

MINIREVIEW

Recent data on Mediterranean diet, cardiovascular disease, cancer, diabetes and life expectancy

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Benefits of dietary moderation when on a mediterranean diet type (MD) have been known for well over half a century. In the past, there has been a vigorous renewal of interest in preventive potential of MD. This review is unique, by focusing on the very recent confirmatory data on the MD, all published within the first half of 2014. Benefits of MD in preventing and reducing cardiovascular disorders (CVD), known before, have been strongly confirmed. While there is little doubt regarding potential benefit of MD for obesity, diabetes type II, metabolic syndrome and fatty liver, critical evaluation has to be aimed at reported benefits of MD in such widely metabolic diverse disorders as cancer, pulmonary disease and cognition defects, including Alzheimer disease (Ref. 20). Text in PDF www.elis.sk.

Key words: mediterranean diet, cardiovascular diseases, hypertension, cancer, metabolic syndrome, diabetes, hepatic steatosis, life expectancy, oleocanthal, resveratrol, sirtuins, telomeres.

Mediterranean diet (MD) is characterized by abundant plant foods (fresh fruit, vegetables, breads, other forms of cereals, potatoes, beans, nuts, and seeds), olive oil as the principal source of fat, dairy products (principally cheese and yogurt), fish and poultry consumed in moderate amounts, red meat consumed in low amounts and wine.

MD and vascular system

Consistent evidence suggests that the promotion of the MD is an effective and feasible tool for the prevention of CVD (1). Although mixed nuts appear to be an important beneficial component in the MD, special emphasis is frequently attributed to extra virgin olive oil (2, 3).

Beneficial effect of MD in preventing CVD and thereby improving life expectancy (LE) were initially associated with the lowering of plasma cholesterol. Mechanism of MD effect is more complex. Not the least, consumption of MD reduces the blood pressure (4). Such effect of MD is possibly associated with lower risk of sudden cardiac death in postmenopausal women (5). Mediterranean diet rich in fat of vegetable origin may be a useful tool for the management of metabolic syndrome without a concern for weight gain due to its high fat content (6). In obese children and adolescents, MD significantly decreased the body mass index (BMI), fat mass, plasma glucose, total and LDL-cholesterol as well as triglycerides (7). MD resulted in an increased consumption of omega 9 fatty acids, zinc, vitamin E, selenium and decreased intake of saturated fatty acids.

Extensive metaanalysis confirmed the prominent effect of MD on outcomes of endothelial function and inflammation (8). MD resulted in a significant increase in flow mediated dilatation and adiponectin, while pro-inflammatory C reactive protein, interleukin-6 and intracellular adhesion molecule-1 were significantly decreased. Extra virgin olive oil incorporated into MD, blunts post-prandial oxidative stress via down-regulation of nicotinamide adenine dinucleotide phosphate-oxidase (NOX2) (9).

Another protective factor in MD may be the magnesium. The relation between dietary magnesium intake and CVD mortality was evaluated in several prospective studies. MD contains a generous amount of Mg. Magnesium intake from MD was inversely associated with cardiovascular, cancer and all-cause mortality (10).

MD and type 2 diabetes

Diabetes is an important metabolic disorder contributing to CVD. An extensive metaanalysis including 136,846 participants indicated that a higher adherence to MD was associated with 23 % reduced risk of developing type 2 diabetes (11). In patients with newly diagnosed type 2 diabetes, consumption of MD resulted in a greater reduction of HbA1c levels, higher rate of diabetes remission, and delayed need for diabetes medication, compared to a less specific low-fat diet (12). MD enriched with extra-virgin olive oil but without energy restrictions reduced diabetes risk among persons with a high cardiovascular risk (13).

MD and cancer

Past reports regarding a potential preventive effect of MD in cancerogenesis were considered doubtful. New light on this con-

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troverly was shed with an extensive metaanalysis that was based on twenty-one cohort studies including 1,368,736 subjects and 12 case-control studies, with 62,725 subjects. These populations met the review objectives and were enclosed for meta-analyses (14). A high adherence to MD was associated with a significant reduction in the risk of overall cancer mortality (10 %), colorectal cancer (14 %) and prostate cancer. Nonsignificant changes were for breast cancer, gastric cancer and pancreatic cancer. Another study provided the evidence of a beneficial role of MD on cancer of the oral cavity and pharyngeal malignancy (15).

The biological mechanisms for cancer prevention associated with the Mediterranean diet have been related to the favourable effect of a balanced ratio of omega 6 and omega 3 essential fatty acids, as well as the high amount of fibre, antioxidants and polyphenols found in fruit, vegetables, olive oil and wine.

Benefits of MD supposedly also extend, in addition to cancer, to other non communicable diseases, to the Parkinson and Alzheimer disease. Several components of the MD have demonstrated benefits in controlling the pathophysiological mechanisms involved in preventing the nonalcoholic fatty liver disease (16).

Recently, positive effects of MD were attributed to the presence of polyphenols and their derivatives (e.g. oleocanthal) that by exerting an anti-inflammatory and anti-oxidative effect can be involved in the reduction of age-related pathologies, such as cardiovascular, neoplastic, metabolic and neurodegenerative diseases (17). The scientific explanation of such beneficial effects was limited to the reduction of the oxidative stress by compounds present in the MD. A new class of proteins called sirtuins have gained the attention because of their antiageing effects, their ability to protect from cardiovascular, metabolic, neurodegenerative diseases, cancer and to extend the lifespan. Resveratrol, a polyphenol present in grapes, nuts and berries has been shown to activate sirtuins and such activation is able to explain some beneficial effects of the MD (18).

MD, longevity and telomeres

In 1970, The Seven Countries Study found that Cretan men had an exceptionally high LE and low death rates from heart disease, despite moderate to high intake of fat. Most recent data on LE in the Mediterranean countries indicate male LE to be close to 80 years (Italy and Cyprus), female LE (Spain, France and Italy) to be close to 85 years, being some of the highest LE in Europe.

Postulated beneficial effect of MD is related to prevention of shortening of telomeres. Telomeres are nucleoprotein structures that protect the ends of eukaryocyte chromosomes. In depth research on MD supports a novel role of MD in promoting health span, suggesting that telomere maintenance is the major determinant of health among the elderly (17). Shorter telomere length is associated with several age-related human disorders and subsequent shorter LE. Telomere length is a better indicator of LE than chronological age. Telomere length and kinetic predict mortality. An increase in telomere length was noted after a five year MD intervention (18).

Conclusion

There is enough evidence that a diet rich in plant fibre, phytochemicals, fatty acids derived from fish and plant oil, is beneficial. Population residing in the Mediterranean territory outperforms other Europeans in longevity and lower incidence of cardiovascular disorders. Benefits of a Mediterranean diet (MD) are well supported by solid scientific evidence based on outcome of pro-inflammatory factors, as well as very credible data on cell biological components, nucleoprotein telomeres and anti-ageing sirtuins. Still, critical appraisal is needed for overly enthusiastic reports coming out of the coffee grinder fed by metaanalyses, based on enormous number of observed individuals. Large epidemiological studies are subject to potential bias induced by inclusion of hard to control confusing variables. MD is not a strictly defined formula and it varies between communities and individuals. A selection bias in large dietary studies may be induced by the extent of health consciousness in dieting individuals. Non dietary factors present in the Mediterranean littoral are usually not considered: level of exercise, vitamin D saturation from sun exposure, role of alcohol intake and smoking. There is a natural inclination, not always productive, for enthusiastic acceptance of one of the most natural component of alternative medicine, the food. Cancer, pulmonary disease and cognitive disorders, including Parkinson and Alzheimer, represent widely divergent pathophysiological processes. Best research and multibillion investments have been trying to decipher these troubling maladies. It appears too fortuitous for a diet to offer a universally applicable miracle answer.

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