

# **THE POSSIBLE ROLE OF THE MEDITERRANEAN DIET IN THE PREVENTION OF NEURODEGENERATIVE DISORDERS**

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## **Background**

While the importance of nutrition is well established in the prevention of cardiovascular disease, obesity, type 2 diabetes and other metabolic disorders, the role of the diet and nutrition is less studied in the prevention of neurodegenerative disorders. The literature is still controversial regarding the influence of different nutritional patterns on delaying cognitive decline: evidence comes mainly from retrospective cohort studies; only a few prospective studies with longer observation periods exist and clinical trials are rare.

## **The “Mediterranean” Diet**

An important question exists as to what nutritional style could potentially reduce the risk of cognitive decline and delay the onset of neurodegenerative disorders such as Alzheimer disease and vascular dementia. The most investigated diet associated with healthy brain aging is the Mediterranean Diet (MD). Adherence to the MD is one of the top five modifiable protective factors against Alzheimer Disease and cognitive decline, and is also included in the WHO guidelines on the basis of moderate quality evidence. The Mediterranean Diet reflects the dietary habits common among populations living along the Mediterranean Sea during the 1960s. The MD includes: high amounts of fruits, vegetables, nuts, whole grains and legumes; moderate amounts of fish (rich in polyunsaturated omega 3-fatty acids), poultry and low-fat dairy products; and low amounts of red meat. Extra virgin olive oil (rich in monounsaturated fat and phenolic compounds) is the main type of added fat and wine is consumed in modest amounts during meals. However, there is no universal definition of the MD and thus no uniform indications for its food composition (e.g. serving number and sizes).

## **How can the Mediterranean Diet prevent neurodegenerative diseases?**

Although the pathophysiological pathway has not been fully understood yet, it has been speculated that neurodegenerative diseases and other cardiovascular diseases could share a common mechanism of pathology. This includes low-grade inflammation and oxidative stress, as potential triggers of the metabolic changes leading to vascular disease and neurodegeneration, and adherence to MD has been associated with decreased levels of inflammation and oxidative stress.

## **The Mediterranean Diet: summary of the evidence**

The potential role of the MD in the preventing or delaying cognitive decline and dementia has been investigated in numerous, mostly observational, or cross-sectional studies. Evidence coming from these epidemiological studies may suggest that consumers with stronger adherence to the MD are less likely develop cognitive impairment and ischemic stroke as compared to people who follow diets rich in meat and dairy products (e.g. Western Diet); added benefits may exist when the Mediterranean diet is associated with physical activity or associated with a generally healthy lifestyle. Beside observational evidence there are also some encouraging results coming from a few randomized clinical trials (such as PREDIMED- the Prevención con Dieta Mediterránea study) which may point to a possible protective effect of MD on cognitive decline. However, further strong evidence and larger studies are needed to establish a solid correlation.

## **Conclusion**

In conclusion, the evidence from current studies, mainly epidemiological, is not conclusive on the protective effects of the Mediterranean diet on neurodegenerative diseases which is partly due to the possible influence of other confounding lifestyle factors. However, the role of nutrition cannot be ruled out either. There is a need for more longitudinal follow-up studies and eventually randomized clinical trials to confirm positive results. It is likely that diet is not an isolated factor but part of a

complex picture that includes other lifestyle factors such as regular physical activity, psychosocial wellbeing, control of cardiovascular risk factors, low alcohol consumption and abstinence from smoking.

### **Highlight Box**

- Nutrition play a role in not only preventing cardiovascular diseases, but also preventing neurodegenerative diseases, hypothetically acting on a common pathway related to inflammation and oxydative stress.
- The Mediterranean diet (MD) includes: high amounts of fruits, vegetables, nuts, whole grains and legumes; moderate amounts of fish (rich in polyunsaturated omega 3-fatty acids), extra virgin olive oil (rich in monounsaturated fat and phenolic compounds), poultry, and low-fat dairy products; and low amounts of red meat.
- Evidence coming from epidemiological studies, although not conclusive, may point to a possible protective effect of the MD on cognitive decline; however more long-term longitudinal follow-up and eventually randomized clinical trials will be needed to confirm this correlation.
- Diet may not be an isolated facor but be part of a compliation of other lifestyle factors such as regular physical activity, psychosocial wellbeing, control of cardiovascular risk factors, low alcohol consumption and abstinence from smoking.

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