UPDATES IN CARDIOLOGY

Cardiovascular prevention and rehabilitation - what is new?

Dana Pop[1], Dumitru Zdrenghea[1], Gabriel Cismaru[1], Gabriel Gusetu[1], Radu Rosu[1], Emilia Babes[2], Mircea Ioachim Popescu[2]

At present despite the decreases in cardiovascular disease mortality (due to coronary artery disease in general, strokes and other cardiovascular diseases) cardiovascular disease remains the most common cause of death in Europe[1]. So, the prevalence of deaths from cardiovascular disease is 40% in men and 49% in women[1]. A good thing is that Romania passed from the category of very high to high cardiovascular risk country[2].

The most important achievement of the last year in the domain of prevention is the publication of the EUROPEAN GUIDELINES ON CARDIOVASCULAR DISEASE PREVENTION[2]. From the beginning, in this guideline, is outlined that a population-based strategy plays a „key" role in cardiovascular disease prevention. This strategy is cost effective. A reduction with 10% of cholesterol levels, blood pressure and smoking in the entire population would save approximatively three times more lives than statin therapy, three different antihypertensive drugs (each at half of the standard dose) and aspirin in 40% of patients with high cardiovascular risk. Also, there is a paradigm regarding prevention: „small shifts in the risk of disease across a whole population consistently lead to a greater reduction in disease burden than a large shift in high risk individuals only".

Key messages from the 2016 European guidelines on cardiovascular disease prevention in clinical practice can be summarized as follows[2,3]:

- Prevention of cardiovascular diseases, either by implementation of lifestyle changes or use of medication, is cost effective, including high-risk individuals. Cost-effectiveness depends on several factors, including baseline cardiovascular risk, cost of drugs or other interventions, reimbursement procedures and implementation of preventive strategies.
- Although the presence of genetic factors is associated with an increased risk of cardiovascular disease, the guideline does not recommend their routine use in clinical practice.
- A healthy diet is recommended as a cornerstone of cardiovascular disease prevention not only in patients with cardiovascular disease but in all individuals regardless of their cardiovascular risk.
- Ideal weight represented by a with a body mass index of 20–25 kg/m^2 (in those under 60 years of age), is associated with lowest risk of death from any cause. Both overweight and obesity are associated with hypertension, diabetes and an increased cardiovascular risk.
- There are several evidences that regular physical activity decreases all-cause and cardiovascular mortality. It is recommended for healthy adults of all ages to perform regular physical activity: at least 150 minutes/week of moderate intensity or 75 minutes/week of vigorous intensity physical activity or an equivalent combination thereof. Any activity is better than none and more activity is better than some.
- Stopping smoking is the most cost-effective strategy for cardiovascular disease prevention.
- There is evidence of a positive relationship between obstructive sleep apnoea syndrome and hypertension, coronary artery disease, atrial fibrillation, stroke, and heart failure.
- Erectile dysfunction is associated with future cardiovascular events in men without and with established cardiovascular disease.

[1] Department of Cardiology-Rehabilitation, „Iuliu Hatieganu" University of Medicine and Pharmacy, Cluj-Napoca, Romania
[2] Department of Cardiology Faculty of Medicine and Pharmacy, Oradea, Romania

Contact address:
Prof. Dana Pop, MD
Department of Cardiology-Rehabilitation, „Iuliu Hatieganu" University of Medicine and Pharmacy, Cluj-Napoca, Romania.

- Pre-eclampsia and pregnancy-related hypertension, are associated with a higher risk of cardiovascular disease later in life. Polycystic ovary syndrome confers a significant risk for future development of diabetes mellitus.
- Cardiovascular risk varies considerably between immigrant groups. South Asians and sub-Saharan Africans have a higher risk, while Chinese and South Americans have a lower risk. South Asians are characterized by a high prevalence and inadequate management of diabetes mellitus. Current risk estimation equations do not provide adequate estimations of cardiovascular risk in ethnic minorities.
- It is very important the assessment and correct management of psychosocial risk factors, respectively of familial and work stress, of depression, anxiety that can contribute to reduction of cardiovascular risk.
- The decision to start blood pressure-lowering treatment depends on the blood pressure level and total cardiovascular risk. Benefits of treatment are mainly driven by blood pressure reduction *per se,* not by drug type. Combination treatment is needed to control blood pressure in most patients. Elevated blood pressure is a major risk factor for coronary artery disease, heart failure, cerebrovascular disease, peripheral artery disease, chronic kidney disease and atrial fibrillation.
- Adherence to medication in individuals at high risk and in patients with cardiovascular disease is low. Several types of interventions are effective in improving medication adherence. The polypill may increase adherence to treatment and improve cardiovascular risk factor control.
- It is important periodic evaluation of major cardiovascular diseases: coronary artery disease, atrial fibrillation, heart failure, peripheral artery disease, cerebrovascular disease.
- Healthy environments will stimulate a healthy lifestyle.
- Secondary prevention must be accomplished through the following measures: systematic evaluation of population at high cardiovascular risk, estimation of cardiovascular risk should be standardised and repeated at every 5 years, promoting physical activity from childhood and cardiac rehabilitation programmes after acute coronary syndromes, revascularization and in heart failure.
- It is recommended the use of new „locations" for implementation of preventive measures: at home, home-based rehabilitation with and without telemonitoring.
- It is outlined that governmental and non-governmental organizations such as heart foundations and other health-promoting organizations can be a powerful force in promoting a healthy lifestyle and healthy environments in cardiovascular disease prevention.

Important achievements of the last year are from the domain of atherosclerosis, dyslipidaemias, diabetes mellitus and hypertension[4].

Important successes were obtained using hybrid imagistic methods for detection of subclinical atherosclerosis in the carotid, aortic, coronary and ilio-femoral territories in asymptomatic middle-aged individuals with low, moderate and high risk. This is very important for implementation of early therapy in this group of patients (*PESA study-Progression of Early Subclinical Atherosclerosis*)[5]. At the same time using high resolution intracoronary imagistic methods (*optical coherence tomography*-OCT) showed that in a great number of patients with acute coronary syndromes the coronary event is caused by atheromatous plaque erosion even if the fibrous cap of the atheromatous plaque is intact[6].

Regarding the updates in dyslipidaemia treatment, therapeutic strategies have been developed mainly using monoclonal antibodies of proproteinconvertase-subtilisin/kexin type 9 (PCSK9). Monoclonal antibodies of proproteinconvertasesubtilisin/kexin type 9 (evolocumab and alirocumab) are recommended in guidelines since they proved their efficiency in reduction of LDL-cholesterol levels. Both the ACC consensus on role of non-statin therapies in population with atherosclerotic cardiovascular disease risk and European guidelines for dyslipidaemia management recommend these new class of drug in all patients with very high cardiovascular risk or with cardiovascular disease, but also in patients with familial hypercholesterolemia if goals of therapy have not been achieved on maximally tolerated statin and ezetimibe. PCSK9 inhibitors are recommended for LDL cholesterol reduction also in patients with statin intolerance[8].

The progresses in the area of diabetes results from the trial EMPA-REG OUTCOME. In this trial patients with type 2 diabetes at high risk for cardiovascular events who received empagliflozin a selective inhibitor of SGLAT-2, as compared with placebo, had a lower

rate of the primary composite cardiovascular outcome and of death from any cause[9].

The results of SPRINT[10] and ACCORD[4] trials raised many questions regarding the therapeutic goals in hypertension that must be recommended in the future guidelines. The SPRINT trial in USA showed that in hypertensive patients with high cardiovascular risk, but without diabetes, reduction of blood pressure below 120/80 mmHg is associated with significant reduction of major fatal and nonfatal cardiovascular events and all cause of death, in comparison with hypertensive patients with blood pressure reduction below 140/90 mmHg as recommended actually in guidelines[4,10]. The same was observed in diabetic patients in ACCORD trial[4].

In PATHWAY-2 and PATHWAY-3 trials adding spironolactone in the treatment of hypertension resistant to treatment, respectively of amiloride in combination with hydrochlorothiazide contribute to supplementary reduction of blood pressure[11,12].

In conclusion, given that cardiovascular diseases continue to represent a real problem in Europe causing a large number of deaths, in present it is demonstrated that cardiovascular prevention represent a cost-effective method for promoting a healthy life style, but also for the reduction of the incidence of cardiovascular disease.

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