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**File: ■ Olive Oil (*Olea europaea*, Oleaceae)  
■ Mediterranean Diet  
■ Coronary Artery Disease**

**HC 101521-531**

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**RE: High Levels of Olive Oil Consumption Associated with Decreased Risk of Coronary Artery Disease**

Dimitriou M, Rallidis LS, Theodoraki EV, Kalafati IP, Kolovou G, Dedoussis GV. Exclusive olive oil consumption has a protective effect on coronary artery disease; overview of the THISEAS study. *Public Health Nutr.* July 2015:1-7. [epub ahead of print]. doi: 10.1017/S1368980015002244.

Coronary artery disease (CAD) is the most common condition associated with cardiovascular disease (CVD) and is the result of narrowing of the coronary arteries. CAD can lead to angina, myocardial infarction, and heart failure. The Seven Countries Study was one of the first to establish that dyslipidemia, hypertension, obesity, and environmental factors, including diet, activity level, stress, and smoking, affect the risk of developing CVD. Other studies have shown that the Mediterranean diet can provide a cardiovascular protective effect. The Mediterranean diet is characterized by high intake of fruits, vegetables, whole grains, chicken, fish, and olive (*Olea europaea*, Oleaceae) oil. Each of these components is likely to contribute to the reduction in CVD risk in some way. Studies have shown that olive oil can improve lipid profile, reduce oxidation of low-density lipoprotein cholesterol (LDL-C), and improve endothelial function. The Hellenic study of Interactions between Single-nucleotide polymorphisms and Eating and Atherosclerosis Susceptibility (THISEAS) is a case-controlled study that was conducted in Greece between 2006 and 2010. This report describes the relationship between the risk of developing CAD and socioeconomic status, anthropometrics, lifestyle choices, and biochemical markers.

Patients with CAD were recruited from hospitals, Centers of Open Protection for the Elderly, and municipalities in and around Athens, Greece. Outpatients or in-patients who did not have CAD and were not patients in a cardiology clinic were also recruited as controls. In addition, healthy subjects were recruited from the Centers of Open Protection for the Elderly and municipalities in and around Athens, Greece. An attempt was made to recruit twice as many control patients as case patients. The case patients had acute coronary syndrome or CAD with > 50% stenosis in at least 1 of the main coronary blood vessels. Patients were excluded if they had acute renal or hepatic disease.

Blood was collected after a 12-hour fast and measured for glucose, total cholesterol, triglycerides, LDL-C, and high-density lipoprotein cholesterol (HDL-C). Education level, marital status, socioeconomic status, physical activity level, smoking status, body weight and height, body mass index (BMI), and blood pressure were measured. Diet was evaluated using a 172-picture food frequency questionnaire that asked what food was consumed, how often, and in what proportions. Because it is common for diet to be modified after CAD diagnosis, information on diet was collected only from case patients who had been recently diagnosed with CAD. This resulted in dietary analysis of 60.4% of the case patients. Adherence to the Mediterranean diet and olive oil consumption were measured using the MedDietScore and additional questionnaires on fat consumption, respectively. Patients were also asked to note any prescription medications taken.

Of the 2565 patients enrolled in the study, 1221 were case patients, and 1344 were control patients. Of the 1221 case patients, 499 underwent dietary analysis, while 832 of the control patients underwent dietary analysis. The case patients were significantly older, were more likely to smoke or have smoked in the past, and had a lower level of education and income than the control patients ( $P < 0.001$  for all). In addition, the case patients had significantly higher cholesterol levels and blood pressure, were more likely to have diabetes, and more likely to be taking lipid-lowering medication ( $P < 0.001$  for all). The control patients had higher total cholesterol, HDL-C, and LDL-C than the case patients ( $P < 0.001$  for all). This is likely because many of the case patients were taking medications to control dyslipidemia. The case patients also had higher fasting blood glucose levels than the control patients ( $P < 0.001$ ). The control patients had significantly lower daily caloric intake but a significantly higher fat and olive oil intake than case patients ( $P < 0.001$ ). Lastly, olive oil consumption was associated with a decrease in risk of developing CAD. This decrease was as much as 48% in those that consumed olive oil exclusively.

A reduced risk of developing CAD was associated with higher levels of education, higher socioeconomic status, higher activity levels, not smoking cigarettes, lower BMI, and higher intake of olive oil. Most of these correlations have been confirmed with other studies, including the Minnesota Heart Survey and the ATTICA study. A decreased risk of developing CAD with increased olive oil consumption has been found in several other studies. In two studies, subjects in the highest olive oil consumption group had a reduced risk of developing CAD. In the Three-City Study, there was a reduced risk of stroke in the group with the highest olive oil consumption. However, according to the authors, this is the first study to control for confounding dietary influence on CAD rates and investigate the effect of exclusive olive oil consumption. Olive oil effects are thought to be mediated through changes in oxidative stress, inflammation, lipid peroxidation, and lipid profile. Limitations of the study, acknowledged by the authors, include recall bias of past diet and the unknown probability that control patients would be diagnosed with CAD soon after the study ended. The authors conclude that higher or exclusive olive oil consumption could be an important addition to nutritional protocols to prevent CAD.

—*Cheryl McCutchan, PhD*

The American Botanical Council has chosen not to include the original article.

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