



## **RISK FACTORS FOR CARDIOVASCULAR DISEASES**

*Klara Xudjayarovna Avilova*

Senior Teacher Tashkent Medical Academy Tashkent, Uzbekistan

*Abdullajonova Muslimakhon*

Student in Tashkent Medical Academy

**ABSTRACT:** *The main purpose of this article is to highlight the role of risk factors for cardiovascular disease in the development of the disease. Thanks to the article, all doctors can learn in detail about risk factors and eliminate or prevent risk factors for cardiovascular diseases.*

**Keywords:** *cardiovascular disease, risk factor, diabetes mellitus, arterial hypertension, atherosclerosis*

### **INTRODUCTION**

Cardiovascular disease is the most common cause of death in industrialized countries. These include: coronary heart disease (angina pectoris, myocardial infarction, sudden death), cerebrovascular disease (transient ischemic attack and stroke), and peripheral arterial disease (intermittent claudication and gangrene of the extremities). The most significant forms of cardiovascular pathology in terms of morbidity and mortality are coronary heart disease and stroke, since more than 70% of all deaths of cardiovascular origin are associated with them. Coronary heart disease and stroke are now the leading causes of death and disability worldwide. That is why the fight against cardiovascular diseases and their causes is the main task of cardiology in the XXI century. A decisive influence on the prognosis of cardiovascular morbidity and mortality can be exerted not only by the introduction into the practice of modern medicine of highly effective technologies, therapeutic methods and new medications for the treatment of cardiovascular diseases, but, above all, preventive measures in the form of both primary and secondary prevention aimed at eliminating the direct causes of pathological processes in the arteries.

As you know, atherosclerosis and atherothrombosis are the morphological substrates of coronary heart disease and other cardiovascular diseases. Modern ideas about the pathophysiology of atherosclerosis have led to the understanding of the dominant role of a number of factors in the formation of the atherosclerotic process in the arteries and the occurrence of atherothrombosis. The concept of risk factors for cardiovascular diseases is formulated, which, on the one hand, is based on the data of fundamental studies of atherosclerosis as a pathogenic condition, and on the other hand, is not a consequence of conclusions based on the results of prospective population studies, primarily Framingham in the 60s of the last century. , and some others, most notably the MRFIT study. It was the data of these studies that showed that the presence of certain biochemical or physiological characteristics in certain representatives of the population, as well as the peculiarities of the way of life, heredity, etc. allow to determine their risk of cardiovascular diseases, long-term prognosis of not only cardiovascular morbidity, but also mortality. Today it is doubtful that the elimination of risk factors plays an essential role in both



primary and secondary prevention of diseases of the cardiovascular system.

## MAIN PART

**What are the risk factors?** From an epidemiological point of view, this is a characteristic of a person or a population during good periods of life, associated with an increased risk of disease in the future. Thus, the risk factors for cardiovascular diseases include conditions in the presence of which the likelihood of atherosclerotic disease increases in any of its manifestations in the long term. These can be lifestyle features (eating food rich in saturated fats; smoking; drinking alcohol; low physical activity), biochemical and physiological parameters (high blood pressure; dyslipidemia; hyperglycemia and diabetes mellitus; obesity; thrombogenic factors) and individual characteristics (age; gender; family and individual history).

Risk factors are usually classified into modifiable and non-modifiable.

Risk factors for cardiovascular disease:

- Modifiable:
  - High blood pressure
  - Smoking
  - Dyslipidemia
  - Diabetes mellitus
  - Obesity
  - Dietary factors
  - Low physical activity
  - Thrombogenic factors
  - Excessive alcohol consumption
- Unmodifiable
  - Individual history of CVD
  - Family history of CVD
  - Age
  - Sex

This division is based on the notion that modifiable risk factors, such as smoking, can be eliminated or influenced and are the target of preventive interventions. As for non-modifiable risk factors, such as age or gender, their influence cannot be excluded, but they can and should be taken into account to identify groups with an increased risk of cardiovascular diseases.

The significance of many risk factors, such as arterial hypertension, dyslipidemia, smoking, diabetes mellitus, etc., for determining the prognosis of cardiovascular morbidity and mortality is now well known and confirmed by the data of numerous prospective studies in large population groups. It is known that three main factors –dyslipidemia, smoking and arterial hypertension–or a combination of them are responsible for more than 75% of cardiovascular diseases worldwide. The significance of other risk factors is being clarified, and our understanding of them is gradually expanding. Thus, in recent years, the relationship of various biochemical disorders and physiological characteristics with an increased risk of cardiovascular diseases has been actively studied. New risk factors appear, such as homocysteine, C-reactive protein, lipoprotein, etc. Therefore, at present there is no fully refined and final "list" of risk factors for cardiovascular diseases, although their main representatives are already known. It should also be remembered that these factors are often present in humans in certain combinations. It is well known that the risk of various manifestations of atherosclerotic disease, such as coronary heart disease, myocardial infarction, stroke, peripheral arterial disease, increases exponentially in any



individual in the presence of two risk factors.

### **Non-modifiable risk factors**

**Family and individual history:** A family history of myocardial infarction and cerebral stroke is one of the most important and determining risk factors for cardiovascular disease. The National Cholesterol Education Program defines a family history of preterm coronary heart disease as a definite myocardial infarction or sudden death before the age of 55 in the father or other first-line male relative (brother, son) or in the mother, and another first-line relative (sister, daughter) under the age of 65. The presence of cardiovascular disease in an individual dramatically increases the risk of cardiovascular morbidity and mortality. So, in patients who have had myocardial infarction, the risk of re-infarction is 5-7 times higher and the risk of stroke is 3-4 times higher, and in patients with atherosclerosis of peripheral arteries, the risk of heart attack is 2-3 times higher. Therefore, all patients with cardiovascular disease are at very high risk.

**Age and gender.** The risk of cardiovascular disease increases almost linearly with age. Older patients after myocardial infarction have a higher subsequent risk of death than younger patients, and the influence of age prevails over all other risk factors. In men, this risk is greater than in women, almost up to the age of 75, when the frequency of cardiovascular diseases levels off. Up to 55 years of age, their frequency among men is 3-4 times higher than among women. After the age of 55, the rate of increase in cases of coronary heart disease and other cardiovascular diseases decreases in men and increases in women. Compared to men, coronary heart disease occurs an average of 10 years later in women.

### **Modifiable risk factors**

**Smoking** is one of the most important modifiable risk factors for cardiovascular disease. It is believed that smoking is the main cause of death that can be reversed. Numerous prospective studies have shown that smoking increases the risk of cardiovascular disease. So, compared with non-smokers, those who smoke 20 cigarettes a day have a 2-3 times higher risk of coronary heart disease. Smokers have an increased risk not only of coronary disease and myocardial infarction, but also of sudden death, ischemic stroke, aortic aneurysm and peripheral arterial disease, i.e., all atherosclerotic diseases. Moreover, the risk, of course, depends on the number of cigarettes. Smoking cessation increases the likelihood of survival, mortality in quitters 3 years after smoking cessation reaches that of non-smokers.

**Excessive alcohol consumption** has a negative effect on the cardiovascular system and other organs and systems. In persons who abuse alcohol, blood pressure rises, there is a predisposition to electrical instability of the myocardium with a proarrhythmic effect, damage to the kidneys, liver, nervous system, the nature of nutrition changes, which leads to a deficiency of B vitamins. Alcohol affects mental and social status. Excessive alcohol consumption leads to an increase in overall and cardiovascular mortality, especially from stroke.

**The nature of nutrition** has a significant impact on the risk of cardiovascular disease. Basically, the nature of nutrition contributes to the development of atherosclerosis and cardiovascular diseases through the impact on other risk factors: obesity, hypertension, studies have shown that eating foods rich in saturated fats and cholesterol, dyslipidemia. Some are associated with an increased risk of cardiovascular morbidity and mortality. A low-fat, low-cholesterol diet has been shown to reduce the risk of recurrent myocardial infarction by 37% over 5 years and myocardial mortality over 11 years of follow-up by 44%. WHO recommends optimal intake levels for various dietary components that can be used in various preventive regimens .



**Sedentary lifestyle and low physical activity.** Physical inactivity is one of the most common modifiable risk factors for cardiovascular disease. Elderly patients, who already constitute the highest risk group for cardiovascular disease, tend to lead a sedentary lifestyle. According to prospective epidemiological studies, a sedentary lifestyle is associated with an increased risk of death from all causes, an increased risk of cardiovascular diseases, including coronary heart disease. The study showed that in people with a sedentary lifestyle, this risk is 2 times higher than in physically active people. Even modest lifestyle changes with moderate exercise in middle and old age significantly improve the prognosis for both cardiovascular and overall mortality. The current recommended minimum physical activity is 30 minutes of moderate-intensity exercise daily, averaging 150 minutes per week.

**Arterial hypertension** is one of the most important risk factors, and its presence in various age groups largely determines cardiovascular morbidity and mortality. The prevalence of arterial hypertension reaches 40% in the population; 9-24% - among adolescents and young people and 75% - among the elderly. Currently, the optimal pressure is considered to be BP < 120/80 mm Hg. Art., blood pressure < 130/85 mm Hg. Art., high normal blood pressure 130-139 / 85-89 mm Hg. Art., and arterial hypertension BP > 140/90 mm Hg. Art. The risk of cardiovascular disease associated with hypertension is undeniable and confirmed by numerous epidemiological studies. Arterial hypertension leads to damage to target organs (myocardial hypertrophy of the left ventricle, microalbuminuria, thickening of the intima complex of various arteries, impaired renal function), the occurrence of diseases such as coronary heart disease, myocardial infarction, stroke, etc. In general, the higher the blood pressure, the higher the cardiovascular vascular risk. An increase in both diastolic and systolic pressure is important. However, according to recent data, an increase in systolic BP is associated with a higher risk of cardiovascular morbidity and mortality than diastolic. Not only systolic and diastolic blood pressure is associated with a high risk of cardiovascular complications, the relationship of cardiovascular disease with pulse blood pressure is no less significant. The role of hypertension is especially significant in the elderly. According to numerous studies, antihypertensive therapy in elderly patients under the age of 80 can significantly reduce the incidence of coronary heart disease, stroke and other atherosclerotic diseases, and the presence of isolated systolic hypertension, especially characteristic of the elderly, is associated with the highest risk of cardiovascular disease. events, both lethal and non-lethal. There is no doubt that the main goal of BP control is to reduce the risk of cardiovascular morbidity and mortality as much as possible. It is recognized that lowering blood pressure in itself has a beneficial effect on prognosis. So a decrease in diastolic blood pressure by 5-6 mm Hg. reduces the risk of stroke by 42% and the risk of cardiovascular events by 15%. Measures to reduce blood pressure should not include non-pharmacological methods and antihypertensive drug therapy.

**Dyslipidemia.** Genetic, morphological and epidemiological studies have shown the primary role of lipids and lipoproteins in atherosclerotic lesions of the arteries and related cardiovascular diseases. Undoubtedly, both primary and secondary prevention of these diseases is impossible without correction of dyslipidemia. To date, there are convincing data from numerous studies on an unconditional improvement in prognosis and a decrease in cardiovascular risk in people who received lipid-lowering therapy, especially statins, in which their lipid profile returned to normal.

**Overweight, obesity and metabolic syndrome.** Currently, in industrialized countries there is a real "epidemic of obesity": it is observed in 30% of the adult population, and overweight in 50-70%. Obesity can be considered one of the most important modifiable risk factors. On the one hand, obesity is a consequence of the modern lifestyle with fatty foods and low physical activity. On the other hand, obesity often occurs with genetic defects in the obese gene system, which is



responsible for the production of the leptin protein, which regulates hunger, satiety, and the amount of adipose tissue in the body. Prospective epidemiological studies have shown that obesity is an independent risk factor for cardiovascular disease and mortality. According to the Framingham Study, cardiovascular morbidity and mortality increase with weight in both men and women, and the risk of cardiovascular events begins to increase already at body weight at the upper limit of normal and progressively increases as it increases. It is also important that obesity increases the risk of not only cardiovascular diseases, but also type 2 diabetes mellitus several times. Obesity itself predisposes to hyperlipidemia, diabetes mellitus, and arterial hypertension, so overweight individuals tend to have several risk factors and a particularly poor prognosis.

**Diabetes.** In industrialized countries, diabetes mellitus occurs in 10-12% of people in the population, 90% of it is type 2 diabetes. Worldwide, more than 150 million people suffer from type 2 diabetes, and this number is growing every year, which is associated with increased consumption fatty foods, the prevalence of obesity, sedentary lifestyles, increased life expectancy and an aging population. Patients with diabetes have a manifold increased risk of all diseases associated with atherosclerosis, including coronary heart disease, stroke, and peripheral arterial disease, compared with those without diabetes. Cardiovascular risk in diabetes is partly due to the direct effects of hyperglycemia, and partly due to the frequent association of diabetes with other risk factors for cardiovascular disease. Arterial hypertension and obesity are very common in diabetes. Typical for diabetes and lipid metabolism disorders such as increased levels of total cholesterol, triglycerides, low-density lipoproteins in serum, decreased levels of high-density lipoproteins. Microalbuminuria, characteristic of diabetes, is not only a marker of diabetic nephropathy, but an independent factor that increases the risk of cardiovascular morbidity and mortality. Even in the initial stage and in pre-diabetic situations, the presence of impaired glucose tolerance, abdominal obesity, hyperinsulinemia, reflecting insulin resistance, leads to a dramatic increase in the risk of cardiovascular morbidity and mortality. The absolute and relative risk of death from cardiovascular disease in men with diabetes is 3 times greater than in men without diabetes. Prevention of cardiovascular diseases in diabetes should include measures not only to reduce the level of glycemia, but also to actively eliminate all risk factors for cardiovascular diseases (obesity, dyslipidemia). The importance of this approach in patients with diabetes has been confirmed in studies: tight control of blood pressure in its effect on cardiovascular morbidity and mortality is superior to the results of tight control of blood glucose.

## CONCLUSION

To reduce cardiovascular disease, public health and healthcare providers should focus on preventable cardiovascular risk factors and develop recommendations and strategies. Strategies and efforts are currently being undertaken at the local and national levels to reduce the burden of cardiovascular diseases. This includes Life's Simple 7 (quit smoking, eat better, lead an active lifestyle, lose weight, control blood pressure, control cholesterol and lower blood sugar), which have not achieved much success. Overall, studies have identified hypertension as a leading cardiovascular risk factor, which requires a more thorough examination of our current clinical practice, research, and policy to reduce prevalence statewide and nationally. The long-term benefits of exposure to modifiable risk factors for cardiovascular diseases, such as hypertension, before the deterioration of heart health can be of great importance, including improving the quality of life, as well as reducing the economic burden on the health system. With regard to preventable risk factors, prevention should be a priority at the local, national and global levels.





## REFERENCES

1. World Health Organization. WHO| Cardiovascular diseases (CVDs). Geneva: World Health Organization; 2022. [http://www.who.int/cardiovascular\\_diseases/en/](http://www.who.int/cardiovascular_diseases/en/)
2. CDC. Know your risk for heart disease. 2019. [https://www.cdc.gov/heartdisease/risk\\_factors.htm](https://www.cdc.gov/heartdisease/risk_factors.htm)
3. NHS. Cardiovascular disease.2021. <https://www.nhs.uk/conditions/cardiovascular-disease/>
4. Sazlina SG, Sooryanarayana R, Ho BK, Omar M.A, Krishnapillai AD, MohdTohit N Cardiovascular disease risk factors among older people: Data from the National Health and Morbidity Survey 2015. PLoS ONE2020. 15(10).<https://doi.org/10.1371/journal.pone.0240826>
5. Mancia G. The association of hypertension and diabetes: prevalence, cardiovascular risk and protection by blood pressure reduction. ActaDiabetol. 2005.
6. Rodondi N, Locatelli I, Aujesky D, Butler J, Vittinghoff E, Simonsick E. Framingham Risk Score and Alternatives for Prediction of Coronary Heart Disease in Older Adults. PLoS One 2012.16(7). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3314613/>
7. Joshi R, Taksande B, Kalantri SP, Jajoo UN, Gupta R. Prevalence of cardiovascular risk factors among rural population of elderly in Wardha district. Journal of Cardiovascular Disease Research. 2013. <https://doi.org/10.1016/j.jcdr.2013.03.002>
8. Loria CM, Liu K, Lewis CE. Early adult risk factor levels and subsequent coronary artery calcification: The CARDIA study. J Am CollCardiol. 2007. <https://pubmed.ncbi.nlm.nih.gov/17512357/>