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Review Article

Atherosclerosis and Human Life Expectancy

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Abstract

The relationship between a person's lifestyle and the degree of atherosclerosis is very important. Trying to find such a connection is the goal of many researchers. It is also the purpose of the author's work, a brief description of which is given in this review.

Method: Study of information on the Internet, participation in medical conferences, participation (only for 2021) in 3 international webinars on atherosclerosis, publication of articles.

Results: The importance of this issue for modern man is very great.

Keywords: atherosclerosis; polyethological.

Introduction

From the point of view of medicine, atherosclerosis is a polyethological disease, in the occurrence and progression of which many external and internal factors, called risk factors, are important. More than 30 factors are now known, the action of which increases the risk of the occurrence and development of atherosclerosis and its complications. Here are some of them: age, gender, heredity, dyslipidemia, hypertension, type 2 diabetes, smoking, poor nutrition, hyperhomocysteinemia, inflammation, components of an unhealthy lifestyle (obesity, physical inactivity, eating with excessive consumption of saturated fats and refined carbohydrates).

As we can see, the degree of atherosclerosis depends on age, and no one can escape from this risk factor. Atherosclerosis usually begins at a young age, and by the age of 40-50, in fact, it is found in everyone. The walls of the artery become stiffer, while there is a decrease in the internal diameters of various arteries (by 10%, by 50%, by 70%), and reduced vascular lumen causes minor or significant ischemia of many organs. At the same time, the external diameter of the arteries may change, but very slightly. In turn, ischemia of organs such as the heart and brain are the cause of most cardiovascular diseases (CVD), including the most dangerous: heart attacks and strokes. Organ ischemia can also lead to cancer [1]. An important work on the study of CVD and oncology [2], published in Oxford University Press (2019), states the following: "The majority (76.3%) of all deaths associated with cardiovascular diseases in cancer patients were caused by heart disease."

About 50% of modern people die prematurely from the effects of CVD and cancer. It can be said that a person's life expectancy depends entirely on the degree of atherosclerosis, vascular stiffness and the number of plaques in the arteries.

An intensive search has been going on for at least 200 years, about 13 Nobel Prizes have been awarded for the creation of supposedly "theories" of atherosclerosis, but still, the cause and mechanism of the disease remain unknown. It is only reliably known that with atherosclerosis, the lipid metabolism of cholesterol (HC) and low-density lipoproteins (LDL) is disrupted, and alterations of the internal walls of the arteries occur. But to the question "What is the reason for the violation?" - there is no answer.

Some representatives of official medicine admit that atherosclerosis is the most important and yet unsolved disease of mankind! And this disease affects every person throughout his life.

What are the official medical recommendations for the prevention and treatment of atherosclerosis now? The recommendations are about the same all over the world.

In Russia, according to the National Society for the Study of Atherosclerosis, the need for regular diagnosis and correction of lipid metabolism disorders (2020) has been confirmed [3].

The final document was prepared by a working group consisting of 49 people headed by Professor V.V. Kukharchuk (Moscow). We can say that this is the collective work of the best cardiologists in Russia.

In the VII revision, it was recorded that statins significantly reduce morbidity and mortality from CVD in all age groups.

It is confirmed that the cause of most CVD is precisely atherosclerosis. It is possible to influence the development of these diseases only by influencing their main pathogenetic link - dyslipidemia. In recent years, significant progress has been allegedly achieved in the diagnosis and therapy of atherosclerosis. Biochemical, instrumental and genetic

diagnostic methods have been improved. Innovative nutrition strategies have been developed. A real breakthrough has occurred in the development of fundamentally new medicines based on monoclonal antibodies, genetically engineered structures.

As a result of the revision, a lower target level of LDL was proposed for the very high risk category - 1.4 mmol/l.

The category of extreme risk has been introduced.

The descriptions of the categories of high and very high risk have been supplemented by not only indicating the degree of stenosis, but also the severity of atherosclerotic artery damage.

Some chapters have been expanded and updated, including those concerning type 2 diabetes mellitus and hypertriglyceridemia.

Thus, it can be stated that a lot has been done, but nothing really revolutionary has been proposed in the fight against atherosclerosis at the present stage (2020). As before, in medicine, the search for causality and prevention of atherosclerosis is carried out by a random method, in numerous directions.

Fortunately, there is not only official medicine. That's what some ancient and modern researchers say about prolonging a fleeting life.

The following are special methods of prevention and treatment of CVD. We can assume that these are the opinions of the most active and caring healers. Do not look down on the conclusions of healers, perhaps in their practices, covering thousands of potential patients, there are some hints of the key to the problem.

1) Breathing practices. A lot of special breathing exercises have been invented to improve health. K.P. Buteyko, A.N. Strelnikova, V.F. Frolov, Yu.G. Vilunas, John Grinder, K. Grof, Wim Hof and others worked in this field. Some elements of these exercises are found in the ancient teachings of "yoga" and "qigong". To the surprise of uninitiated people, in recent years "sobbing", "paradoxical", "endogenous", "square", "conscious" and other variations of respiratory movements have been invented. According to the authors of the exercises, it is their breathing practice that is the best, it significantly improves health and treats atherosclerosis!

We often hear about the invention of another new respiratory gymnastics. However, the set of breathing exercises of these gymnastics does not go beyond the yogic six classical exercises and three rhythmic types of breathing. All the useful "latest" breathing techniques, upon closer examination, turn out to be one of the variants of Pranayama [4].

From the author of the article. I don't think that all the researchers only wanted to earn money, to raise their prestige. They got ahead in the fight for health, but they could not explain their findings correctly. Therefore, many potential patients react skeptically.

People who practice breathing exercises claim that with the help of simple exercises it is possible to alleviate the symptoms of depression, anxiety, stress states. This is confirmed by research. In 2015, 69 patients of the Milan Fatebenefratelli e Oftalmico hospital suffering from depression and anxiety disorders were offered a new treatment method. For two weeks, the participants of the experiment performed breathing exercises combined with yoga exercises for several hours a day. After graduation, most of them improved their emotional state. There are studies confirming that conscious breathing lowers blood pressure, relieves depression, diabetes, asthma, migraine, chronic pain, strengthens the immune system, improves memory and attention [5].

Singing. Singing is a unique way of restoring and improving the human body. The positive effect of singing on the human heart is a scientifically proven fact, the vast majority of professional singers are long-livers [6].

Scientists at the University of Gothenburg (Sweden) have established how singing affects the human heart. It turns out that regular one-hour vocal classes have the same positive effect on the body as daily two-hour physical education or yoga classes.

Scientists from the USA (Harvard and Yale Universities) we found out that of all the American states, Connecticut (a state in the northeastern United States) has the highest life expectancy. It is there that most of the residents have been singing in the choir since childhood.

English scientists from the Cardiff Institute have revealed positive dynamics in singing (especially choral) in patients with oncological and cardiological diseases.

Some psychologists and doctors are convinced that singing is good for health in any case, regardless of the ability to sing, i.e. from the presence of vocal data.

2) Laughter. There is a whole science that studies laughter. This is gelotology. For example, it has been proven that laughter (including fake laughter) promotes a powerful release of endorphins, also known as hormones of joy, laughter increases blood oxygen saturation. There are many confirmations on the Internet. In addition, laughter activates the brain, suppressing the body's response to stress.

Laughter increases life expectancy and improves its quality. Comparing the life expectancy of famous theater actors over the past 270 years, Swedish doctors have revealed an unexpected pattern: comedians live much longer than tragedians.

3) Playing the flute or other small wind instrument. The flute, the instrument of kings, not only delighted the ears and entertained royalty, but also took care of their health. Playing the flute strengthens the respiratory system, and breathing, as you know, is life: long-term practice has a tangible positive effect on all body systems [7]. Of course, most modern people treat breathing practices, singing, laughing and "playing the flute" critically, sometimes as some kind of oddities of authors whose works do not deserve attention. And in vain…

Let's move on to the main part of this article.

So, on the official side we have "cholesterol, LDL and atherosclerosis, plaques", and on the other, folk, "breathing practices, singing, laughing, playing the flute and improving the cardiovascularsystem".

How to link the knowledge of official medicine together with its institutes, academies, with huge staffs of researchers and a small detachment of the most proactive researchers in the world?

There is a connection, and the New Theory of atherosclerosis reveals this connection [8-11].

It turns out that this atherosclerosis is not a multifactorial disease, as medical scientists have been trying to explain to us for the last hundred years. It turned out that there is a clear physical reason: with an increase in blood pressure (during stress), arterial blood leaks [12] through large anastomoses into the veins. Due to leaks, the volume of arterial blood decreases, while the venous volume increases. Leaks cause transverse stretching of the walls of the arteries inwards, in the direction of reducing the lumen of the vessels. The internal walls of the arteries are trying to collapse, because the internal volume of arterial blood has decreased, but the external walls, surrounded by a denser adventitia, do not allow this to be done quickly. Therefore, when the walls are stretched transversely in the multilayer structure of the artery walls, there is a drop in tissue pressure and "suction" of blood, interstitial fluid into the walls of the arteries directly from the main stream or from the outside of the arteries.

These physical forces in the vessels resemble the work of an accordion player when stretching the bellows of an accordion. At the same time, the

accordion bellows draw air (and dust) through any holes in the instrument, this happens precisely when the internal volume of the bellows expands. By exactly the same forces in the arteries, the lightest fractions from the blood (LDL) are first drawn into the walls of the arteries and fixed there, which causes inflammation.

On this, the above mechanism of development of atherosclerosis, the chairman of the National Society of the Russian Federation for the Study of Atherosclerosis V.V. Kukharchuk noticed that he is a doctor, not a biophysicist, and it seems to him that something is wrong here, it is necessary to consult with physiologists. My waiting for a reasoned answer dragged on for a long time.

So, during the day, with a vertical spine due to gravity, excess venous blood in physically passive people tends to accumulate in the legs and in the pelvic organs, which is the cause of varicose veins. In addition, for vertically positioned vessels, the natural forces of separation of the inner layer of the walls of the arteries (intima) from the middle layer, the maximum is reached in the upper parts of the vessels, because the forces F are proportional to the product F = m * g* H, where m is the mass, g is the acceleration of gravity, H is the height of vertically arranged vessels, therefore vertical vessels begin to increase their hardness from the inside, sometimes these forces lead to stratification of the layers of the walls of the arteries or aorta. Most often and first of all, the dissection begins from the upper parts of the vessels, for example, from the aortic arch, in the cervical and coronary vessels. (In this consideration of stresses on the walls of vessels, the author considers only static forces.)

Further, with an imbalance in the volumes of arterial and venous blood (standard rate 15% : 85%), a reduced volume of arterial blood leads to a forced decrease in the volume of the arterial bed, which reduces the lumen of the arteries, in other words, there is a deformation of the arteries in the form of a "spasm". There can be no other way, because the volume of arterial blood and the internal volume of the arterial bed are always equal to each other, and taking into account the pulse wave, too. A decrease in vascular lumen causes a decrease in the area of the inner surface of the endothelium, which leads to its damage, there is an alteration of a single-layer row of endothelial cells: the cells shrink, the gaps between them decrease, cells become dual-core, they crawl on top of each other. The inner lining of the arteries becomes not smooth, rough, the cells swell, break away from intima - there is an alteration of the endothelium. On the other hand, a decrease in vascular lumen causes transverse stretching of muscle fibers in the middle elastic layer of the arteries, directed from the rigid adventitia to the central axis of the arteries. This leads to negative pressure in the soft, elastic middle layer (in the media). To equalize the pressure, a pathological forced "suction" of any fluids occurs either through the endothelium from the lumen of the arteries, or through the outer shell of the arteries (adventitia). Since the inner lining of the arteries is the weakest insulating link, various particles are absorbed into the media through the intima and endothelium, but primarily the lightest fractions of blood, such as LDL.

Yellow spots on the inner wall of the arteries are the first stage of "sucking" fluids in young people, while it is the light (weightless) fractions that are primarily attracted, transformed and "glued". This usually occurs in the most vulnerable places: in the bends of the arteries, in the bifurcation zones, in those places where the "suction" forces are greater. The "suction" pattern for an external observer is similar to the attraction of iron filings to a magnet, but small filings cannot penetrate into a solid strong magnetized part, but LDL can pass through the inner wall of the arteries, because the resistance of the endothelium damaged in some places due to spasms is insufficient. Therefore, LDL and other particles penetrate into the walls of the arteries and cause inflammation, because these cells should not be there. This is how endothelial dysfunctions arise and progress, the stiffness of the walls increases, the growth of plaques and inflammatory foci in the walls of the arteries along their entire length, but primarily in large arteries near and above the "pump", i.e. the heart.

Periodic, but many hours of pressure difference in different layers of the arteries (usually during the day due to anxiety and stress during sedentary work) is the physical cause of atherosclerosis. Of course, after a few minutes or hours, due to the additional work of the small circle of blood circulation (especially well after physical and/or respiratory loads, and for physically passive people during sleep, lying down), the volume of arterial blood is restored, while the pressure difference in the layers of the arteries disappears, and the "suction" of fluids disappears. The reason for the imbalance of pressure in the walls of the arteries after a full rest temporarily disappears. But the harm from many hours of lack of arterial blood gradually accumulates, because the imbalance in the walls of the arteries is repeated almost every day. And so all life.

It becomes clear why LDL penetrates under the endothelium into the middle muscle layer of the artery walls and is fixed there. All this is due to periodic stress and uncontrolled leakage of arterial blood into the veins.

And now the most important thing. Is it possible to promptly replenish the lack of arterial blood?

Apparently, you can! Either by periodic transfusion of blood from veins into arteries (currently this is a very complex medical procedure), or by forcibly increasing blood pumping through the small circulatory circle, i.e. through the lungs! This is what various breathing practices, singing, laughing and "playing the flute" contribute to! After all, singing, laughing and "playing the flute" can also be attributed to breathing exercises. Using these practices every day, atherosclerosis should slow down its progress, which means that life expectancy should increase.

The record 90-year life expectancy of British Prime Minister Winston Churchill, although his father lived only 46 years, also confirms the ideas of the New theory of atherosclerosis.

After all, W. Churchill, which is very important, worked a lot and enthusiastically (mentally), was rich, family, strong-willed, was not particularly nervous, did not react to stress (according to colleagues), took warm or hot baths almost every day (!), slept twice (!) a day (2 hours in the afternoon and 5 hours at night), fell asleep instantly (!), preferred to work not sitting at the table, but lying (!) in a special bed, preferred the sitting position (!), therefore atherosclerosis developed very slowly. In the "standing" position in middle and old age, the Prime Minister was very rarely. This is probably why W. Churchill lived a long and happy life. But not everyone can like this lifestyle.

What else needs to be shown and proved about the possible cause of atherosclerosis? Every reader familiar with the school physics course, in my opinion, should not have any questions after reading the article. But doctors, physiologists, biochemists - they all focus on human genetic disorders, excessive consumption of fatty foods, the effects of diabetes, etc. After reading this article, it becomes annoying to them that for 200 years they have not found the true cause of atherosclerosis, although they were very close to the goal.

Conclusion.

Everything related to atherosclerosis has already been proven by the lives of many generations of people in different countries. There are large statistics of all observed processes.

To prove the correctness of the cause and mechanism of atherosclerosis, it was only necessary to delve into the physical processes occurring in the walls of the arteries during stress, to link the already available data, already having medical observations from different sources, from different eras. But the proud modern official medicine did not do this, and for a long period it could not find the causes of atherosclerosis.

Meanwhile, any movement of medicine towards the real prevention and treatment of atherosclerosis may begin not with the publication of this article by an outsider, but with the appropriate decision of the leaders of medicine. And this means that in many, many years, because they have a lot of their own ideas.

From the author. If desired, rigorous experimental evidence of the causes and mechanisms of atherosclerosis can be obtained on animals that must be forcibly held in an upright position with the inability to move freely for several (up to 3) months. Place the animals, for example, in a vertical pipe with a smooth surface. Of course, 2-3 times a day for 5-10 minutes it is necessary to give them the opportunity to walk, eat and drink water. Such a life, similar to the life of a modern person, according to the author, will lead to increased arterial stiffness, atherosclerosis in animals.

Conflicts of interest:

There are no conflicts of interest, because the author is one, Vladimir Ivanovich Ermoshkin.

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