SUPPLEMENT

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NUTRITION AND CARDIOVASCULAR RISK

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Current state of knowledge

Nutrition is a biological and involuntary process based on the intake of food in response to the body's needs for nutrients. On the other hand, alimentation can be defined as a social and voluntary phenomenon that includes a set of choices such as product selection and preparation. Nutrition is a consequence of alimentation, meaning it depends on the foods that make up the diet and their proportions.

Feeding is the process of ingesting foods that provide nutrients to the body to meet its basic needs. It is considered adequate and healthy when it is sufficient, complete, and varied in its nutrient composition, suitable for different stages and situations that individuals go through and adapted to each person's needs and energy expenditure. This is what is referred to as the laws of alimentation.

According to the Pan American Health Organization, cardiovascular diseases (CVD) continue to be the main cause of mortality and a significant burden of disease and disability at a socio-health and economic level in the Americas. In the world it represents 31% of all registered deaths. More than three quarters of CVD deaths occur in low- and middle-income countries.

Most CVD can be prevented by addressing behavioral risk factors such as tobacco consumption, inadequate diets, obesity, physical inactivity, or alcohol consumption, using strategies that cover the entire population[1].

For individuals with CVD or high cardiovascular risk (CVR) (due to the presence of one or more risk factors such as hypertension, diabetes, hyperlipidemia), early detection and early treatment are crucial[2].

Prevention is considered a set of coordinated actions aimed at the general population or individually to eliminate or minimize the impact of CVD and the associated disabilities. Adequate lifestyle changes, appropriate nutrition, and physical activity, as well as pharmacological treatment, reduce cardiovascular events and increase the life expectancy of patients[3].

Appropriate lifestyle changes significantly reduce cardiovascular risk factors, mainly associated with prediabetes and type 2 diabetes mellitus. There is significant evidence that plant-based dietary patterns, low in saturated fats, cholesterol, and sodium, with high fiber, potassium, and unsaturated fatty acid content, are beneficial and reduce the expression of cardiovascular risk factors. Notable examples in this context include the Mediterranean diet, the Dietary Approaches to Stop Hypertension (DASH) diet, low-carbohydrate diets, and vegan-vegetarian diets. Additionally, in the relationship between nutrition and metabolic diseases, efforts should focus on preventing weight gain or reducing excess weight in cases of overweight or obesity and individualize treatment to promote the patient's quality and life expectancy[4].

A healthy eating pattern and an appropriate calorie intake level help obtain the necessary nutrition to achieve and maintain a healthy weight, as well as reduce the risk of chronic diseases. The dietary plan should encompass variety, quantity, and nutrient density, including all food groups while limiting added sugars, saturated fats, and sodium content, to meet nutritional needs and maintain appropriate calorie balance. Supporting healthy eating is a social responsibility[5].

Recommendations

Healthy recommendations should be the same for controlling any risk factor for primary and secondary prevention of CVD, based on gathered evidence regarding lifestyle changes such as diet and physical exercise[6]. Emphasis should be placed on the most important dietary patterns for cardiovascular prevention.

The concept of dietary patterns has been established in recent years as a model for the relationship between nutrition and health, serving as an educational tool for the population. This has shifted the traditional paradigm that the basic nutritional unit of the diet is not nutrients (such as fatty acids), but rather the foods containing them (oils, nuts, red meats, dairy products, etc.). These foods have diverse components capable of interacting synergistically or antagonistically on metabolic pathways crucial for cardiovascular health[6].

There is strong evidence that plant-based dietary patterns, low in saturated fats, cholesterol, and sodium, with a high content of fiber, potassium, and unsaturated fatty acids, are beneficial and reduce cardiovascular risk factors. Notable examples in this context are the mediterranean diet and the DASH diet. Data from large cohort studies, and the randomized clinical trial PREDIMED for the mediterranean diet, indicate that adherence to these dietary patterns provides a clear cardiovascular benefit[7]. In contrast, the low-fat diet is currently under scrutiny for its limited cardiovascular protective potential. Regarding edible fats, virgin olive oil is the most effective culinary fat in preventing CVD[8]. The PREDIMED study demonstrated over approximately five years that participants assigned to the mediterranean diet supplemented with extra virgin olive oil or nuts experienced an average reduction of 30% in major cardiovascular events and a reduced risk of type 2 diabetes (T2DM)[7,9].

Evidence regarding meats suggests that the consumption of white meat, lean red meat, or fish, three to four servings per week, does not increase CVR, unlike the consumption of processed meats (sausages or cold cuts) containing harmful additives such as salt and nitrates, which increases overall mortality.

Concerning dairy products, is desirable to consume at least two daily servings due to its essential role in calcium metabolism and its richness in high-quality biological proteins. Restricting whole-fat dairy products does not seem to be a suitable strategy for reducing CVR, although habitual consumption of dairy with added sugars is discouraged. For cardiovascular prevention, it is advisable to reduce the consumption of concentrated dairy fats such as butter or cream.

Current scientific evidence suggests that egg consumption is not harmful in the context of a healthy diet. Both the general healthy population and individuals with cardiovascular risk factors can consume up to one egg per day without affecting their cardiometabolic health[4].

Legumes and whole grain cereals contain multiple healthy nutrients, and their frequent consumption is associated with a reduction in CVR factors and disease. It is recommended to consume one serving of legumes at least four times per week. The recommended consumption of whole grains is four servings per day.

Regarding the consumption of fruits and vegetables, based on existing scientific evidence, four to five servings per day of a combination of fruits and vegetables are recommended as it reduces overall and cardiovascular mortality. Furthermore, the beneficial effect of fruits and vegetables is dose-dependent and is more evident in cerebrovascular disease than in coronary artery disease. The consumption of tubers like potatoes is not associated with an increase in cardiovascular disease.

Frequent consumption of nuts (equivalent to a serving of 30 g) is associated with cholesterol control, reduction on coronary disease, and overall mortality[7]. It is advisable to consume them raw and unpeeled (not roasted or salted), as most antioxidants are found in the skin.

Cocoa is a seed with abundant nutrients, and the consumption of its main derivative, chocolate, improves risk factors and is associated with a reduction in cerebrovascular accident (CVA) and T2DM, exhibiting hypocholesterolemic and antihypertensive effects, and improving insulin resistance. Thus, dark chocolate ($\geq$ 70% cocoa) without added sugar can be consumed in a healthy diet.

There are numerous functional foods aimed at reducing CVR, mainly through the reduction of cholesterol levels. The cholesterol-lowering effectiveness of plant sterols and soluble fiber preparations at the intestinal level has been widely demonstrated. Likewise, there is consistent evidence that omega-3 fatty acids at pharmacological doses decrease plasma triglycerides.

Excessive salt intake is associated with CVD and mortality from cardiometabolic causes. A low-salt diet (< 5 g/day) is recommended at the population level and is especially indicated for those diagnosed with hypertension and their relatives. An alternative to salt is using lemon juice, garlic, or aromatic herbs.

It is reasonable to think, supported by recent evidence, that there is no standard model of a healthy diet. Biological responses vary among individuals, especially due to individual differences in the genome and microbiome. In the coming years, personalized and precision nutrition, along with other sciences such as chronobiology, where each person adopts the diet that is personally most beneficial, will be a challenge for the scientific community[10]. Finally, one of the most complex issues in the relationship between individuals and their diet is adherence, which depends on various factors related to the patient, family, health team, and the healthcare system. Therefore, it is essential to implement healthcare strategies to achieve adherence[11].

References

1. WHO. WHO methods and data sources for causes of death at country level 2000-2019. Geneva: World Health Organization; 2020. In:https://www.who.int/en/news/item/09-12-2020-who-reveals-leading- causes-of-death-and-disability-worldwide-2000-2019; consulted October 2022.
2. NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in hypertension prevalence and progress in treatment and control from 1990 to 2019: a pooled analysis of 1201 population-representative studies with 104 million participants. *Lancet* 2021; 398: 957-80.
3. Martínez Moya R, Lorente Ros A, Rajjoub Al-Mahdi EA, Zamorano Gómez JL. Prevention and treatment of cardiovascular risk factors Prevention and treatment of cardiovascular risk factors *Medicine* 2021; 13: 2081-8.
4. Fuster VP, Pérez AP, Gómez JC, Pedragós AC, Gómez Huelgas R, Pérez-Martínez P. Executive summary: Updates to the dietary treatment of prediabetes and type 2 diabetes mellitus. *Clin Investig Arterioscler* 2021; 33:73-8.

5. The Healthy US-Style. Dietary Guidelines for Americans, 2015-2020 Source: United States Department of Health and Human Services, 2015. In: health.gov/sites/default/files/2019-10/DGA_Recommendations-At-A-Glance -SP.pdf; consulted October 2022.

6. Pérez-Jiménez F, Pascual V, Meco JF, et al. Document of recommendations of the SEA 2018. Lifestyle in cardiovascular prevention. *Clin Investig Arterioscler* 2018; 30:280-310.

7. Estruch R, Ros E, Salas-Salvadó J, et al. PREDIMED Study Investigators. Primary prevention of cardiovascular disease with a Mediterranean diet supplemented with extra-virgin olive oil or nuts. *N Engl J Med* 2018; 378: e34

8. López-Miranda J, Pérez-Jiménez F, Ros E, et al. Olive oil and health: summary of the II international conference on olive oil and health consensus report, Jaén and Córdoba (Spain) 2008. *Nutr Metab Cardiovasc Dis* 2010; 20: 284-94.

9. Ros E, Martínez-González MA, Estruch R, et al. Mediterranean diet and cardiovascular health: Teachings of the PREDIMED study. *Adv Nutr* 2014; 5: 330S-6S.

10. Pérez-Martínez P, Mikhailidis DP, Athyros VG, et al., Lifestyle recommendations for the prevention and management of metabolic syndrome: an international panel recommendation. *Nutr Rev* 2017; 75: 307-26.

11. Mostaza JM, Pintó X, Armario P, et al. SEA 2022 Standardsfor Global Control of Cardiovascular Risk. *Clin Investig Arterioscler* 2022; 34: 130-79.