

Endocr Metab Immune Disord Drug Targets

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. 2018;18(1):36-50.

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Anti-inflammatory Activity of Extra Virgin Olive Oil Polyphenols: Which Role in the Prevention and Treatment of Immune-Mediated Inflammatory Diseases?

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- PMID: 29141574
- DOI: [10.2174/1871530317666171114114321](https://doi.org/10.2174/1871530317666171114114321)

Abstract

Background and objective: Altered inflammatory response characterizes chronic immunemediated inflammatory diseases (IMID) such as rheumatoid arthritis, inflammatory bowel disease, multiple sclerosis, systemic lupus erythematosus, and psoriasis. Accumulating evidence indicates that regular consumption of extra virgin olive oil (EVOO), the main source of fat in the Mediterranean diet, is associated with a reduced risk of developing chronic degenerative disorders such as cardiovascular diseases, type 2 diabetes and cancer. The beneficial effects on health of EVOO have been attributed, besides to the monounsaturated fats content, to the presence of phenolic compounds that have antioxidant,

anti-inflammatory and immunomodulatory properties. The purpose of this review is to provide an overview of the effects of EVOO polyphenols on IMID highlighting the potential mechanisms of action.

Methods: Scientific papers were found by searching in PubMed up to May 2017 using the following key words: rheumatoid arthritis, inflammatory bowel disease, multiple sclerosis, systemic lupus erythematosus, and psoriasis also in combination with EVOO, phenolic compounds, oleuropein, oleocantal, hydroxytyrosol, tyrosol and oleocantal.

Results: In vitro and in vivo studies indicate that EVOO and its polyphenols can improve diseases symptoms in IMID, by acting both at local and systemic levels and by modulating several molecular pathways. Nevertheless, there are not sufficient data to achieve specific nutritional guidelines.

Conclusion: Further research is needed to evaluate the real contribution of EVOO and its phenolic compounds in modulating the IMID-associated inflammatory perturbations, in order to develop appropriate nutritional recommendations.

Keywords: Anti-inflammatory; EVOO polyphenols; antioxidant; extra virgin olive oil; immune-mediated inflammatory diseases; phenolic compounds.

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Olive Oil Phenols and Neuroprotection

[Ali Reza Khalatbary](#)¹

Affiliations expand

- PMID: 23406576
- DOI: [10.1179/1476830513Y.0000000052](https://doi.org/10.1179/1476830513Y.0000000052)

Abstract

Olive oil is a rich source of phenolic components which have a wide variety of beneficial health effects in vitro, in vivo, and clinically. The beneficial effects of olive oil phenols attributed to a variety of biological activities including free radical scavenging/antioxidant actions, anti-inflammatory effects, anti-carcinogenic properties, and anti-microbial activities. On the other hand, olive oil phenols have been shown to be some of neuroprotective effects against cerebral ischemia, spinal cord injury, Huntington's disease, Alzheimer's diseases, multiple sclerosis, Parkinson's disease, aging, and peripheral neuropathy. This paper summarizes current knowledge on the mechanisms of neuroprotective effects of olive oil phenols.

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Review

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doi: 10.2174/138161211795428911.

Molecular Mechanisms of Inflammation. Anti-inflammatory Benefits of Virgin Olive Oil and the Phenolic Compound Oleocanthal

[Lisa Lucas](#)¹, [Aaron Russell](#), [Russell Keast](#)

Affiliations expand

- PMID: 21443487
- DOI: [10.2174/138161211795428911](https://doi.org/10.2174/138161211795428911)

Abstract

Chronic inflammation is a critical factor in the pathogenesis of many inflammatory disease states including cardiovascular disease, cancer, diabetes, degenerative joint diseases and neurodegenerative diseases. Chronic inflammatory states are poorly understood, however it is known that dietary habits can evoke or attenuate inflammatory responses. Popular methods to deal with inflammation and its associated symptoms involve the use of non steroidal anti-inflammatory drugs, however the use of these drugs are associated with severe side effects. Therefore, investigations concerned with natural methods of inflammatory control are warranted. A traditional Mediterranean diet has been shown to confer some protection against the pathology of chronic diseases through the attenuation of pro-inflammatory mediators and this has been partially attributed to the high intake of virgin olive oil accompanying this dietary regime. Virgin olive oil contains numerous phenolic compounds that exert potent anti-inflammatory actions. Of interest to this paper is the recently discovered phenolic compound oleocanthal. Oleocanthal is contained in virgin olive oil and possesses similar anti-inflammatory properties to ibuprofen. This pharmacological similarity has provoked interest in oleocanthal and the few studies conducted thus far have verified its anti-inflammatory and potential therapeutic actions. A review of the health benefits of the Mediterranean diet and anti-inflammatory properties of virgin olive oil is presented with the additional emphasis on the pharmacological and anti-inflammatory properties of the phenolic compound oleocanthal.

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. 2018;18(1):14-22.

doi: 10.2174/1871530317666171114113822.

Effect of Extra Virgin Olive Oil and Table Olives on the Immune Inflammatory Responses: Potential Clinical Applications

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Affiliations expand

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- DOI: [10.2174/1871530317666171114113822](https://doi.org/10.2174/1871530317666171114113822)

Abstract

Background and objective: Extra virgin olive oil (EVOO) is the common element among the Mediterranean countries. It can be considered a nutraceutical and functional food, thanks to its bioactive compounds. It can act and modulate different processes linked to ageing and age-related diseases related to a common chronic low grade inflammation. Depending on the cultivar, the growth conditions, the period of harvesting, the productive process and time of product storage, EVOO could contain different amount of vegetal components. Of course, the same is for table olives.

Methods: The aim of our review is to summarize the effects of EVOO and table olives on the immunemediated inflammatory response, focusing our attention on human studies.

Results: Our report highlights the effect of specific molecules obtained from EVOO on the modulation of specific cytokines and anti-oxidants suggesting the importance of the daily consumption of both EVOO and table olives in the context of a Mediterranean dietary pattern. In addition, the different action on immune-inflammatory biomarkers, are depending on the olive tree cultivar.

Conclusion: Thanks to their bioactive compounds, EVOO and table olive can be considered as nutraceutical and functional foods. The beneficial effects analysed in this review will help to understand the potential application of specific olive components as therapeutic adjuvant, supplements or drugs.

Keywords: EVOO; mediterranean diet; neuroinflammation; nutraceuticals; polyphenols; table olives.

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Molecules

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doi: 10.3390/molecules20034655.

Potential Role of Olive Oil Phenolic Compounds in the Prevention of Neurodegenerative Diseases

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Affiliations expand

- PMID: 25781069
- PMCID: [PMC6272603](#)
- DOI: [10.3390/molecules20034655](#)

Free PMC article

Abstract

Adherence to the Mediterranean Diet (MD) has been associated with a reduced incidence of neurodegenerative diseases and better cognitive performance. Virgin olive oil, the main source of lipids in the MD, is rich in minor phenolic components, particularly hydroxytyrosol (HT). HT potent antioxidant and anti-inflammatory actions have attracted researchers' attention and may contribute to neuroprotective effects credited to MD. In this review HT bioavailability and pharmacokinetics are presented prior to discussing health beneficial effects. In vitro and in vivo neuroprotective effects together with its multiple mechanisms of action are reviewed. Other microconstituents of olive oil are also considered due to their potential neuroprotective effects (oleocanthal, triterpenic acids). Finally, we discuss the potential role of HT as a therapeutic tool in the prevention of neurodegenerative diseases.

Conflict of interest statement

The authors declare no conflict of interest.

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Vasculoprotective Potential of Olive Oil Components

[Maria Annunziata Carluccio](#)¹, [Marika Massaro](#), [Egeria Scoditti](#), [Raffaele De Caterina](#)
Affiliations expand

- PMID: 17912721

- DOI: [10.1002/mnfr.200600305](https://doi.org/10.1002/mnfr.200600305)

Abstract

Epidemiological and clinical studies found that the traditional Mediterranean-style diet is associated with significantly lower mortality from coronary artery disease. Although it is difficult to isolate individual dietary factors, cumulative evidence suggests that olive oil, used as primary source of fat by Mediterranean populations, may play a key role in the observed cardiovascular benefit. Olive oil is a priceless source of vitamins and polyphenolic antioxidants, and has a balanced ratio of monounsaturated and polyunsaturated fatty acids. There are multiple mechanisms by which olive oil might impact the development of atherosclerosis. Olive oil decreases LDL-cholesterol and increases HDL-cholesterol, and also reduces oxidative stress due to polyphenols, which are able to scavenge free radicals and protect LDL from oxidation. In addition, olive oil components may interfere with the inflammatory response within atherosclerotic lesion, by inhibiting endothelial activation involved in monocyte recruitment during early atherogenesis and macrophage production of inflammatory cytokines and matrix degrading enzymes, thus improving vascular stability. Other vasculoprotective mechanisms by olive oil components derive from anti-thrombotic and anti-hypertensive actions. The available data support the need to preserve certain dietary traditions, such as olive oil consumption, to counteract the burden of cardiovascular disease.

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Int J Mol Sci

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doi: 10.3390/ijms150712323.

Oleocanthal, a Phenolic Derived From Virgin Olive Oil: A Review of the Beneficial Effects on Inflammatory Disease

[Lisa Parkinson](#)¹, [Russell Keast](#)²

Affiliations expand

- PMID: 25019344
- PMCID: [PMC4139846](#)
- DOI: [10.3390/ijms150712323](#)

Free PMC article

Abstract

Virgin olive oil (VOO) is credited as being one of many healthful components of the Mediterranean diet. Mediterranean populations experience reduced incidence of chronic inflammatory disease states and VOO is readily consumed as part of an everyday dietary pattern. A phenolic compound contained in VOO, named oleocanthal, shares unique perceptual and anti-inflammatory characteristics with Ibuprofen. Over recent years oleocanthal has become a compound of interest in the search for naturally occurring

compounds with pharmacological qualities. Subsequent to its discovery and identification, oleocanthal has been reported to exhibit various modes of action in reducing inflammatory related disease, including joint-degenerative disease, neuro-degenerative disease and specific cancers. Therefore, it is postulated that long term consumption of VOO containing oleocanthal may contribute to the health benefits associated with the Mediterranean dietary pattern. The following paper summarizes the current literature on oleocanthal, in terms of its sensory and pharmacological properties, and also discusses the beneficial, health promoting activities of oleocanthal, in the context of the molecular mechanisms within various models of disease.

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J Agric Food Chem

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Hydroxytyrosol and Its Potential Therapeutic Effects

[Ting Hu](#)¹, [Xiao-Wei He](#), [Jian-Guo Jiang](#), [Xi-Lin Xu](#)

Affiliations expand

- PMID: 24479643
- DOI: [10.1021/jf405820v](https://doi.org/10.1021/jf405820v)

Abstract

As olive oil is the main source of calories in the Mediterranean diet, a large number of studies have been carried out to characterize its role in various diseases and exploitation for the prevention and treatment of hypertension, carcinogenesis, diabetes, atherosclerosis, and other diseases. As one of the major polyphenols present in virgin olive oil, hydroxytyrosol shows a variety of pharmacological activities such as antioxidant properties, anticancer, anti-inflammatory, and neuroprotective activities, and beneficial effects on the cardiovascular system, which show its potentiality for the development of dietary supplements. In the future, more attention should be paid to its action mechanism in vivo and synergistic effect. Further research will be performed to provide the theoretical basis for hydroxytyrosol and its derivatives use as health supplements.

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