

## Walnuts Mitigate Arterial Effects of Fat-Filled Meals

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BARCELONA, Spain, Oct. 10 -- Walnuts may be heart-healthy nuts, suggest Spanish researchers.

While both raw walnuts and olive oil decreased the sudden onset of arterial inflammation and oxidation after an unhealthy meal, the walnuts were better at keeping arteries flexible, they found.

But patients should not take this as an excuse to regularly eat fat-filled meals, followed by a handful of walnuts, said Emilio Ros, M.D., Ph.D., of the Lipid Clinic at Hospital Clínic here, and colleagues, in the Oct. 17 *Journal of the American College of Cardiology*.

The study, they pointed out, was small, and it looked at the effect of a single meal on individuals whose regular fare was a healthy Mediterranean diet.

Yet study participants had better arterial elasticity after a walnut-containing meal than an olive oil-containing meal. For those with moderately high cholesterol, postprandial flow-mediated dilation of the brachial artery was:

Improved by 24% when they ate walnuts with their high-fat meal (4.1% dilation before meal to 5.1% after), but

Impaired by 36% when they ate olive oil with the meal instead (3.6% dilation before meal to 2.3% after).

For individuals with normal cholesterol levels, the postprandial flow-mediated dilation was:

Unchanged in participants with normal cholesterol levels when they ate walnuts with the meal (4.2% dilation before meal to 4.2% after),

But impaired by 17% after they ate the olive oil-containing meal (4.7% dilation before meal to 3.9% after).

Both olive oil and walnuts appeared to improve inflammation and oxidation of the arteries that normally occurs after a high fat meal.

Inflammatory biomarkers of endothelial activation decreased similarly after both meals compared to control measurements taken before the meal. The exception was soluble E-selectin, an adhesion molecule involved in monocyte recruitment to the endothelium, which decreased more with walnuts than olive oil (8% decrease versus about 2%, time-period interaction  $P=0.033$ ).

The prospective crossover study, which was sponsored by the California Walnut Board, included 24

healthy individuals who did not smoke and had normal body weight and blood pressure.

After two weeks on a Mediterranean diet, participants were randomized to consume a salami and cheese sandwich on white bread. Added was a small serving of full-fat yogurt and either eight shelled walnuts or five teaspoons of olive oil soaked into the bread for a total of 120 mg cholesterol, 80 g fat and 1,200 kcal. After another week on the Mediterranean diet, the participants had the same meal with the other healthy addition.

Participants had their blood drawn and an ultrasound assessment of endothelial function in the brachial artery before and after the meal, which was given in the afternoon to avoid confounding by the early morning blunting in endothelial function.

Twelve of the participants had moderate hypercholesterolemia, defined as low-density lipoprotein cholesterol (150 to 220 mg/dL and triglycerides above 200 mg/dL). None took medications or antioxidant supplements.

No postprandial changes were observed in flow-independent dilation, blood pressure or heart rate. The hyperemic flow increased to a similar extent after both types of meals. Oxidized low density lipoproteins decreased postprandially for both test meals, which the authors said was unexpected.

Very low density lipoprotein (VLDL) triglyceride-to-apoB ratio, an indirect measure of large, very atherogenic particles, increased after both meals ( $P=0.001$ ), but less so after the walnut-containing meals for subjects with normal cholesterol (57% versus 85%,  $P=0.034$ ). The relationship between this measure and flow-mediated dilation approached statistical significance after the olive oil meal ( $P=0.088$ ) but not after the walnut meal ( $P=0.247$ ).

This finding may, in part, explain the differences seen between walnut- and olive oil-containing test meals, the authors said. "Abnormal vasoactivity after a lipid challenge has been related to accumulation of postprandial triglyceride-rich lipoproteins in other studies."

They also postulated that the differences could have been due to the 5.4 g alpha-linoleic acid (a plant-based omega-3 fatty acid) in the walnuts or other "cardioprotective constituents" such as L-arginine and antioxidants not found in the olive oil.

"The fact that a single walnut meal positively affects postprandial vasoactivity further supports the beneficial effects of walnuts on cardiovascular risk," Dr. Ros and colleagues wrote.

They said the study was limited by the small representation of women (20 men to four women) such that "the findings may only apply to men." Also, it is not clear whether the differences found in the study were due to "a beneficial effect of walnuts or a detrimental effect of olive oil, or both."

The investigators concluded that the "unsaturated fatty acids and antioxidants in both olive oil and walnuts appear to preserve the protective phenotype of endothelial cells" when eaten along with a fatty meal.

**Action Points**

Explain to interested patients that walnuts contain alpha-linoleic acid (a plant-based omega-3 fatty acid) and other "cardioprotective constituents" such as L-arginine and antioxidants.

Caution patients that the study looked at the effect of walnuts or olive oil added to a fatty meal in individuals on an otherwise healthy Mediterranean diet, rather than the effect on individuals who repeatedly ate high fat content meals, and did not deal with weight gain.

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Source reference:

Cortés B, et al "Acute Effects of High-Fat Meals Enriched With Walnuts or Olive Oil on Postprandial Endothelial Function" *J Am Coll Cardiol* 2006; 48:1666-71.