AJLLSE
GLOBAL RESEARCH NETWORK

AMERICAN Journal of Language, Literacy and Learning in STEM Education
Volume 01, Issue 06, 2023 ISSN (E): 2993-2769

Essential Minerals as a Factor in the Development of Acute Myocardial Infarction (Literary Review)

Mavlonov N. H.

Resume

The article provides a literary review of scientific articles using the resources of PubMed and Scopus search engines over the past 20 years, based on the following keywords in relation to the epidemiological situation of myocardial infarction, the features of the clinical course with a lack of trace elements.

Keywords: myocardial infarction, trace elements, pathogenesis, iron deficiency.

Violations of the level of minerals in the human body play an extremely important role in the etiology, pathogenesis and treatment of many diseases. Deficiency of a number of essential essential trace elements (zinc, iron, copper) leads to a decrease in the body's resistance to adverse environmental factors, the formation of immunodeficiency states, disruption of the function of antioxidant defense systems, contribute to an increase in the frequency of; - atherosclerosis, coronary heart disease. Today, scientific and practical interest in the role of trace elements in the development of cardiovascular pathology is growing. It has been proved that trace elements such as zinc, iron, copper, being integral parts of a wide variety of enzyme systems, can have a significant impact on the course of MI, while the main point of application of their action is considered to be an active influence on the functioning of pro- and antioxidant systems.

Materials and methods: In the course of the study, the results obtained in domestic and foreign studies of recent years were studied. In order to analyze aspects of the pathogenesis of mineral level disorders among the published works, the results of a systematic review and meta-analysis were mainly studied. The conclusions of this work were formed on the basis of data collection and systematization. At the same time, the results of dissertation research were also studied. Special attention was paid to the level of reliability of the published works.

The results of the study. The processes of myocardial conduction and contractility, as well as changes in ECG parameters, largely depend on the state of the content and distribution of trace elements [9]. The change in ion exchange constants is considered by many authors to be one of the important links in the development of the processes of myocardial repair and damage in coronary heart disease and AMI [2]. Trace elements and enzyme systems containing trace elements play an important role in the mechanisms of angioprotection and antioxidant protection [3]. The essential role of the imbalance between prooxidant and antioxidant systems (including copper-zinc-dependent superoxide dismutase (Cu-Zn-SOD)) is shown in the pathogenesis of atherosclerotic vascular lesions. Today, special attention is paid to the study of the interaction of various elements, the importance of studying the imbalance of trace elements in the pathogenesis of cardiovascular diseases is emphasized [4,5].

Recently, active research has been conducted to study the influence of various environmental factors on the formation of immunity, among which an important role is assigned to the violation of homeostasis of trace elements [9, 10]. Among all trace elements, zinc is the most important for the adequate functioning of the immune system. Its immunotropic effect is diverse and

multidirectional and concerns all parts of the immunological, as well as non-specific protection of the body [2].

Zinc belongs to essential trace elements with a wide spectrum of action, participates in all types of metabolism. In the human body, Zn is a part of complex organic compounds with high biological activity in influencing growth, development and reproduction, protein and carbohydrate metabolism, and other processes that are associated with the action of both zinc-containing enzymes and enzymes activated by Zn. To date, the presence of Zn has been detected in 200 enzymes, in all 20 nucleotidyltransferases studied, and its discovery in reverse transcriptases for the first time allowed establishing a close relationship with the processes of carcinogenesis. More than 70 zinc proteids are known, many of which are metalloenzymes (DNA and RNA polymerase, thymidine kinase, etc.) that play an important role in the metabolism of nucleic acids and protein [2]. Zn blocks apoptosis of cells of various origins and its effect is mainly associated with the blockade of Ca+2-Mg+2 endonuclease activity [4]. The participation of zinc and copper in the regulation of platelet aggregation mechanisms is noted.

Zinc is a critical element in the proliferation, differentiation, maturation and activation of lymphocytes involved in humoral and cellular-mediator immunity. The administration of zinc aspartate significantly increased the concentration of T-lymphocytes in the blood serum of patients with primary and secondary immunodeficiency [8]. Zinc is associated with a series of components that form both the morphological structure and the basis of the immune system, as well as its function - intercellular interaction, thymulin synthesis, regulation of immunocompetent cells, regulation of the dynamics of cellular repopulation, primarily lymphocytes of the immune system (synthesis of the main histocompatibility complex), modulation of the activity of the immune response [8].

The significance of Zn is due to the fact that it is the active center of the cytosolic enzyme superoxide dismutase, acting as a powerful antioxidant. Zn improves the restoration of myocardial functions after its artificial stop. In addition, Zn, inhibiting the inactivation of nitric oxide by lipid peroxidation products, indirectly acts as a vasodilator [2]. It should be noted the participation of Zn in the mechanisms of hemocoagulation: platelet binding with high-molecular kininogen (Fitzgerald-Williams-Flozhak factor) occurs with the participation of Zna.

Zinc maintains the stability of cell membranes by limiting the release of histamine and mast cells. It limits the ability of iron to stimulate free radical reactions and thereby prevents damage to cell membranes. Zn is necessary for the normal activity of lymphoid tissue, which plays a huge role in immunogenesis [4,5].

The main cause of zinc deficiency is inadequate intake of zinc from food, which is facilitated by its initially low content in environmental objects. In addition, at present, due to a significant increase in the industrial load and environmental pollution with xenobiotics, artificial, anthropogenic deficiency of this vital trace element is becoming increasingly important [2].

A number of scientists have shown that patients in the acute stage of MI have a significant decrease in Zn content, the degree of decrease depends on the severity of the course of MI and is more significant with Q-positive MI with the presence of arterial hypertension (AH). In addition, according to the authors, hypocyncemia in patients with MI, especially in combination with hypertension, is an unfavorable sign and requires correction. A statistically significant decrease in the serum level of Zn in NS and MI was revealed in the first 6 hours after the onset of an anginal attack, with an increase in its level by the 18th day of treatment. In patients with Q-forming MI, the degree of decrease in the level of Zn in the blood serum was associated with an increase in the number of cardiac arrhythmias [1]. The inclusion of zinc-containing preparations in physiological (biotic) doses in the therapeutic complex contributes to the normalization of lipid metabolism and increases the effectiveness of treatment of patients with atherosclerosis and chronic ischemic heart disease [18,23]. Zinc preparations activate the cellular link of immunity, stabilize the membranes of mast cells, providing an anti-inflammatory immunomodulatory effect.

Copper is an essential trace element that is a cofactor of more than 30 different enzymes. A number of copper-dependent proteins are essential for the normal functioning of the circulatory system: Cu-Zn-SOD protects cell membranes from damage by active oxygen metabolites, lysyl oxidase is necessary for the synthesis of collagen and elastin (without which normal structural organization of the vascular wall is impossible), dopamine hydroxylase participates in the biosynthesis of catecholamines, cytochrome C plays a key role in the chain of tissue respiration, hefastatin regulates iron absorption, angiogenin plays an important role in capillarogenesis.

The Cu-containing enzyme ceruloplasmin also plays an important role in antioxidant defense mechanisms. The liver and its main structural elements, hepatocytes, play a key role in the metabolism of Si. Cu entering them through the portal vein system initially binds to metallothionein found in the liver [6,30].

The Cu content in plasma is regulated by neurohumoral mechanisms, and it is not the same in humans and different animals. In rats, for example, adrenalectomy leads to an increase in the level of Si in plasma, which persists even 10 months after surgery. Corticosterone and thyroxine cause a decrease in the content of Si in the blood. Pain irritation, stressful situations and infectious diseases cause an increase in Cu content, acting on the exchange of this metal partly through the neurohumoral system [4]. It has been shown that with NS and MI, there is an increase in the serum level of Si, by the 18th day of treatment, its decrease. The severity of the imbalance reflects the degree of myocardial damage. Severe cuprodeficiency is observed in patients with MI in combination with hypertension in the acute stage, similar changes were observed in groups of experimental animals [28].

Iron is a functionally necessary trace element of metabolism, which plays an important role in redox processes, erythropoiesis, tissue respiration and a number of biochemical reactions that determine the vital activity of the organism as a whole [11,20]. Fe is an indispensable component of hemoglobin and myohemoglobin, is part of more than 100 enzymes that control cholesterol metabolism, DNA synthesis, the quality of the immune response to viral or bacterial infection, the energy metabolism of cells, the reaction of free radical formation in body tissues [27,29]. Adequate iron content in the body contributes to the full functioning of factors of nonspecific protection, cellular and local immunity, plays an important role in the intensification of lipid peroxidation (POL) processes [4,18]. Transport and deposition is carried out by transferin, transferin receptor and ferritin. The synthesis of these proteins depends on the metabolic needs of the body in iron and is regulated at the transcription level. The properties of transferrin are closely related to the presence of ceruloplasmin, ferroosidase activity [5,16]. In oxidative reactions involving divalent iron ions, ceruloplasmin turns out to be the main antioxidant of blood plasma, a kind of "trap" for reactive oxygen species [5,14,15]. The tranferin-ceruloplasmin complex is an antioxidant system of blood serum. Their action is based on the oxidation of Fe ions and the binding of Fe+3, as well as the interaction of these proteins with oxygen radicals [5,17,19].

Tissue hypoxia leads to an increase in endogenous free iron in them and is closely correlated with the accumulation of POL products. Iron-containing proteins (hemoglobin, ferritin, transferin, lactoferin) can serve as a source of free iron ions in ischemic tissue. In the absence of oxygen in the tissues, the recovery potential of the intracellular medium increases, which leads to the release of iron and activation of POL [7,21].

Thus, hypoxia and subsequent reoxygenation are two stages of the same process, closely related to the pathology of iron metabolism as the main oxygen carrier. Clinical studies devoted to the study of serum Fe content in acute coronary syndrome are isolated [23,28,27,30].

With MI, one of the main signs of a violation of the pumping activity of the heart is hypoxia, which is primarily due to a decrease in the contractility of the damaged myocardium, leading to stagnation in the lungs, followed by the development of cardiogenic respiratory failure and a decrease in blood oxygenation [14,17,19]. The development of severe AMI with a Q wave was accompanied by a decrease in the Fe content in blood plasma, the changes found in dynamics

persisted after three weeks. In patients with AMI without a Q wave, the initially elevated Fe level remained the same during the dynamic study [7,22,25]. With multivessel lesions of the coronary arteries, the lowest indicators of hemoglobin, hematocrit and erythrocytes, and serum iron were noted [7,16].

According to modern data on the dynamics of heart performance during the hospital period of MI, a greater contribution to the development of tissue hypoxia is made by the insufficiency of the hemic component of the oxygen transport system [28, 30]. The significant importance of anemic syndrome as a risk factor for an unfavorable prognosis in various forms of coronary heart disease, in particular in ACS and heart failure, has been established [7,29].

Conclusion. The imbalance of mineral composition is important in the development of acute cardiac disorders, as well as in predicting the occurrence of early complications of AMI, primarily the development of acute left ventricular failure and cardiogenic shock. Based on the assessment of the content of essential minerals as markers of inflammatory processes, it is of great importance and can be used as predictors of predicting the most severe early complications in patients with acute myocardial infarction.

List of used literature

1. Мамасолиев, Н. С. Усмонов, Б. У., Шокирова, С. М., & Мавлонов, Н. Х. (2019). DIAGNOSTIC AND TREATMENT OF THROMBOCYPENESIC PURPLE AND THROMBOCYTOPATHY DURING PREGNANCY, CHILDBIRTH AND POSTBIRTH. *Новый день в медицине*, (4), 46-48.
2. Erkinovna, T. D., & Halimovich, M. N. (2022). Characteristics of the Main Indicators of the System, Hemostasis in Individuals with Arterial Hypertension. *International Journal of Formal Education*, *1*(1), 33-39.
3. Мавлонов, Н. Х. (2020). Распространенность хронических неинфекционных заболеваний среди неорганизованного населения пожилого и старческого возраста. *Новый день в медицине*, (4), 657-663.
4. Мавлонов, Н. Х. Мамасолиев, Н. С., & Мамасолиев, З. Н. (2020). Превентивные подходы к раннему выявлению и профилактике факторов риска неинфекционных заболеваний у лиц пожилого и старческого возраста. *Проблемы биологии и медицины*, *4*.
5. Мавлонов, Н. Х. (2021). Рахматова Дилбар Бахриддиновна Распространенность основных хронических неинфекционных заболеваний в связи с моделируемыми факторами риска среди населения пожилого и старческого возраста. *Электронный научный журнал «Биология и интегративная медицина*, (6), 46.
6. Xalimovich, M. N. (2021). Prevalence of modifiable risk factors for chronic noncommunicable diseases in the elderly and senile population. *ACADEMICIA: AN INTERNATIONAL MULTIDISCIPLINARY RESEARCH JOURNAL*, *11*(1), 1148-1153.
7. Andijan, N. S., Mavlonov, N. X., Rakhmatova, D. B., Radjabova, G. H., Manasova, G. M., Manasova, I. S., & Jalilova, U. D. (2018). Main risk factors and prevention routes for chronic noninfectious diseases. *Asian Journal of Multidimensional Research (AJMR)*, *7*(12), 48-53.
8. Bahriddinovna, R. D., Khasanbaevich, T. K., & Khalimovich, M. N. (2021). Features of the Frequency of Acute Myocardial Infarction among the Inorganized Population of the Elderly and Old Age. *International Journal of Modern Agriculture*, *10*(1), 995-1004.
9. Мавлонов, Н. Х., Усманов, Б. У., Мамасалиев, Н. С., Каримов, У. Б., & Эргашбоева, Д. А. (2019). ПРОФИЛАКТИКА ОСТРЫХ КОРОНАРНЫХ СИНДРОМОВ У ЖЕНЩИН НЕ ДОЛЖНО ОТЛИЧАТЬСЯ ОТ ПРОФИЛАКТИКИ МУЖЧИН: ФОКУС НА РЕГИСТРАЦИОННО-НАБЛЮДАТЕЛЬНОЕ ИССЛЕДОВАНИЕ В ФЕРГАНСКОЙ ДОЛИНЕ. *Новый день в медицине*, (3), 154-157.

10. Мавлонов, Н. Х, Каримов, У. Б. & Эргашбоева, Д. А. (2019). «ВАЖНЫЕ ЭПИДЕМИОЛОГИЧЕСКИЕ ИНСТРУМЕНТАРИИ» ДИАГНОСТИКИ ОСТРЫХ КОРОНАРНЫХ СИНДРОМОВ В ИЗМЕНЕННЫХ КЛИМАТИЧЕСКИХ УСЛОВИЯХ ФЕРГАНСКОЙ ДОЛИНЫ УЗБЕКИСТАНА. *Новый день в медицине*, (4), 174-176.
11. Мавлонов, Н. Х. (2022). COVID-19 БИЛАН КАСАЛЛАНГАН БЕМОРЛАРНИНГ ОЗИҚЛАНИШИ БИЛАН БОҒЛИҚ МУАММОЛАРИ. *TA'LIM VA RIVOJLANISH TAHLILI ONLAYN ILMIY JURNALI*, *2*(12), 64-67.
12. Мавлонов, Н. Х. (2020). Распространенность основных хронических неинфекционных заболеваний в связи с модифицируемыми факторами риска среди населения пожилого и старческого возраста. *Биология и интегративная медицина*, (6 (46)), 123-139.
13. Аслонова, Ш. Ж., Косимов, У. У., Мавлонов, Н. Х., & Мусаева, Р. Х. (2015). Применение моксонидина и метформина при метаболическом синдроме. *Наука молодых–Eruditio Juvenium*, (3), 29-39.
14. Мавлонов, Н. Х. Рахматова Дилбар Бахриддиновна. *Инструменты моделирования-основа высшего образования. Электронный научный журнал «Биология и интегративная медицина. 2021г. S-специальный выпуск С.-120-124*.
15. Nazarova, F. (2022). Qaridoshlar orasidagi ofat. *Scientific progress*, *3*(1), 663-669.
16. Мавлонов, Н. Х. (2017). Problem of rheumatoid arthritis and strategy of his treatment. *Биология и интегративная медицина*, (6), 37-47.
17. Khalimovich, M. N. (2023). ACUTE CORONARY SYNDROME AND ITS MODERN PRESSING PROBLEMS. *EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE*, *3*(6), 17-21.
18. Мавлонов, Н. Х. (2022). Частота Основных Неинфекционных Заболеваний У Пожилого И Старческого Населения. *INTERNATIONAL JOURNAL OF HEALTH SYSTEMS AND MEDICAL SCIENCES*, *1*(6), 264-272.
19. Halimovich, M. N., & Iskandarovna, J. H. (2022). Risk Factors For Noncommunicable Diseases And Prospects For Prevention.(Literature Review). *Journal of Pharmaceutical Negative Results*, 4206-4210.
20. Halimovich, M. N., & Sharifovna, Y. H. (2022). DIAGNOSIS AND TREATMENT IN AUTOIMMUNE THYROIDITIS. *BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI*, *2*(11), 63-69.
21. Nazarova, F. I. (2022). ABU ALI IBN SINONING SOG ‘LOM TURMUSH TARZINI SHAKILANIRISHI HAQIDA. *Scientific progress*, *3*(1), 1137-1142.
22. Salievich, M. N., Halimovich, M. N., Sharifovich, T. M., & Bahritdinovna, R. D. (2021). Gerontological and Geriatric Aspects of Prevention of Non-Communicable Diseases: Current Problems from the Data of Epidemiological Situations in the World. *Annals of the Romanian Society for Cell Biology*, 5162-5171.
23. Мавлонов, Н. Х., & Рахматова, Д. Б. (2021). Инструменты моделирования-основа высшего образования. *Биология и интегративная медицина*, *47*(S1), 120-124.
24. Ilhomovna, N. F. (2022). DORIVOR O’SIMLIKLARNING O’ZBEKISTONDAGI AHAMIYATI. *BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI*, 507-512.
25. Мавлонов, Н. Х. (2017). Хна лекарственное и косметическое средство. *Биология и интегративная медицина*, (6), 54-68.
26. Мавлонов, Н. Х. Рузиев, О. А., Сафаров, Н. Ш., & Тоиров, М. Ш. (2007). Возможности эффективного использования методов контрацепции в условиях городской врачебной поликлиники. *Врач-аспирант*, *18*(3), 235-238.

27. Мавлонов, Н. Х. (2023). Острый Коронарный Синдром И Сердечная Недостаточность. *Research Journal of Trauma and Disability Studies*, *2*(4), 126-128.

28. Мавлонов, Н. Х. (2023). ЎТКИР КОРОНАР СИНДРОМ ВА ЮРАК РИТМИНИНГ ҲАЁТГА ХАВФ СОЛУВЧИ БУЗИЛИШЛАРИ. *BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI*, *3*(4), 184-187.

29. Nazarova, F., & Hudaikulova, N. (2019). Healthy generation-the basis of a healthy family. *Scientific and Technical Journal of Namangan Institute of Engineering and Technology*, *1*(7), 69-73.

30. Мавлонов, Н. Х. (2022). Изменения Основных Показателей Гемостаза При Гипертонической Болезни. *Central Asian Journal of Medical and Natural Science*, *3*(6), 335-338.

31. Мавлонов, Н. Х. (2022). ИННОВАЦИИ В ОБРАЗОВАНИИ ПЕРСПЕКТИВА ОБРАЗОВАТЕЛЬНОГО ПРОЦЕССА. *TA'LIM VA RIVOJLANISH TAHLILI ONLAYN ILMIY JURNALI*, *2*(12), 61-63.

32. Мавлонов, Н. Х. (2022). Немедикаментозные Методы Лечения Артериальной Гипертензии В Сравнительная Аспекте. *Central Asian Journal of Medical and Natural Science*, *3*(6), 326-334.

33. Яхъяева, Х. Ш. & Мавлонов, Н. Х. (2022). ЛЕЧЕНИИ НЕЙРОИММУНОЭНДОКРИННЫХ НАРУШЕНИЙ ПРИ АУТОИММУННОМ ТИРЕОИДИТЕ. *BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI*, *2*(11), 56-62.

34. Mavlonov, N. H., & Kh, F. S. (2022). COVID-19 DISEASE AND THE PROBLEM OF POST-COVID SYNDROME. *FAN, TA'LIM, MADANIYAT VA INNOVATSIYA*, *1*(4), 17-22.

35. Мавлонов, Н. Х. & Хамитов, Т. Т. (2022). БЎЛМАЧАЛАР ФИБРИЛЛЯЦИЯСИДА ФИБРОЗ КЎРСАТКИЧЛАРИНИНГ МИОКАРД РЕМОДЕЛЛАНИШИГА ТАЪСИРИ. *Uzbek Scholar Journal*, *5*, 197-203.

36. Mavlonov, N. X., & Halimov, N. N. (2022). HISTORY OF THE DEVELOPMENT OF HIV-RELATED DISEASES. *Journal of Integrated Education and Research*, *1*(1), 527-536.

37. Мавлонов, Н. Х., & Турсунова, Д. Э. (2022). РАСПРОСТРАНЕННОСТЬ ФАКТОРОВ РИСКА, ОБУСЛОВЛЕННЫХ ОБРАЗОМ ЖИЗНИ, У ЛИЦ МОЛОДОГО ВОЗРАСТА С АРТЕРИАЛЬНОЙ ГИПЕРТЕНЗИЕЙ. *Scientific progress*, *3*(1), 683-691.

38. Baxriyevna, P. N., & Ilxomovna, N. F. (2023). EFFECTIVE METHODS FOR THE FORMATION OF COMMUNICATIVE CULTURE IN PRIMARY SCHOOL STUDENTS BASED ON AN INTEGRATIVE APPROACH. *IQRO*, *2*(1), 257-261.

39. Ilhomovna, F. N. (2022). Let" Wolf Mouths" and" Hares" Not Be Born.... *Research Journal of Trauma and Disability Studies*, *1*(12), 38-44.

40. Мавлонов, Н. Х. (2018). Major factors of risk and way of prevention of chronic noninfectious diseases (review of literature). *Биология и интегративная медицина*, (3), 78-90.

41. Ilxomovna, N. F. (2023). Premature Birth and Hereditary Diseases in Children Detection Software. *Scholastic: Journal of Natural and Medical Education*, *2*(4), 113-118.

42. Ilhomovna, N. F. (2023). A Healthy Child is a Guarantee of Family Joy and a Country Prospect. *Scholastic: Journal of Natural and Medical Education*, *2*(2), 127-131.

43. Раджабова, Г. Х., Рахматова, Д. Б., & Мавлонов, Н. Х. (2018). ОПЫТ И МЕСТО БУХАРСКОГО ГОСУДАРСТВЕННОГО МЕДИЦИНСКОГО ИНСТИТУТА ПО ПОДГОТОВКЕ КАДРОВ В СТАНОВЛЕНИИ СЕМЕЙНОЙ МЕДИЦИНЫ. *Теория и практика современной науки*, (5 (35)), 698-703.

44. Шарипова, Н. Д. Кароматов, И. Д., Рузиев, О. А., Таиров, М. Ш., Мавлонов, Н. Х., & Бадриддинова, М. Н. (2006). Уровни обработки информации, концепция" лиц" и вопросы применения их в практике семейного врача. *Врач-аспирант*, *13*(4), 367-371.

45. Ilxomovna, N. F. (2023). GROUP PLAY THERAPY AS A METHOD OF PRESERVATION MENTAL HEALTH OF THE CHILD. *IQRO*, *2*(1), 262-267.

46. Шарипова, Н. Д. Кароматов, И. Д., Рузиев, О. А., Таиров, М. Ш., Мавлонов, Н. Х., & Бадриддинова, М. Н. (2006). Уровни обработки информации, концепция" лиц" и вопросы применения их в практике семейного врача. *Врач-аспирант*, *13*(4), 367-371.

47. Nazarova, F. I. (2023). MEDICAL BIOLOGY READ THE SCIENCE THE USE OF EDUCATIONAL FILMS. *Horizon: Journal of Humanity and Artificial Intelligence*, *2*(4), 154-159.

48. Khalimovich, M. N. (2023). ACUTE CORONARY SYNDROME AND ITS MODERN PRESSING PROBLEMS. *EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE*, *3*(6), 17-21.

49. Мавлонов, Н. Х. (2023). ЎТКИР КОРОНАР СИНДРОМ ВА ЮРАК РИТМИНИНГ ҲАЁТГА ХАВФ СОЛУВЧИ БУЗИЛИШЛАРИ. *BARQARORLIK VA YETAKCHI TADQIQOTLAR ONLAYN ILMIY JURNALI*, *3*(4), 184-187.

50. Рахматова, Д. Б., Раджабова, Г. Х., Мавлонов, Н. Х., & Нурова, Н. С. (2018). ОЦЕНКА ФАКТОРОВ РИСКА ИБС У ЛИЦ СТАРШЕ 60 ЛЕТ СРЕДИ НАСЕЛЕНИЯ ГОРОДА БУХАРЫ. *Теория и практика современной науки*, (5 (35)), 704-708.