

Researcher finds olive oil to improve brain health, memory in mild cognitive impairment individuals

March 7 2023, by Matt Crouch



An Auburn University study tested the effects the consumption of extra virgin olive oil or refined olive oil had on participants experiencing mild cognitive impairment. Credit: Auburn University at Montgomery

Extra virgin olive oil may have positive effects on individuals with mild cognitive impairment, according to a recently completed study by Amal Kaddoumi in Auburn University's Harrison College of Pharmacy. Her findings, recently published in the journal *Nutrients*, suggest compounds found in olive oil impact brain health and improve the blood-brain barrier.

Kaddoumi, a professor in the college's Department of Drug Discovery and Development, utilized 25 participants experiencing mild cognitive impairment in her study that included consuming 30 milliliters, or about three tablespoons, of [olive oil](#) per day for six months. Thirteen participants consumed [extra virgin olive oil](#), or EVOO, and 12 consumed refined olive oil, or ROO. EVOO is rich in phenols, a class of organic compounds containing a [hydroxyl group](#) and a benzene ring, while the ROO has been purified of phenols.

"The participants were subjected to several tests before and after olive oil consumption, including MRI scans, a battery of cognitive tests and [blood analysis](#) for biomarkers related to Alzheimer's disease," said Kaddoumi. "Our findings showed that EVOO and ROO improved cognitive function as determined by the improved clinical dementia rating and other behavioral scores.

"Interestingly, the MRI scans results were not the same between EVOO and ROO. While EVOO enhanced the [blood-brain barrier](#) function and the functional connectivity between different brain areas, ROO increased the functional brain activation to a memory task in [brain regions](#) involved in cognition."

The blood-brain barrier and its permeability are key indicators in her study. A network of blood vessels and tissue made up of closely spaced cells, the blood-brain barrier plays a vital role in maintaining a healthy brain by protecting the brain from exposure to blood-related neurotoxins

and in the clearance of brain waste products. A functional blood-brain barrier is vital for a healthy brain.

"Regarding blood biomarkers, our findings showed that EVOO and ROO altered two major biomarkers related to Alzheimer's disease, namely, beta-amyloid and tau phosphorylation, suggesting EVOO and ROO changed the processing and clearance of beta-amyloid," said Kaddoumi. "These alterations collectively could have played role in improving the blood-brain barrier and improving function and memory."

The results are consistent with Kaddoumi's pre-clinical findings conducted in mouse models of Alzheimer's disease. The [pilot study](#) on individuals with mild cognitive impairment is the first to look at what directly happens to the brain in humans when consuming olive oil.

"While we need additional studies to understand the mechanisms by which olive oil exerted such effects in humans, findings from our preclinical studies in the mouse models of Alzheimer's disease showed that EVOO alleviated several pathological hallmarks of Alzheimer's disease," said Kaddoumi.

One surprising finding from the study was the results of the control group. The beneficial compounds found in olive oil are more prevalent in the unrefined EVOO, but those in the refined group saw improvement as well.

"We used ROO as the control or placebo group because it lacks the phenolic compounds in EVOO," said Kaddoumi. "However, based on the findings from this pilot study, ROO could also provide [health benefits](#) suggesting the positive impact of oleic acid, the primary monounsaturated fat present in both EVOO and ROO, which could contribute to the observed effect. Indeed, additional studies are

necessary to confirm these results."

Even with the need for further studies, Kaddoumi is excited to see the results from her pilot study and what it could mean for those living with Alzheimer's, dementia and other cognitive issues.

"These results are exciting because they support the health benefits of olive oil against Alzheimer's disease," said Kaddoumi. "Based on the findings of this study and previous pre-clinical studies by us and others, we can conclude that adding olive oil to our diet could maintain a healthy brain and improve memory function."

While the study used participants experiencing [mild cognitive impairment](#), Kaddoumi says next steps include a larger clinical trial that includes cognitively normal individuals. With the surprising results from the refined olive oil, she also envisions a trial with a variety of grades of olive oil.

"The research team and I would like to acknowledge and thank the project participants and relatives, without whom this research would have not been possible," said Kaddoumi.

More information: Amal Kaddoumi et al, Extra-Virgin Olive Oil Enhances the Blood–Brain Barrier Function in Mild Cognitive Impairment: A Randomized Controlled Trial, *Nutrients* (2022). [DOI: 10.3390/nu14235102](https://doi.org/10.3390/nu14235102)

Provided by Auburn University

Citation: Researcher finds olive oil to improve brain health, memory in mild cognitive impairment individuals (2023, March 7) retrieved 8 March 2023 from

<https://medicalxpress.com/news/2023-03-olive-oil-brain-health-memory.html>

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