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## OliveNet™ Journal Club

### Expert review of literature related to olives and olive oil

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#### Title

**Aging process, adherence to Mediterranean diet and nutritional status in a large cohort of nonagenarians: Effects on endothelial progenitor cells**

#### Author(s)

Cesari et al

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#### Keywords

Mediterranean diet, aging, nonagenarians, endothelial progenitor cells, circulating progenitor cells

#### Summary

This study assesses the effects of adherence to a Mediterranean diet on aging by evaluating levels of endothelial progenitor and circulating progenitor cells in nonagenarians. Accumulating evidence highlighting the beneficial health effects of a Mediterranean diet against a wide range of chronic diseases forms the basis of this investigation (2). The study represents a sub-study of the Mugello (region in northern Tuscany, Italy), epidemiological study aimed at investigating various parameters of health and predictors of mortality (e.g. functional and cognitive status in relation to nutritional status) (3). It is a relatively large-scale study evaluating a total of 421 people >90 years of age (306 F; 115 M). Adherence to the Mediterranean diet was assessed using the Mediterranean diet score, which is an accepted scale of adherence (4). The study involved stratification of people based on the Mediterranean diet score with the 1<sup>st</sup>-3<sup>rd</sup> quartiles representing scores <36, and the 4<sup>th</sup> quartile representing scores  $\geq$  36. Using specific antibodies, flow cytometric analysis was utilised to measure endothelial progenitor and circulating progenitor cells in nonagenarians, and the data was analysed in relation to nutritional status.

#### Key points and implications

The study was motivated by the importance of vascular homeostasis and declining endothelial function with age, and the strong relationship between endothelial cell dysfunction and cardiovascular diseases (5). It has become apparent that bone marrow-derived endothelial progenitor cells and circulating progenitor cells are key components of vascular homeostasis and important in repairing the endothelial cell layer following injury (5, 6). Further, it has been shown that the function and absolute numbers of bone marrow-derived endothelial progenitor cells and circulating progenitor cells declines with aging, highlighting the importance of potential preservation through nutrition (5). The findings indicated increased numbers of endothelial

progenitor cells and circulating progenitor cells in nonagenarians, which correlated with adherence with a Mediterranean diet. Further stratification of the data indicated that daily consumption of olive oil and fruits and vegetables produced the highest beneficial effects with respect to numbers of endothelial progenitor cells and circulating progenitor cells in nonagenarians. Overall, this is an important study with captivating findings warranting further investigation. The potential to modify levels of progenitor cells in aging by modifying dietary patterns is intriguing, and a topic of research which requires much further exploration.

### Related publications

1. F. Cesari *et al.*, Aging process, adherence to Mediterranean diet and nutritional status in a large cohort of nonagenarians: Effects on endothelial progenitor cells. *Nutrition, metabolism, and cardiovascular diseases : NMCD*, (2017).
2. M. Dinu, G. Pagliai, A. Casini, F. Sofi, Mediterranean diet and multiple health outcomes: an umbrella review of meta-analyses of observational studies and randomised trials. *European journal of clinical nutrition*, (2017).
3. R. Molino-Lova *et al.*, The Mugello study, a survey of nonagenarians living in Tuscany: design, methods and participants' general characteristics. *European journal of internal medicine* **24**, 745-749 (2013).
4. D. B. Panagiotakos, C. Pitsavos, F. Arvaniti, C. Stefanadis, Adherence to the Mediterranean food pattern predicts the prevalence of hypertension, hypercholesterolemia, diabetes and obesity, among healthy adults; the accuracy of the MedDietScore. *Preventive medicine* **44**, 335-340 (2007).
5. F. Paneni, C. Diaz Canestro, P. Libby, T. F. Luscher, G. G. Camici, The Aging Cardiovascular System: Understanding It at the Cellular and Clinical Levels. *Journal of the American College of Cardiology* **69**, 1952-1967 (2017).
6. F. Cesari *et al.*, Adherence to lifestyle modifications after a cardiac rehabilitation program and endothelial progenitor cells. A six-month follow-up study. *Thrombosis and haemostasis* **112**, 196-204 (2014).