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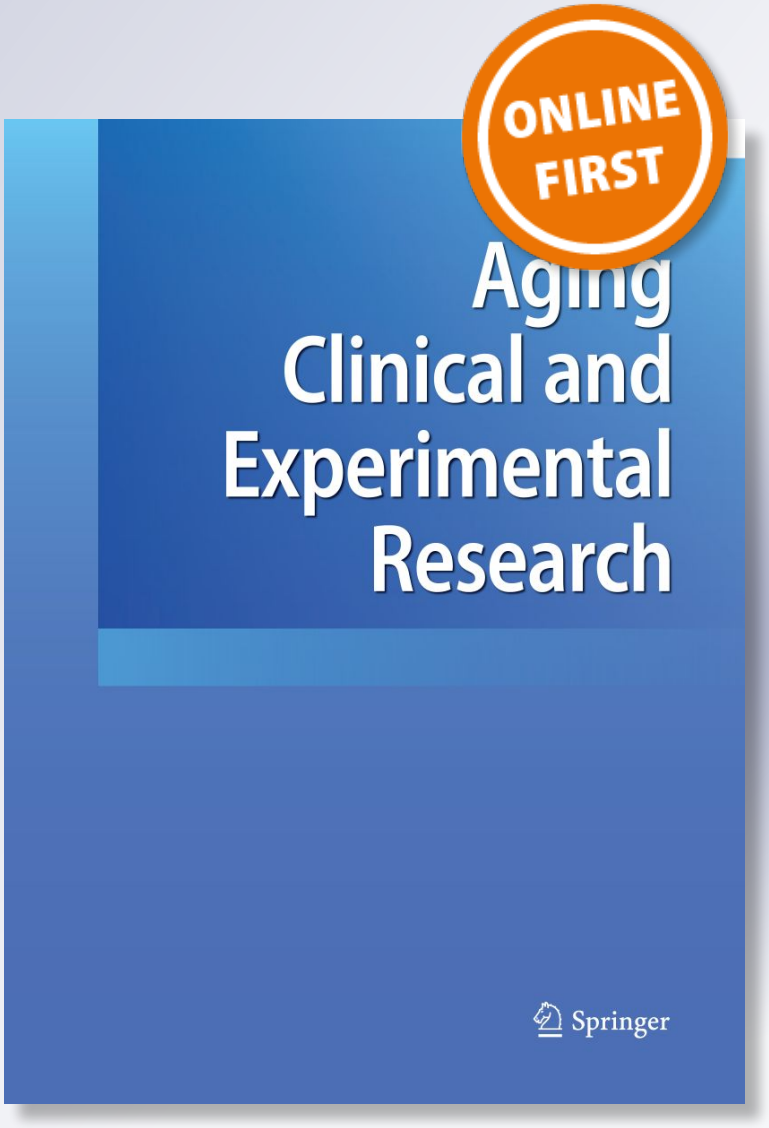

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BOOK REVIEW

The Mediterranean diet: a pathway to successful aging

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The Mediterranean diet has long been known for its health benefits. As early as during the 1950s, Ancel Keys, an American researcher who studied the influence of the diet on health, championed the utility of the Mediterranean diet in keeping serum cholesterol levels down and in reducing myocardial infarction risk.

In 1970, Ancel Keys published the findings of the "Seven Country Study", which investigated diet + lifestyle + other risk factors for cardiovascular disease across several countries and cultures over an extended period of time, in an article in the prestigious journal *Circulation*. The study clearly demonstrated that coronary heart disease (CHD) in the men between 40 and 59 living in seven different countries was significantly associated with the type of diet they were following and, in particular, to the saturated fat content of the diet. Compared to the individuals following a Mediterranean-type diet, who showed a relatively low incidence of CHD (Greece = 32 cases/10,000/year; Yugoslavia = 53 cases/10.000/year; Italy = 100 cases/10,000/year), men living in the United States and Finland, countries where a (western) diet high in saturated fat was predominantly followed, showed a significantly higher incidence of CHD, which reached 177 and 198 cases/10,000/year, respectively.

Further studies showed that the Mediterranean diet could prevent and manage not only diseases of the cardiovascular system, but many others as well, including diabetes, hypertension, cancer, thrombosis and neurodegenerative disorders, including dementia.

The book "Benefits of the Mediterranean Diet in the Elderly Patients", recently published by Springer, highlights the numerous effects of the Mediterranean diet and their specific effects on metabolism and diseases. The beneficial effects of the Mediterranean diet's single components (fish, cereals, legumes/pulses, vegetables, fresh fruits, nuts, and wine) appear to be linked essentially to their high content in fiber, unsaturated fatty acids, antioxidants, vitamins, and phytochemicals. An example of a healthy food is represented by cruciferous vegetables, belonging to the Brassicaceae family and including kale, collard greens, and cauliflower. These vegetables, rich in sulfur-containing chemicals, have well-known anti-cancer effects. They have, in fact, been demonstrated to block or delay cancer onset and progression by altering the metabolism of some carcinogens, by inducing cell cycle arrest and apoptosis and inhibiting angiogenesis and metastasis. These effects are predominantly obtained through epigenetic mechanisms that interfere with DNA methylation, histone modifications, and microRNA profiles.

It should be stressed that the numerous phytochemicals present in the Mediterranean diet often exert their effects by working in synergy with other molecules. This is why single components of the diet are generally not able to replace the effect of the combination of natural phytochemicals making up the Mediterranean diet. *Lycopene*, for example, is a naturally occurring carotenoid in tomatoes to which it gives its characteristic red color. This carotenoid is not nutritionally active or available for intestinal absorption when it is in its fresh form in tomatoes; it however, becomes activated and absorbed by the intestine when it is dissolved in olive oil and heated.

Another intriguing aspect of Mediterranean diet presently being investigated regards the diet's nutrigenetic/nutrigenomic effects. Through epigenetic mechanisms, in fact, the Mediterranean diet has been shown to modify the gene transcription activity of numerous genes without altering the underlying sequence.

Interesting data has been provided by the PREDIMED Study, a large, parallel-group, multicenter, randomized controlled trial, that was designed to assess the Mediterranean diet's long-term effects on cardiovascular disease and

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diabetes. The DNA was isolated in the 7018 participants of this study and the TCF7L2 gene polymorphism was evaluated. The aim was to investigate whether the associations between the rs7903146 (C>T) polymorphism of the TCF7L2 gene and type 2 diabetes, glucose lipids and cardiovascular disease incidence are modulated by the Mediterranean diet. It is known that individuals with the TT genotype more frequently progress to type 2 diabetes with respect to those with the CC genotype. The study found that the TT subjects who admitted to a low adherence to the Mediterranean diet had high fasting glucose, total cholesterol, LDL cholesterol, and triglyceride levels, and high stroke incidence. On the contrary, the TT subjects who admitted to a high adherence to the Mediterranean diet did not register high levels of fasting glucose, total- and LDL-cholesterol, and their stroke incidence data were as low as those found in the CC carriers and in the normal control subjects.

The protective effects of the Mediterranean diet have been shown to be linked, to a large extent, to the high polyphenol content of extra virgin olive oil (EVOO), which is able to modify gene transcription activity. In fact, in a recent study, a pre- and postchallenge gene and microRNA (miRNA) expression analysis was performed on the human peripheral blood mononuclear cells (PBMCs) of 12 healthy subjects and 12 patients with metabolic syndrome using microarray and real time qPCR. The study showed that a single intake of 50 ml of a polyphenol-rich EVOO ameliorated the glycaemia and insulin sensitivity of the patients and modulated the transcription of numerous genes and miRNAs involved in metabolism, inflammation, and cancer. These effects were not observed in the subjects receiving EVOOs with a low content of polyphenols. The authors concluded that the nutrigenomic effects of EVOO were principally due to polyphenols.

The book "Benefits of the Mediterranean Diet in the Elderly Patients", provides a broad, in-depth description of the numerous beneficial effects of the Mediterranean diet both as a single entity and linked to its single components.[1] It can be considered a useful tool for students, scholars, health care officials and the ordinary layman who would like to learn more about this extraordinary diet.

[1] Capurso A, Crepaldi G, Capurso C (2018) Benefits of the Mediterranean diet in the Elderly Patients. Springer International Publishing AG