Stress in the Pathogenesis of Stroke

Ahmedova Fotima

Department of Neurology and Psychiatry
Fergana Medical Institute of Public Health

ABSTRACT

In our report, we analyze the data of the study on the parameters of the intensity of free radical processes and indicators of the state of the enzymatic and non-enzymatic antioxidant defense system in patients with stroke in the aspect of verification of oxidative stress in the pathogenesis of this disease.

Keywords: ischemic stroke, disease pathogenesis, oxidative stress

Introduction. Free radical oxidation is one of the most important regulators of lipid and protein metabolism, a process that underlies the plastic and energy supply of cell, organ, and organism functions as a whole. Conditions are constantly present in cellular structures for the implementation of free radical oxidation. This is due to the presence of: substrates, initiators and catalysts. At the same time, the normal content of free radical oxidation products is low due to the existence of a constantly functioning complex of endogenous mechanisms of the antioxidant defense system of non-enzymatic and enzymatic links in the body that control the level of: reactive oxygen species, free radicals and molecular products of free radical oxidation. A typical representative of the free radical process is lipid peroxidation, in which a number of primary, secondary and end products are formed during the stepwise degeneration of polyunsaturated lipids. An excess of lipid peroxidation products and an increase in the concentration of reactive oxygen species as a manifestation of oxidative stress leads to a violation of microsomal oxidation and determination of the process of translation of protein molecules and, ultimately, to a violation of the structural and functional state of cell membranes. This underlies the development of pathology. Thus, oxidative stress should be considered as one of the mechanisms of pathogenesis in a number of diseases, including the development of stroke.

Main part . 50 patients with ischemic , 50 patients with hemorrhagic and 30 donors were examined. A study of 17 indicators in the blood and two indicators in the cerebrospinal fluid of parameters of the intensity of free radical oxidation of lipids and proteins was carried out, taking into account the concentration of primary, intermediate and final oxidation products, and an assessment was made of the indicators of the state of the endogenous antioxidant defense system of its non-enzymatic and enzymatic links. The indicators of nitric oxide metabolites were also analyzed. The data obtained are analyzed in our report.

Increasing the concentration of dienes conjugates indicates intoxication of the process. malonic dialdehyde is not only reactive, but also toxic. The formation of intermolecular crosslinks as a result of the action of malon dialdehyde is realized by a

violation of lipid-protein and interprotein interactions with the formation of "ballasts" that negatively affect the functional state of cell membranes. An increase in Schiff's bases indicates a trend towards chronic activation of LPO.

Vitamin E is an endogenous antioxidant that interacts with lipid and peroxide radicals to form ballast products, and oxidizes itself. A decrease in the blood concentration of vitamin E indicates a pronounced activation of LPO processes.

Common non-protein and protein thiols are BN-groups of proteins and amino acids. They react with reactive oxygen species and oxidize themselves. A decrease in their concentration in the blood indicates a pronounced activation of lipid peroxidation, and is also an indirect sign confirming a decrease in the concentration of reduced glutathione .

The anti-radical activity of blood lipids is the total anti-radical activity of blood enzymes, a non-enzymatic link in antioxidant defense, which have the ability to neutralize hydrogen peroxide and reactive oxygen species. A decrease in this activity indicates an imbalance in the non-enzymatic and enzymatic links of the antioxidant defense system.

Reduced glutathione , an endogenous bioantioxidant , is itself oxidized by participating in reactions with hydroperoxides. Used as a substrate for the antioxidant activity of GPO. oxidized Glutathione is a substrate for GRU to work. Glutathione is involved in the transport of amino acids and maintaining the sulfhydryl groups of proteins in a reduced state. A decrease in its concentration indicates an imbalance in the enzymatic link of antioxidant protection.

Glutathione peroxidase - neutralizes hydroperoxides in the body, transferring an electron from glutathione to peroxide, while glutathione is oxidized. GPO is activated with the intensification of lipid peroxidation, its activity decreases with a decrease in the concentration of reduced glutathione , as a manifestation of imbalance and depletion of the enzymatic link of the AOD system.

Nitric oxide is a radical that is formed as a result of the oxidation of nitrogen-containing active functional groups, thereby exhibiting pro-oxidant properties that stimulate the intensification of lipid peroxidation. It recovers itself to nitrates and nitrites, violating the tone of the vascular wall.

Nitric oxide and its metabolites are an unstable free radical, which, in addition to its own toxic effect, under certain conditions, reacting with a free oxygen radical - with a superoxide oxygen radical, forms a compound that is toxic, especially for the nervous system - peroxynitrite . An increase in the concentration of nitric oxide and its metabolites is evidence of these negative phenomena of free radical oxidation.

Conclusions.

Significant activation of free-radical oxidation processes in patients with ischemic and hemorrhagic stroke was shown.

An increase in the activity of catalase and superoxide dismutase indicates an excess of hydrogen peroxide and reactive oxygen species in the blood, which once again confirms the intensification of free radical oxidation processes in ischemic and hemorrhagic stroke.

Vitamin E is an endogenous antioxidant that interacts with lipid and peroxide radicals to form ballast products, and oxidizes itself. A decrease in the blood concentration of vitamin E indicates a pronounced activation of LPO processes.

Glutathione peroxidase - neutralizes hydroperoxides in the body, transferring an electron from glutathione to peroxide, while glutathione is oxidized. GPO is activated with the intensification of lipid peroxidation, its activity decreases with a decrease in the concentration of reduced glutathione , as a manifestation of imbalance and depletion of the enzymatic link of the AOD system.

Nitric oxide and its metabolites are an unstable free radical, which, in addition to its own toxic effect, under certain conditions, reacting with a free oxygen radical - superoxide oxygen radical, forms a compound that is toxic, especially for the nervous system - peroxynitrite . An increase in the concentration

of nitric oxide and its metabolites is evidence of these negative phenomena of free radical oxidation.

Literature

1. Muzaffar, Z. (2022). HIV Encephalopathy and its Pathogenetic Aspects. *European Multidisciplinary Journal of Modern Science*, *4*, 843-846.
2. Зокиров, М. М., Рустамова, И. К., Касимова, С. А., & Кучкарова, О. Б. (2019). Жарохатдан кейинги талвасада кечки нейровизуализацион ўзгаришлар. In *Современная медицина: новые подходы и актуальные исследования* (pp. 56-60).
3. Zokirov M., Mukhammadjonov, O. (2022). Cognitive Impairments in Patients with HIV-Associated Encephalopathy. *Central asian journal of medical and natural sciences*, *3*(2), 401-405.
4. Zokirov, M. M., & Mukhammadjonov, O. (2022). Cognitive impairment in patients with Parkinson's disease and optimization of its treatment. *Eurasian Scientific Herald*, *7*, 177-180.
5. Зокиров, М., & Туланбоева, С. (2022). Когнитивные нарушений у пациентов с ВИЧ–ассоциированной энцефалопатией. *Barqarorlik va yetakchi tadqiqotlar onlayn ilmiy jurnali*, 68-73.
6. Muzaffar, Z. (2022). Literature reviews on nervous system damage during hiv infection. *Barqarorlik va yetakchi tadqiqotlar onlayn ilmiy jurnali*, *2*(9), 141-147.
7. Muzaffar, Z. (2022). Correction of cognitive disorders in patients with hiv encephalopathy. *Web of Scientist: International Scientific Research Journal*, *3*(12), 402-411.
8. Muzaffar, Z. (2022). Psychological State in Patients with HIV Infection. *Amaliy va tibbiyot fanlari ilmiy jurnali*, *1*(6), 52-56.
9. Зокиров, М., & Мадмаров, Д. (2022). Корреляция ээг картины головного мозга и когнтитивного статуса у пациентов с эпилепсией. *Theoretical aspects in the formation of pedagogical sciences*, *1*(5), 227-230.
10. Зокиров, М. (2021). Medical sciences. *scientific ideas of young scientists*, 21
11. Зокиров, М. (2022). Анализ когнитивных нарушений у пациентов с вич–энцефалопатией. *Barqarorlik va yetakchi tadqiqotlar onlayn ilmiy jurnali*, *2*(10), 251-260.
12. Muhammadjonov, O., & Zokirov, M. 2-toifa qandli diabet bilan og'rigan bemorlarda yurak-qon tomir kasalliklarining xavf omillarining tarqalishi. *Студенческий вестник Учредители: Общество с ограниченной ответственностью" Интернаука" Тематическое направление: Other social sciences*, 53-54.
13. Зокирив М. Коррекция когнитивных нарушений у больных с ВИЧ-ассоциированной энцефалопатией. *Дж. Теор. заявл. науч.* **2021** , *7* , 62–66. [**Академия Google**] [**Перекрестная ссылка**]
14. Мурадимова, А. Р., & Ахмедова, Ф. Ш. (2019). СЕСТРИНСКИЙ УХОД ЗА ПАЦИЕНТАМИ ПРИ ГЕМОРРАГИЧЕСКОМ ИНСУЛЬТЕ. In *Инновации в медицине* (pp. 188-192).
15. Мурадимова, А. Р., Усманова, Д. Д., & Садиков, У. Т. (2020, October). ПЕРЕСЕКАЮЩИЕ ПАРАЛЛЕЛИ: СОСУДИСТАЯ ДЕМЕНЦИЯ И ИШЕМИЧЕСКАЯ БОЛЕЗНЬ СЕРДЦА. In *НАУЧНО-ПРАКТИЧЕСКАЯ КОНФЕРЕНЦИЯ С МЕЖДУНАРОДНЫМ УЧАСТИЕМ «АКТУАЛЬНЫЕ ПРОБЛЕМЫ ПАТОФИЗИОЛОГИИ»* (Vol. 28, p. 85).
16. Мурадимова, А. Р. (2019). КЛИНИКО-НЕВРОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ТЕЧЕНИЯ СОСУДИСТОЙ ЭПИЛЕПСИИ, ПРОГНОЗИРОВАНИЯ И ЛЕЧЕНИЯ.

In *Инновации в медицине* (pp. 178-182).

17. Ахмедова, Ф. Ш., Ахмедова, Е. А., Мурадимова, А. Р., & Абдужаппарова, Н. Э. (2019). НАРУШЕНИЯ КОГНИТИВНЫХ ФУНКЦИЙ ПРИ ПОСТТРАВ-МАТИЧЕСКОЙ ЭНЦЕФАЛОПАТИИ. In *Инновации в медицине* (pp. 166-173).
18. Мурадимова, А. Р. (2019). КЛИНИКО-ДИАГНОСТИЧЕСКИЕ АСПЕКТЫ И СОВРЕМЕННЫЕ ПОДХОДЫ К ЛЕЧЕНИЮ СОСУДИСТОЙ ДЕМЕНЦИИ. In *Инновации в медицине* (pp. 185-188).
19. Мурадимова, А. Р., & Хайдарова, Б. А. (2019). ДИФФЕРЕНЦИАЛЬНО-ДИАГНОСТИЧЕСКИЕ КРИТЕРИИ РАЗЛИЧНЫХ ВИДОВ ГИПЕРКИНЕЗОВ. In *Инновации в медицине* (pp. 183-185).
20. Усманова, Д. Д., Мурадимова, А. Р., & Ашуралиев, И. М. (2019). НЕЙРОТРОФИЧЕСКИЕ БЕЛКИ КРОВИ И ИХ КОРРЕЛЯЦИИ С ФАКТОРАМИ СОСУДИСТОГО РИСКА У ПАЦИЕНТОВ С ДИСЦИРКУЛЯТОРНОЙ ЭНЦЕФАЛОПАТИЕЙ, ОСЛОЖНЕННОЙ СОСУДИСТОЙ ДЕМЕНЦИЕЙ. *РЕДАКЦИОННАЯ КОЛЛЕГИЯ*, 12.
21. Мурадимова, А. Р. (2019). КЛИНИКО-НЕВРОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ТЕЧЕНИЯ СО-СУДИСТОЙ ЭПИЛЕПСИИ, ПРОГНОЗИРОВАНИЯ И ЛЕЧЕНИЯ. In *Инновации в медицине. Материалы I международной научно-практической конференции-Махачкала, 2019.-Том. II.-232 с.* (p. 178).
22. RASHIDOVNA, A. M., & USMANOVA, D. D. VASCULAR DEMENTIA: NEUROIMAGING ASPECTS. *БИОМЕДИЦИНА ВА АМАЛИЁТ ЖУРНАЛИ*, 200.
23. Мурадимова, А. Р. (2019). Нейрофизиологический аспект метаболической терапии хронической церебральной ишемии. In *Инновации в медицине* (pp. 192-197).
24. Muzaffar, G. (2023). Features of Reactive Psychosis in Schizophrenia. *Research Journal of Trauma and Disability Studies*, *2*(1), 44-49.
25. Muzaffar, G. (2023). Modern Concepts About Schizophrenia. *Eurasian Medical Research Periodical*, *16*, 37-41.
26. Гуломкодиров, М., & Машрапов, Ж. (2022). ЭМПИРИЧЕСКИЙ ПОИСК ВЗАИМОСВЯЗИ КОГНИТИВНОГО ФУНКЦИОНИРОВАНИЯ И ОБЩЕКЛИНИЧЕСКОЙ КАРТИНЫ У БОЛЬНЫХ ШИЗОФРЕНИЕЙ. *Theoretical aspects in the formation of pedagogical sciences*, *1*(5), 221-223.
27. Долимова М.А., Аграновский М.Л., Солиев Д.М., Гуломкодиров М.М. (2022). РОЛЬ ПОДДЕРЖИВАЮЩЕЙ ТЕРАПИИ В СРАВНИТЕЛЬНОЙ ЭФФЕКТИВНОСТИ КАЧЕСТВА И СТРУКТУРЫ РЕМИССИЙ ПРИ РЕЦИДИВНОЙ ШИЗОФРЕНИИ. *Искусство медицины. Международный медицинский научный журнал* , *2* (1).
28. Ғуломқодиров, М. (2021). АФЪЮНГА ҚАРАМЛИК ХОСИЛ БУЛИШ ДИНАМИКАСИ ВА ХУСУСИЯТЛАРИ. *Интернаука*, (20-7), 23-25.
29. Аграновский, М. Л., Гуломкодиров, М. М., Далимова, С. А., & Муминов, Р. К. (2022). АНАЛИЗ ДАННЫХ ОТДАЛЁННОГО КАТАМНЕЗА ПРИ ШИЗОФРЕНИИ С РЕМИТТУРУЮШИМ ТИПОМ ТЕЧЕНИЯ. *Экономика и социум*, (6-2 (97)), 285-288.
30. Аграновский, М. Л., Гуломкодиров, М. М., Муминов, Р. К., & Далимова, С. А. (2022). ОТДАЛЕННЫЙ ЭТАП ШИЗОФРЕНИИ С РЕМИТТУРУЮШИМ ТИПОМ ТЕЧЕНИЯ И РАССТРОЙСТВ ШИЗОФРЕНИЧЕСКОГО СПЕКТРА. *Экономика и социум*, (6-2 (97)), 289-292.

31. Ғуломқодиров, М. (2021). ЮРАК-ҚОН ТОМИР КАСАЛЛИКЛАРДАГИ ДЕПРЕССИЯ ХОЛАТИНИ ТАШҲИСЛАШ ВА ДАВОЛАШНИ ТАКОМИЛЛАШТИРИШ. *Интернаука*, (17-4), 61-62.