

## PROBLEM LECTURE

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# PREVENTIVE CARDIOLOGY, PRECLINICAL DIAGNOSES: OLD PROBLEMS – NEW APPROACHES

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**Abstract:** The article discusses the new Guidelines on cardiovascular disease prevention in clinical practice (2016) which summarized novel approaches of detection of such risk factors as overweight, obesity, abdominal obesity, smoking, dyslipidemia (cholesterolemia, triglyceridemia), blood pressure (BP) levels, glucose, insulin, insulin resistance, inflammatory markers, such as c-reactive protein, which can be widely used in practice.

**KeyWords:** Cardiovascular disease, preventive cardiology, risk assessment and stratification, strategy for prevention of cardiovascular diseases.



Cardiovascular diseases (CVD) are the leading cause of morbidity and mortality all over the world. The current strategy for their prevention and treatment considers the pathophysiological mechanisms of the impact of risk factors, as their early detection and correction can result in a significant improvement of cardiovascular prosthesis [1].

Therefore, it is very important to find out early markers of cardiometabolic disorders which can help to identify persons with risk of obesity, type 2 diabetes mellitus (DM2T) on preclinical level. Prevention of CVD is one of the highest priorities, because two thirds of the risk factors are caused by the way of life, which includes a variety of psychosocial stressful life events, chronic stress at work, lack of social support, low socio-economic status, tensions of family relationships, and so on.

In 1994 the European Society of Cardiologists developed and published the guidelines for the prevention of ischemic heart disease in clinical practice [2]. In 1998, the Joint Expert Group published their review, proposing the requirements to the way of life, highlighting the influence of risk factors and identifying therapeutic target points for prevention.

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The second edition, which was supplemented and approved by the European Society of General Practice and the International Society of Preventive Medicine, provided a lot of new data that became the basis for their next revision [3]. In 2007 (updated by the European Stroke Organization) lifestyle counseling received much attention, and the approach to the assessment of cardiovascular risk using a scale of relative risk was changed [4].

In April 2016 European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice published Guidelines on cardiovascular disease prevention in clinical practice. These Guidelines summarized novel approaches concerning the detection of such risk factors as overweight, obesity, abdominal obesity, smoking, dyslipidemia (cholesterolemia, triglyceridemia), blood pressure (BP) levels, glucose, insulin, insulin resistance, inflammatory markers, such as c-reactive protein, which can be widely used in practice [5].

The new Guidelines stipulate that the level of CVD mortality can be decreased by half due to a rather moderate reduction of risk factors. CVD prevention is defined as a coordinated set of actions, at the population level or targeted at an individual, that are aimed at eliminating or minimizing the impact of CVDs and related disabilities [5]. The new Guidelines on cardiovascular disease prevention in clinical practice recommends to assess total CVD risk in an individual along with prevention of CVD: the higher the risk, the more intense the action should be.

The updated recommendations consider risk assessment and stratification to be an important prerequisite for successful CVD prevention. Individuals with low risk are recommended to maintain proper lifestyle as long as possible (ideally during lifetime); those with increased risk need correction, and the higher the risk is, the more correction they need, and the higher the original risk is, the more benefit they will have from correction measures.

The increase in the number of CVD promotes the relevance of programs for their prevention, control and monitoring of risk factors distribution. According to the WHO the strategy for prevention of diseases can be developed for masses (measures at the level of legislation, lifestyle changes), and for people with high risk (aimed at groups of people with a high risk of certain diseases) [6]. The combination of these strategies is supposed to be optimal.

Primary prevention includes a range of medical and nonmedical interventions aimed at prevention of deviations in health condition and diseases common to the entire population of selected regional, social, age, professional and other groups. Secondary prevention involves a complex of medical, social, hygienic, psychological and other measures aimed at early detection and prevention of exacerbations, complications, and chronicity of illnesses, and disabilities that cause maladjustment of patients in society, as well as reduced abilities, including incapacitation and untimely death.

Patients with CVD have a high risk of developing cardiovascular complications. They require more intensive changes of lifestyle and, if necessary, prescription of drug therapy. Relatively healthy "asymptomatic" patients need preventive measures in accordance with their level of risk. There have been proposed various models to determine the risk of CVD development in "asymptomatic" patients, which use multivariate analysis of different combinations of risk factors in populations. In particular, in Western European populations the prevalence of coronary heart disease among working population is lower in comparison with Eastern Europe, and mortality from fatal cases is two times lower. It is quite obvious that campaign against hypertension is not only necessary, but also possible. These

trends in developed countries are due to preventive health care and, in particular, development of "Recommendations for prevention of cardiovascular diseases in clinical practice."

Clinicians should assess the general risk of CVD to intensify the preventive measures such as introduction of diet recommendations, individualization of extension of physical activity, and, if necessary, prescription of drug therapy with the use of drug doses or their combinations, ensuring control of risk factors. Recommendations should not be based on the analysis of any of the risk factors separately. To determine relative personal risk, the obtained results are compared with the parameters of non-smokers of the same age and sex, with AD less than 140/90 mmHg and cholesterol level below 5 mmol/l (190 mg/dl).

Consequently, to maintain low risk or to decrease it, patients must stick to the following guidelines:

- 1) complete refusal from smoking;
- 2) healthy diet;
- 3) sufficient physical activity;
- 4) body mass index <25 kg/m<sup>2</sup>, absence of central obesity;
- 5) blood pressure <140/90 mm Hg;
- 6) the level of cholesterol <5 mmol/l (190 mg/dl);
- 7) low-density lipoprotein cholesterol (LDLC) < 3 mmol/l (115 mg/dl);
- 8) concentration of blood glucose <6 mmol/l (110 mg/dl).

At the same time, people at high risk of cardiovascular diseases are recommended to control a number of parameters:

- 1) BP <130/80 mm Hg, if possible;
- 2) Total cholesterol <4.5 mmol/l (175 mg/dl); if possible - <4 mmol/l (155 mg/dl);
- 3) LDL cholesterol <2.5 mmol/l (100 mg/DL); if possible, <2 mmol/l (80 mg/DL);
- 4) Blood glucose <6 mmol/l (mg/DL) and HbA1c <6.5 percent, if possible.

Thus, a strategy for individuals at high risk must be complemented by public health measures to encourage a healthy lifestyle and to reduce population levels of CV risk factors.

Smoking cessation strategy includes 5A [5]:

- 1A - ask: systematic identification of smokers;
- 2A - assess: assessment of readiness to stop smoking;
- 3A - advise: convincing advice to stop smoking;
- 4A - assist: recommendation of nicotine replacement therapy;
- 5A - arrange: organization of schedule of visits.

The strategy of making healthy food choices. Healthy diet is an integral part of the control of risk factors. Each case requires professional advice on the choice of the diet, which minimizes the risk of CVD, promotes the normalization of weight, blood pressure, lipid metabolism, controls blood glucose levels, reduces the risk of thrombosis.

The strategy of physical activity increase. Physical activity should be promoted in all age groups, both among adults and children. A special attention should be paid to the risk group in which increased physical activity should lead to a reduction in the risk of CVD. The goal to strive for is physical activity for at least half an hour daily, although more moderate activity is also useful.

The strategy against overweight and obesity. Prevention of excess weight gain or reduction is important for patients with CVD, and for those who have a high risk of CVD. Weight reduction is highly indicated to obese patients (body mass index (BMI) more than 30 kg/m<sup>2</sup>), overweight patients (BMI - 25-30 kg/m<sup>2</sup>), and those with abdominal type of obesity (waist circumference more than 102 cm in men and 88 cm in women). Success in weight reduction is supposed to be more appreciable if it is supported by professional physicians, on the one hand, and presence of motivation in patients, on the other.

The strategy of lipid content control in blood plasma. In general, the level of cholesterol in blood plasma should not exceed 5 mmol/l (190 mg/dl), and LDLC - 3 mmol/l (115 mg/dl). For patients with clinically determined CVD and for people with diabetes the target levels of cholesterol should be below 4.5 mmol/l (175 mg/dl) and LDL cholesterol - below 2.5 mmol/l (100 mg/dl).

The strategy of achieving the optimal level of blood pressure. The risk of developing CVD is continuously growing with the increase in blood pressure, once it exceeded

the normal range. The decision to start therapy depends not only on the BP level but also on the degree of total cardiovascular risk and presence or absence of target organ damage. In patients with determined CVD, the choice of antihypertensive therapy depends on the underlying cardiovascular pathology. Drug therapy should be immediately initiated in patients with systolic BP 180 mm Hg or diastolic blood pressure 110 mm Hg and above regardless of their total cardiovascular risk.

Behavior risk factors. The lifestyle change is required for the majority of patients with determined CVD and high risk of its development.

The need for prevention of CVD in Ukraine is specified in the documents and regulations, but it is rather declarative. The successful implementation of CVD prevention guidelines relies heavily on general practitioners providing risk factor evaluation, intervention and patient education.

#### CONFLICT OF INTERESTS

There is no conflict of interests.

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