract and through the entry of amniotic fluid into the fetal gastrointestinal tract during swallowing movements, as well as the ability of the fetus to synthesize its own IgE already in early pregnancy. Chronic intrauterine fetal hypoxia can enhance the entry of allergens into the fetal body, as well as switch the TH1 to TH2 immune response through increased synthesis of the corresponding cytokines [12,14,29,31].

In addition, it is known that intrauterine hypoxia can influence the formation and course of asthma by increasing the hyperreactivity of the bronchial tree through disruption of the mechanisms of regulation of muscle tone and bronchial innervation. This happens because in children who have suffered chronic hypoxia in utero or acute asphyxia intrapartum, there are profound disturbances in the activity of the neuroendocrine system caused by dysfunction of the centers of the hypothalamic level. The vulnerability of neuroendocrine centers is explained by topographical features and strong sensitivity to hypoxia of the hypothalamus and brain stem. Experimental data indicate that an imbalance in the neuroendocrine system in the neonatal period leaves long-term consequences in the form of defects in anti-stress defense and a tendency to the formation of autonomic disorders. The resulting autonomic changes are the cause of dysregulation of muscle tone and bronchial innervation [29,34,35].

T.S. Petrenko, when studying the clinical and pathogenetic patterns of development of mental disorders in children with asthma, established that mental disorders in them belong to the psychoorganic circle with phenomena of mental dysontogenesis and secondary borderline mental disorders. The manifestation of asthma corresponds to the activation of the processes of compensation and decompensation in the central nervous system, arising in response to exogenous-organic pathogenic factors of the antenatal and perinatal periods. The predominant localization of pathological processes in the central nervous system is limbic structures, diencephalic parts of the brain, and interhemispheric tracts. The search for common pathogenetic mechanisms for the development of psychoneurological, somatovegetative and neuro-immune-endocrine disorders in AD is a promising task, the solution of which will make it possible to develop a set of effective measures for primary prevention and treatment of AD and related disorders [27,31].

Perinatal hypoxic lesions of the central nervous system lead to functional instability of the cortical-subcortical and spinal structures of the brain that regulate the respiratory complex. In addition, respiratory and cardiovascular disorders characteristic of the perinatal period, disorders of cerebral status, hemorrhagic and hematological disorders in the fetus and newborn, prematurity, morphofunctional immaturity,

intrauterine growth retardation and infectious diseases specific to the perinatal period disrupt the neurogenic regulation of smooth tissue tone bronchial muscles and damage the ciliated epithelium. The consequence of this is increased permeability of the mucous membrane to allergens, which triggers sensitization mechanisms, leads to an increase in specific and nonspecific bronchial hyperreactivity and ultimately causes the development of BA [34,35].

Due to the specifics of the brain organization, as a consequence of perinatal damage to the central nervous system, a child with asthma is always ready to respond with anxiety to any stressful situation. A vicious circle is formed: the consequences of perinatal damage to the central nervous system through increased activity of the hypothalamic-diencephalic structures and the cerebral cortex maintain a high level of anxiety, and respiratory disorders in asthma cause hemodynamic and metabolic dysregulation of the brain's energy supply systems. This, in turn, affects the child's behavior, causing the formation of alexithymia and the progression of AD [25,27].

V.V. Marinich, I.N. Eliseeva found that perinatal damage to the central nervous system in children with asthma causes the development of functional disorders of the subcortical parts of the brain, functional failure of the diencephalic parts of the brain, disrupts interhemispheric interactions, participates in the formation of alexithymia, contributes to emotional and personal disorders with an increased level of anxiety, which is also a predictor of persistent course BA [5,15].

Conclusion

Thus, it should be noted that the mechanisms of influence of perinatal CNS damage on the formation of bronchial asthma are numerous and have not yet been sufficiently studied. This primarily proves the need for preventive measures for the physiological course of pregnancy in women. Since chronic hypoxia, acute asphyxia during childbirth and, especially, the resulting premature birth contribute to the development of not only neurological pathology, but also multiple organ disorders. Moreover, in children who have suffered perinatal damage to the nervous system, somatic pathology, including bronchial asthma, is much more severe.

LIST OF REFERENCES:

1. Balabolkin I. I. Bronchial asthma in children of the first years of life / I. I. Balabolkin // Russian Pediatric Journal. - 2013. - No. 1. - P.24-28.
2. Vasilyeva I. A. The influence of unfavorable ante- and postnatal factors on the formation and course of bronchial asthma in preschool children: abstract. dis. ...cand. honey. Sciences: 14.00.09 / Vasilyeva Irina Aleksandrovna. - Smolensk, 2003. – 23 p.
3. Zabolotskikh T.V. A system for active detection of chronic bronchopulmonary pathology in children and treatment and rehabilitation measures taking into account socio-medical and psychological factors: abstract. dis. Dr. med. n auk. Voronezh, 2004. 48 p.
4. Zainiddinova R.S. Perinatal hypoxic brain lesions in children / R. S. Zainiddinova, I. E. Smirnov, V. A. Ivanov // Russian Pediatric Journal. – 2011. - No. 2. - P. 23-29.
5. Israelyan Yu.A. Features of the formation and clinical course of broncho-obstructive syndrome in young children with perinatal damage to the nervous system: dis. Ph.D. honey science: 14.00.09 / Yu.A. Israelyan. – Nizhny Novgorod, 2005. – 153 p.
6. Krasnorutskaya O.N., Ledneva V.S. Clinical and biochemical parameters in the diagnosis of developmental disorders in children with consequences of perinatal damage to the nervous system // Pediatrics. – 2018. - T.97. - No. 3 – pp. 175-179.
7. Kuzmina T.B. Prediction of bronchopulmonary diseases at an early age in children who were on mechanical ventilation in the neonatal period. / Author's abstract. dis. kand. honey. Sci. - M.; 1996.
8. Krivonosova G.M., Legonkova T.I., Kosenkova T.V. Features of the neuropeptide status of children with bronchial asthma and consequences of perinatal damage to the central nervous system // Modern problems of science and education. – 2015. – No. 4.
9. Mavlyanova Z. F., Hajdarova S. H. Aktual'nye voprosy hronicheskogo bronhita u detej // Science and Education. – 2023. – T. 4. – №. 2. – S. 328-337.
10. Mavlyanova Z. F., Hajdarova S. H., SHaripov R. H. Somatomorfometricheskij status detej s bronhial'noj astmoj // Science and Education. – 2023. – T. 4. – №. 4. – S. 345-352.
11. Mavlyanova Z. F., Ibragimova M. SH. Detskij cerebral'nyj paralich i faktory riska ego voznikoveniya // Science and Education. – 2023. – T. 4. – №. 2. – S. 42-47.
12. Maltseva T.A., Kolosov V.P., Pirogov A.B. The effectiveness of variability in the levels of thyroid-stimulating hormone in the blood in assessing altered bronchial reactivity in patients with bronchial asthma // Bulletin. Issue 46, 2012. – pp. 19-24.

13. Mamedyarov A.M., Namazova L.K., Kuzenkova N.Yu. Features of EEG power spectra in children with bronchial asthma during functional tests and under conditions of negative emotional activation // *Pediatric Pharmacology* / 2018 / Volume 5 / No. 5. - P.74-78.
14. Matyushchenko O.V. Ig levels A Ig M, Ig G in children with allergic bronchial asthma and atopic dermatitis // *Bulletin of VSMU*, - 2011., - Volume 10, No. 2. - P. 69-75.
15. Mizernitsky Yu.L., Pavlenko V.A., Melnikova I.M. Clinical and functional criteria for the prognosis of bronchial asthma in early childhood // *Russian Bulletin of Perinatology and Pediatrics*, 4. – 2015. - P. 82-88.
16. Mineev V.N., Lalaeva T.M., Trofimov V.I. Bronchial asthma and obesity: common mechanisms // *Clinical medicine*. No. 4. 2012. - p. 4-10.
17. Nenasheva N.M., Sebekina O.V. Achieving and maintaining control of atopic bronchial asthma using a single inhaler regimen in real clinical practice // *Practical Pulmonology* 2016, No. 2. – P. 3-8.
18. Ovsyannikov D.Yu., Eliseeva T.I., Khaled M., Alekseeva O.V., Artyukov O.P. Comorbidity of bronchial asthma in children: causal, complicated, unspecified, reverse. // *Pediatrics*. – 2021. – Volume 100, No. 2. – P. 127-137.
19. Pozdnyakova O.Yu., Baturin V.A. Impact of gastroesophageal reflux disease on the course of bronchial asthma // *Kuban Scientific Medical Bulletin* No. 3 (132) 2012. – P. 114-117.
20. Pavlenko V.A., Melnikova I.M., Mizernitsky Yu.L. Clinical and diagnostic aspects of the prognosis of bronchial asthma in young children // *Medical Council*. - No. 9. – 2017. - p. 70-75.
21. Pavlenko V.A., Melnikova I.M., Mizernitsky Yu.L. Prognostic value of functional indicators of the respiratory system and autonomic nervous system in young children who have suffered acute obstructive bronchitis against the background of perinatal damage to the central nervous system // *Issues of practical pediatrics*. – 2015. – T.10. - No. 1 – P. 7-14.
22. Petrenko T.S., Retyunsky K.Yu., Levchenko O.V., Izmodenov P.A. Psychoneurological disorders in children with bronchial asthma. *Practical medicine*. 2019. Volume 17, No. 3, pp. 104-108.
23. Troshin V.M., Beltyukov E.K., Bratukhin K.P., Khrebtov S.D. The role of leukotriene receptor antagonists in achieving control of bronchial asthma // *Medicine of extreme situations*. 2017. - p. 25-30.
24. Truntsova E. S., Sagitova G. R., Brysina N. R. Some aspects of the physical development of preschool children with bronchial asthma // *Universum: medicine and pharmacology*. 2016. - p. 42-49.
25. Kholichev D. A. Structure of perinatally caused bronchopulmonary diseases / D. A. Kholichev, O. A. Senkevich // *Current problems of pediatrics and neonatology: collection. scientific tr. interregion scientific - practical conf.* – Khabarovsk, 2014. – P. 102-103.
26. Yurova I. Yu. Features of bronchial asthma in children born prematurely: abstract. dis. ... cand. med. Sciences: 01/14/08 / Yurova Irina Yurevna. – Voronezh, 2012. – 23 p.
27. Yusupova L.V., Retyunsky K.Yu. Non-psychotic mental disorders of residual organic origin in young children who have suffered perinatal damage to the central nervous system // *Practical Medicine*. – 2013. – No. 1 (66). - WITH. 176–181.
28. Abdullaeva N. N., Kim O. A. Klinicheskie osobennosti fokal'no obuslovlennoj simptomaticheskoy visochnoj epilepsii u bol'nyh pozhilogo vozrasta // *Dobrohotovskie chteniya*. – 2017. – S. 35-37.
29. Abdusalomova M. A., Mavlyanova Z. F., Kim O. A. Orqa miya va umurtqa poronasining b'jtin qismining turruk zharoxatlari bilan bemorlarning diagnostikasida elektronejromiografiyaning y'ri // *Jurnal biomeditsiny i praktiki*. – 2022. – T. 7. – №. 2.
30. Anatolevna K. O., Akbarovna A. M., Mamasharifovich M. S. Zhalolitdinova Shaxnoza Akbarzhon kizi, Ibragimova Leyla Ilxomovna.(2022). the influence of risk factors on the development of cerebral strokes in children. open access repository, 8 (04), 179–182.
31. Burhanova G., Mavlyanova Z., Kim O. Vliyanie sportivnogo pitaniya na fizicheskoe razvitie detej i podrostkov s povyshennoj fizicheskoy nagruzkoj // *Jurnal problemy biologii i mediciny*. – 2017. – №. 4 (97). – S. 24-26.
32. Hudojkulova F. V. i dr. the structure, age features, and functions of hormones. // *Pedagog*, 1 (5), 681-688. – 2023.
33. Mavlyanova Z. F., Burxanova G. L., Hursandov M. H. General practitioner's tactics for convulsive syndrome in children // *Editor coordinator*. – 2021. – C. 468.
34. Ravshanova M. Z., Mirhakimova F. M. Sovershenstvovanie reabilitacionnyh meropriyatij pri progressiruyushchih myshechnyh distrofiyah // *Aktual'nye aspekty medicinskoj deyatel'nosti*. – 2021. – S. 319-320.
35. Khaidarzhonovna K. S., Farkhadovna M. Z., Khaitovich S. R. Features of physical development in children with bronchial asthma // *Journal of biomedicine and practice*. – 2023. – T. 8. – №. 2.

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