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Nutrition and prevention of chronic-degenerative diseases

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Abstract

Over the last years, numerous evidence on the existing relationship between nutrition and chronic degenerative diseases have led investigators to search for the optimal dietary pattern to maintain a good health status. It's well known, in fact, that nutrition is capable of substantially modifying the risk profile of a subject in primary and/or secondary prevention. Several models of diet have been imposed on public attention, but the one that got the most interest is certainly the Mediterranean diet. Recently, several studies have shown that a strict adherence to a Mediterranean dietary pattern is associated with a lower incidence of mortality and incidence of chronic degenerative diseases such as cardiovascular disease and cancer. Meta-analyses conducted by our group have revealed, in a population of over than 2 million of people, that adherence to Mediterranean diet determines a significant reduction on the risk of cardiovascular and cerebrovascular accidents.

To the best of the knowledge the most effective indications for an optimal therapeutic strategy in nutrition include: increase the consumption of fruits and vegetables up to the recommended 5 servings a day, prefer whole grains, replace saturated and trans fats with unsaturated fats, reduce the consumption of sugar and sweetened beverages, and limit salt intake. With these simple indications, together with recommendations of following the principles of the traditional Mediterranean diet, a substantial reduction of the risk of incidence and / or mortality from cardiovascular disease can be easily obtained.

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1. Introduction

Nutrition is able to alter the health status of the general population. The World Health Organization, in fact, strongly emphasized the role of unhealthy eating habits, along with sedentary lifestyle and cigarette smoking as a risk factor for the onset of chronic diseases such as cardiovascular disease, cancer, respiratory and metabolic disorders (WHO Study group, 2003).

In industrialized countries such as Italy the most important association between diet and health is certainly the relationship with cardiovascular disease, the leading cause of death and disability. The ability to identify with certainty, therefore, the relationship between diet and cardiovascular disease appears to be a key element in the implementation of specific primary prevention strategies.

The first evidence of association between diet and physical well being was found in the 60s' following the first results of a study named the Seven Countries' Study (Keys et al., 1986). The first results of this study were surprising because they clearly showed that the countries of the Mediterranean basin (Italy and Greece) had the lowest incidence of death from cardiovascular disease and cancer than all other countries. From here the Mediterranean diet concept came out.

2. What are the cornerstones of this diet?

The main characteristics of this diet, summarized today in the iconography of the famous food pyramid are: daily consumption of carbohydrates and plant foods (fruits, vegetables, grains, nuts and legumes), olive oil as the main source of fat, low consumption of red meat, moderate consumption of wine, normally with meals.

In recent years, several studies have shown that strict adherence to a healthy dietary pattern, such as that characteristic of the Mediterranean diet is associated with a lower incidence of mortality.

Trichopoulou et al. (2003) in the New England Journal of Medicine have documented, in a population of 22.043 individuals followed for 44 months, that the mortality risk is inversely correlated with the grade of adherence to Mediterranean diet assessed by a score. It was observed that an increase of 2 points in this score was significantly associated with a reduction of 25% of global mortality (3). These results were confirmed in two meta-analysis performed by our group, which showed a population of over 2,000,000 people that an increase of 2 points of adherence to the Mediterranean diet led to a substantial reduction of overall mortality, of mortality and / or incidence of cardiovascular diseases, neoplastic diseases, as well as of neurodegenerative diseases like Parkinson's and Alzheimer's diseases (Sofi et al., 2008; 2010).

In recent years, however, despite the pressing claims of adherence to a nutritional profile similar to that of the classic Mediterranean diet the Mediterranean populations and in particular Italy has gradually lost their grade of adherence to Mediterranean diet in favour of a more Westernized diet.

The science of diet and chronic disease is relatively young, spanning perhaps only half a century. New advances offer substantial evidence from complementary research paradigms on cardiometabolic effects of specific dietary factors. Several recent evidence-based reviews conducted in conjunction with national and international policy-making efforts provide the context for the present report. The need to prioritize selected foods and overall dietary patterns rather than only individual nutrients, the relevance of carbohydrate and fat quality as well as quantity, the effects and policy implications of sodium consumption, the importance of energy balance, and the role of dietary supplements represent several key findings of interest. Evidence-based insights into successful individual and public health strategies for behavior change are also addressed. Overall, the present report is intended to provide a useful framework for health practitioners and policy makers to understand contemporary issues related to the effects of diet on CVD.

3. Fruits and Vegetables

In randomized controlled trials (RCTs), diets that emphasize consumption of fruits and vegetables produce substantial improvements in several risk factors, including blood pressure (BP), lipid levels, insulin resistance, inflammatory biomarker levels, endothelial func- tion, and weight control (He et al., 2006). Benefits do not appear reproducible with equivalent amounts of representative mineral and fiber supplements, nor are they dependent on