



## Innovative ideas about atherosclerosis

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### ABSTRACT

This review presents a modern concept of the factors that contribute to the development of the cardiovascular system. It is noted that local inflammatory reactions in the walls of blood vessels and disruption of lipid metabolism in the course of hypercholesterolemia play an important role in the development of atherosclerosis. The pathogenesis of this condition is multifactorial.

### Keywords:

atherosclerosis, inflammation, pathogenetic factors, lipid spectrum, antioxidant system, etiology, hypercholesterolemia, pathology.

Atherosclerosis is a chronic arterial and muscular disease that occurs due to lipid metabolism disorders and is accompanied by the deposition of cholesterol, as well as some lipoproteins, in the intima of blood vessels. Currently, throughout the world and in our country, this pathological condition of the body is one of the most pressing problems of modern medicine. The reason for the urgency of researching this disease is the widespread distribution of the disease, long latent course, and pronounced unfavorable results. Literary statistics show that the number of deaths from the consequences of cardiovascular diseases, in which atherosclerosis plays a leading role, continues to increase over the past ten years [13], mortality from CVD is 57%, with almost 20% dying at working age [12]. Despite this, there is a tendency to "rejuvenate" such diseases.

**Purpose of the study:** to study the modern understanding of the etiopathogenesis of atherosclerosis.

### Material and methods.

Studies are search results from PubMed, ISI Web of Science, EMBASE, and the Cochrane Library. Based on a thorough study of the material, starting with the creation of relevant studies, a conclusion was drawn.

### Results and discussion.

In the modern world, the frequency of occurrence of a pathological condition is determined by factors such as changes in a person's social environment. Three areas play an important role in the development of atherosclerosis. The first direction is associated with a violation of lipid metabolism, the second, undoubtedly, with a change in rheological properties, namely with the state of the coagulating system. The third aspect of the development of the pathology we are studying is the mechanism of disruption of cellular functions. If we consider disorders of lipid metabolism in the bloodstream, then the content of cholesterol in high concentrations

plays an important role. In the blood, cholesterol is carried by special spherical particles consisting of protein and lipids, from which the name "lipoproteins" comes, which differ in composition and functions in metabolism: high-density lipoproteins (HDL), low-density lipoproteins (LDL) and very low-density lipoproteins (LpONP). The basis of atherogenic lipoproteins is LDL; in blood serum their content is 60-70% of total cholesterol [16].

In various regions of Uzbekistan [5], the level of primary disability is determined, which depends on the influence of climate factors and the social, economic and demographic situation, the level of quality of medical services, medical examinations and other conditions. In this regard, the regional specificity of population diseases associated with the main CVD diseases - hypertension and coronary heart disease, which are often the causes of permanent disability, directly affects the level and structure of disability by age and gender of the population [18].

As a result of the accumulation of lipids on the vascular wall, a local inflammatory reaction occurs: inflammatory factors attract macrophages, leading to accumulation in the vascular intima. With age, the endothelium is replaced by connective tissue, which with age begins to extend into the lumen of blood vessels. Inflammation promotes the formation of smooth muscle tissue. An active macrophage begins to express receptors capable of binding microorganisms associated with atherosclerosis, for example, cytomegaloviruses, *Chlamydia pneumoniae*, periodontal microflora, as well as *Helicobacter pylori*. Their presence makes it possible to maintain the activity of microorganisms, long-term inflammatory reactions, and stabilize the plaque of atherosclerosis. [14]. Thus, chemotaxis factors, which are associated with the primary attraction of the phagocyte to the site of infection, belong to chemotaxis protein-1. Atherosclerosis is a contradictory process of inflammation. On the one hand, it is aimed at increasing atherosclerotic plaques, but can also lead to its destabilization [14, 22].

Atherosclerosis also plays a role in the systemic inflammatory process. For example, patients with rheumatological disease and its complications often experience elevated cholesterol levels, which are not associated with other risk factors, but directly depend on the activity of the inflammatory process. An increase in ESR concentration as a direct indicator of the inflammatory process is the reason for a higher risk of developing diseases of the cardiovascular system, and such data for C-reactive protein have not been obtained to date. High activity of psoriatic arthritis is associated with a higher likelihood of developing cardiovascular disease. Systems have established correlations between a long period of persistence and elevated interleukin-6 and the development of atherosclerosis [6]. The inflammatory process increases the likelihood of developing cardiovascular pathology, regardless of other risk factors, and itself changes the lipid spectrum, which leads to an increased risk of developing the pathology we are studying [9].

In addition, microsatellite instability can be observed in atherosclerotic plaques [11, 15]. In smooth muscle cells, fibrous sheathed telomeres are shorter in length than those of normal media, indicating oxidative stress. Shortening of leukocyte telomeres was also observed. This feature does not relate to age, which indicates a genetic predisposition to the development of atherosclerosis. In the absence of other risk factors for the development of atherosclerosis, there is evidence that genetic factors influence the formation of cardiovascular pathology [8, 15].

Dyslipidemia is one of the main factors of high risk for the development of atherosclerosis and its complications [1].

Therefore, pharmacotherapy aimed at normalizing the level of total cholesterol in the blood and the most atherogenic fractions - LDL - is the main part of the program for the prevention of atherosclerosis.

So-called "courses" of treatment do not exist, since statins help achieve strategic goals - to prevent premature death, heart attack and other serious complications of atherosclerosis [2, 6]. Therefore, normalization of altered

levels of lipids in the blood is an important part of the prevention of atherosclerotic diseases in a healthy person with various risk factors and the treatment of patients with atherosclerosis [3, 4].

The WHO report on the problem of atherosclerosis takes into account the most reliable studies to identify the group of people at high risk of developing this disease. 6 main principles are proposed aimed at the prevention and treatment of atherosclerosis: removal of atherogenic lipoproteins, stimulation of reverse transport of cholesterol through LIP and phospholipid analogues; diets with limited consumption of cholesterol-containing foods; inhibition of cholesterol biosynthesis; induction of cholesterol oxidation; improvement of the rheological properties of blood and antiplatelet properties of endothelial cells [3, 10, 16].

The main functions of a GP for outpatient treatment of cardiac patients:

1. Providing consultations to local therapists to identify and treat patients with CVD.
2. Clinical observation of patients with complications.
3. Control, analysis of work with patients with CVD.

Help for patients with cardiovascular diseases at home, in hospitals and hospitals is provided by a comprehensive list of types of medical care, i.e. compulsory health insurance program [17].

### Conclusion

Thus, the process of atherosclerotic pathology accompanies a person throughout his life, from the stage of formation of the lipid layer in childhood to various complications in old age. The pathogenesis of this condition is multifactorial. The discovery of new pathogenetic zones and the creation of a list of patients with this disease will allow the development of new diagnostic methods, promoting the diffusion of stages of the disease, which will reduce the mortality and morbidity of the pathology we are studying, namely atherosclerosis [19-21].

### List of used literature.

1. Aleksandrovsky A. A. et al. Cardiological publications-summaries with comments // Russian Journal of Cardiology. – 2011. – №. 6. – pp. 105-108.
2. Bockeria L.A. et al. Cardiovascular surgery-2017. – Federal State Budgetary Institution "National Scientific and Practical Center for Cardiovascular Surgery named after AN Bakulev" of the Ministry of Health of the Russian Federation, 2018.
3. Vorobyova E. N, Simonova G. I, Varshavsky B. Y. Organization of primary and secondary prevention of cardiovascular diseases on the basis of a specialized center // Disease prevention and health promotion. – 2002. – T. 5. № 4. – pp. 20-24.
4. Gordeeva M.V, Veleslavova O.E, Baturova M.A. Journal "Emergency Medicine" 4 (59) 2014 // Journal "Emergency Medicine. – 2014. – T. 4. – P. 59.
5. Dzhusipov A.K., Amanov T.I., Shyngisova F.S., Oshakbaev K.P., Abylayuly Zh. Regional characteristics of population health and the state of therapeutic services in the East Kazakhstan region for 20042-2004 // Problems of social medicine and healthcare management.-2006. №. 38(1)-P.125-129
6. Drapkina O. M. et al. Prevention of chronic non-infectious diseases in the Russian Federation. National guidelines 2022 // Cardiovascular therapy and prevention. – 2022. – T. 21. – №. 4. – P. 5-232.
7. Zakharov V.V. Atherosclerosis of cerebral and peripheral arteries: issues of therapy // Rus. honey. and. – 2007. – T. 15. – №. 10. – pp. 833-836.
8. Kutikhin A. G., Sinitsky M. Yu., Ponasenko A. V. The role of mutagenesis in the development of atherosclerosis // Complex problems of cardiovascular diseases. – 2017. – T. 6. – №. 1. – pp. 92-101.
9. Ruf R.R. The role of inflammation in the development of atherosclerosis and cardiovascular events // Siberian Medical Review. – 2015. №. 6 (96). – pp. 23-29.
10. Samorodskaya I.V., Semenov V.Yu. Lost years of potential life from diseases of the circulatory system of the economically

- active population of the Russian Federation in 2013-2019 //Russian Journal of Cardiology. – 2021. – №. 5. – pp. 82-87.
11. Troshina A. A. Disaggregant therapy - secondary prevention of coronary heart disease // Breast cancer. – 2018. – T. 26. – No. 11-1. – P. 54-58. Fedorova T. A. et al. Clinical and morphological aspects of infective endocarditis // Clinical medicine. – 2014. – T. 92. – №. 7. – pp. 68-73.
12. Khalilova Sh. R., Turdikulova Z. R. Determination of the residual content of pesticides in anti-sclerotic collection // Flora and Vegetation of Altai. – 2021. – T. – P. 102-104
13. Hamerman D. Osteoporosis and atherosclerosis: biological connections and emerging common treatment methods // Breast Cancer. – 2008. – T. 16. – №. 9. – pp. 625-632.
14. Tsubulkin N. A. et al. Inflammatory mechanisms in the pathogenesis of atherosclerosis // Practical Medicine. – 2016. – T. 2. – No. 4 (96). – pp. 165-169.
15. Alshaarawy O., Elbaz H. A., Andrew M. E. The association of urinary polycyclic aromatic hydrocarbon biomarkers and cardiovascular disease in the US population //Environment international. – 2016. – T. 89. – P. 174-178.
16. <https://articlekz.com/article/40666>
17. [http://studopedia.su/10\\_148736\\_bolezni-sistemi-krovoobrashcheniya-kak-mediko-sotsialnaya-problema-profilaktika.html](http://studopedia.su/10_148736_bolezni-sistemi-krovoobrashcheniya-kak-mediko-sotsialnaya-problema-profilaktika.html)
18. <http://www.fesmu.ru/elib/Article.aspx?id=65573>
19. Patel V. B. et al. Angiotensin II induced proteolytic cleavage of myocardial ACE2 is mediated by TACE/ADAM-17: a positive feedback mechanism in the RAS //Journal of molecular and cellular cardiology. – 2014. – T. 66. – C. 167-176.
20. Rohla M., Weiss T. W. Metabolic syndrome, inflammation and atherothrombosis //Hämostaseologie. – 2013. – T. 33. – №. 04. – C. 283-294.
21. Rohla M., Weiss T. W. Metabolic syndrome, inflammation and atherothrombosis //Hämostaseologie. – 2013. – T. 33. – №. 04. – C. 283-294.
22. Rosenfeld M. E., Campbell L. A. Pathogens and atherosclerosis: update on the potential contribution of multiple infectious organisms to the pathogenesis of atherosclerosis //Thrombosis and haemostasis. – 2011. – T. 106. – №. 11. – C. 858-867.