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File: ■ Olive (*Olea europaea*) Oil
■ Cardiovascular Disease
■ Mortality

HC 071412-510

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RE: Olive Oil Consumption Reduces the Risk for Cardiovascular Disease and Mortality in an Elderly Mediterranean Population at High Risk for Cardiovascular Disease

Guasch-Ferré M, Hu FB, Martínez-González MA, et al. Olive oil intake and risk of cardiovascular disease and mortality in the PREDIMED study. *BMC Med*. 2014;12:78. doi: 10.1186/1741-7015-12-78.

Olive (*Olea europaea*) oil is one of the major components of the Mediterranean diet (MedDiet). The PREvención con DIeta MEDiterránea (PREDIMED) study has shown that a MedDiet enriched with extra virgin olive oil (EVOO) improved lipid profiles, decreased blood pressure, and reduced the risk of major cardiovascular events.[1,2] The aim of this observational, prospective cohort study was to evaluate the effect of olive oil (especially EVOO) consumption on the risk for cardiovascular disease (CVD) and mortality in a Mediterranean population at high risk for CVD.

This study was part of PREDIMED, a larger, multicenter, parallel-group, randomized trial evaluating the effects of the MedDiet on CVD risk. Individuals were recruited from various hospitals or institutions throughout Spain. A total of 7,447 subjects (men: 55-80 years and women: 60-80 years) were randomly assigned to 1 of 3 interventions – a MedDiet supplemented with EVOO, a MedDiet supplemented with mixed nuts, or a control diet (subjects given advice on a low-fat diet). The inclusion criteria were absence of CVD at enrollment and the presence of high risk factors for CVD (subjects had type 2 diabetes or at least 3 of the following risk factors: smoking habits, hypertension, high low-density lipoprotein [LDL] cholesterol, low high-density lipoprotein [HDL] cholesterol, overweight, and family history of premature CVD). Additionally, subjects were excluded if they had a body mass index (BMI) ≥40 kg/m^2 or any condition that would interfere with the study.

The outcomes of this study were composite of cardiovascular events, cardiovascular mortality, cancer mortality, and all-cause mortality. Dieticians completed food frequency questionnaires based on subject interviews at baseline and yearly during the follow-up period. In particular, questions evaluated the amount and frequency of EVOO (mechanically pressed olives, acidity <1%) and common olive oil (refined olive oil and pomace olive oil, acidity <0.3%) consumption. Compliance to the MedDiet was evaluated

using a 14-item MedDiet screener. Energy and nutrient intakes were measured based on Spanish food composition tables. The subject's lifestyle variables, medical history, physical activity, body measurements, and blood pressure measurements were also evaluated. Information on CVD mortality was obtained from yearly questionnaires/physical examinations, primary care physicians, yearly medical records, and the National Death Index. Cause of death and confirmation of cardiovascular events were confirmed by the End-point Adjudication Committee. Follow-up time was the interval between the date of randomization and the last date the subjects participated in the study. Results were also based on the following different multivariate model adjustments: model 1 (adjusted for age, sex, and the intervention group), model 2 (additionally adjusted for lifestyle variables and other potential confounders), and model 3 (additionally adjusted for baseline MedDiet adherence).

A total of 7,216 participants were included in the final analysis, after excluding the subjects with extremes of energy intake (n=153) and those with incomplete dietary information at baseline (n=78). The follow-up period with a median of 4.8 years included 277 major cardiovascular events, 81 cardiovascular deaths, 130 cancer deaths, and a total of 323 deaths. The mean age of subjects was 67 years (57.4% were women). Changes in total olive oil intake at the end of the follow-up period were 10.92 ± 22.91 g/d for those consuming the MedDiet with EVOO, 2.36 ± 21.81 g/d for those given the MedDiet with nuts, and -3.03 ± 22.02 g/d in the control group.

There was a 35% lower risk for major cardiovascular events among the subjects that consumed the largest amounts (highest tertile) of total olive oil intake in comparison with the lowest intake (hazard ratio [HR]: 0.65; 95% confidence interval [CI]: 0.47 to 0.89; P for trend = 0.01) and after cumulative adjustments for various factors (model 3). For every 10 g/day of total olive oil intake, there was a 16% (HR: 0.84; 95% CI: 0.73 to 0.96) decreased risk for cardiovascular mortality. Similarly, after adjusting for potential confounders, subjects in the highest tertile of baseline EVOO intake had a 39% lower risk for cardiovascular events compared to those consuming the lowest amounts (HR: 0.61; 95% CI: 0.44 to 0.85; P for trend < 0.01). In contrast, a non-significant inverse association was found between baseline EVOO consumption and mortality, especially all-cause mortality. Non-significant associations were found between the baseline intake of common olive oil and major cardiovascular events, as well as all causes evaluated for mortality. Overall, there were no significant associations found for cancer mortality and all-cause mortality of any group consuming high amounts of olive oil (EVOO, common, or both).

Evaluation of the different intervention groups and total olive oil intake indicated that the reductions in risk of major cardiovascular events were 57% (HR: 0.43; 95% CI: 0.25 to 0.75; P for trend < 0.01) and 55% (HR: 0.45; 95% CI: 0.25 to 0.82; P for trend < 0.01) for the MedDiet supplemented with either EVOO or nuts, respectively. In the low-fat diet control group, the risk was increased by 9% (HR: 1.09; 95% CI: 0.63 to 1.88; P for trend = 0.24).

The authors conclude, "Olive oil consumption, specifically the extra-virgin variety, is associated with reduced risks of cardiovascular disease and mortality in individuals at high cardiovascular risk." This study focused on an elderly Mediterranean population, which may not necessarily be extrapolated to non-Mediterranean populations consuming the MedDiet. Nevertheless, this study is one of several studies that has demonstrated the beneficial effects of the MedDiet, or its major components, for cardiovascular

health.[1-4]

—Laura M. Bystrom, PhD

References

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