Olive Oil Intake Is Associated with Reduced Risk for Incident Of Coronary Heart Disease Events

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Coronary heart disease (CHD) mortality and incidence are reportedly lower in countries with high levels of olive (*Olea europaea*) oil consumption compared with those with lower levels; however, few studies have shown that olive oil consumption prevents incident CHD events. Case-control studies on the relationship between CHD and olive oil are limited and have indicated inverse association or no association. Recent reviews on olive oil and cardiovascular disease have concluded that prospective studies are needed to support the role of olive oil in the primary prevention of CHD. These authors sought to prospectively study the relationship between olive oil consumption and the risk of incident CHD events in the European Prospective Investigation into Cancer and Nutrition (EPIC)-Spain cohort study.

A large, multicenter, prospective cohort study, the EPIC study is designed to examine the relationship between nutritional, lifestyle, metabolic, and genetic factors and the risk for cancer and other chronic diseases. These authors used the Spanish cohort of EPIC-Heart, the study's cardiovascular component. EPIC-Spain included 41,438 healthy volunteers, aged 29 to 69 years, recruited from 1992 to 1996 from five Spanish regions: Asturias, Granada, San Sebastian, Murcia, and Navarra. Of those participants, 38% were men.

Baseline dietary and lifestyle information was gathered by using interviewer-administered questionnaires. Weight, height, and waist circumference were recorded at recruitment.

Incident CHD events, identified from the time of recruitment until December 2004, were classified as definite (fatal or nonfatal acute myocardial infarction [MI] or unstable angina requiring revascularization procedures) or possible (fatal or nonfatal MI that did not meet all diagnostic criteria and fatal CHD with insufficient information).

Of the initial participants, 193 were excluded because of prevalent CHD, 806 for extreme total energy intake, and 297 for missing information on the date of a possible CHD event, diabetes, or hypertension. The remaining 40,142 participants (without a history of coronary events at recruitment) were included in the analyses.

Cox proportional regression models assessed the relationship between validated incident CHD events and olive oil intake, adjusting for potential confounders. Subgroup analyses evaluated CHD risk by type of olive oil intake.

The authors report that during a mean follow-up of 10.4 years, 587 incident CHD events were recorded (79% in men). The mean olive oil intake in the whole cohort was 20.1 g daily per 8368 kJ (2000 kcal); intake was highest in Navarra and Granada and lowest in Asturias. The authors note that 14.8% of the participants did not consume olive oil and that the participants with a higher intake of olive oil were more likely to have a secondary school education or above, be

hyperlipidemic, have a narrower waist circumference, a lower energy intake, and a higher Mediterranean diet score.

Although olive oil intake was inversely associated with CHD events, the association weakened after adjusting for lifestyle and dietary-related confounders. After excluding participants with poor concordance of energy intake to energy expenditure, report the authors, a 22% decreased risk of CHD was observed for the upper versus the lower olive oil quartile and a 7% (P=0.050) reduction in incident CHD was noted for each 10 g daily per 8368 kJ (2000 kcal) of olive oil consumed.

Subgroup analysis revealed a greater decreased risk of a CHD event with consumption of virgin olive oil (hazard ratio [HR], 0.86; 95% confidence interval [CI], 0.72-1.01) compared with ordinary olive oil (HR, 0.97 [text; Table 4 has 0.96.]; 95% CI, 0.91-1.03 [text; Table 4 has 1.02.]) for each 10 g daily per 8368 kJ (2000 kcal). Consumers of virgin olive oil had a 14% reduction in CHD risk (P=0.072) per 10 g/d. The authors note that the benefits of olive oil have been linked to its high content of monounsaturated fatty acids and its bioactive microcomponents such as polyphenols, especially the key polyphenol oleuropein that accounts for 80% of the total, which are abundant in virgin and extra virgin olive oil but not in ordinary olive oil.

Olive oil intake was associated with a reduced risk for CHD in never-smokers (11%; P=0.048), but not in ever-smokers. A significant negative association was observed in never- or light-drinkers of alcohol (a 25% decreased risk for CHD [P<0.001] for each 10 g daily of olive oil consumption), but no evidence of an association in moderate or heavy drinkers was seen. Because moderate alcohol intake can protect against CHD, the authors hypothesized that the beneficial effect of olive oil on CHD risk was only apparent in never- or light-drinkers because the alcohol's protective effect in moderate or heavy drinkers masked the more subtle effect of olive oil.

The authors note that their results are similar to those of earlier observational studies in Spain, Greece, and Italy, although their results show a more modest reduction in CHD risk, which could be due to differences in study designs and adjustment for confounding variables. These include failure to adjust for greater vegetable consumption associated with olive oil use as part of a Mediterranean diet or for the type of olive oil consumed (virgin vs. ordinary).

Among the strengths of this study are its long follow-up period, large sample of initially healthy individuals, and inclusion of validated CHD events. Among its limitations are the facts that although the authors adjusted for lifestyle factors strongly related to CHD, they could not rule out residual confounding and because the olive oil and dietary intakes were measured only at baseline, any changes during follow-up would not have been noted.

The authors conclude that their results provide some evidence that olive oil consumption is associated with a reduction in primary incident CHD events. An earlier study of this same cohort reported a 40% decreased risk of incident CHD events with high adherence to the entire Mediterranean diet.[1] "The present study therefore supports the contribution that olive oil makes within this dietary pattern in terms of reducing risk of CHD events. Our findings back the need to preserve the culinary use of olive oil within the Mediterranean dietary tradition," write the authors.

Reference

[1]Buckland G, González CA, Agudo A, et al. Adherence to the Mediterranean diet and risk of coronary heart disease in the Spanish EPIC Cohort Study. *Am J Epidemiol*. 2009;170(12):1518-1529.