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Olive Oil Continues to Show Promise for Bone Health

By Greg Arnold, DC, CSCS, September 20, 2010, abstracted from "Oleuropein enhances osteoblastogenesis and inhibits adipogenesis: the effect on differentiation in stem cells derived from bone marrow" printed online May 21, 2010 in Osteoporosis International

<http://www.nowfoods.com/BasicArticles/080634.htm>

As a cornerstone of the Mediterranean Diet whose health benefits "can help protect against heart disease, diabetes, cancer – even help with weight loss" (1), olive oil's high levels of antioxidants called polyphenols (2) have been shown to help maintain cell health (3) and digestive health (4) as well as producing "a protective effect" again cardiovascular disease risk factors (5).

Olive oil's role in bone health has been explored in mouse studies where oleuropein, an antioxidant in olive oil, produced a "bone sparing effect" in the mice ranging in doses from 2.5 to 15 mg per kg of bodyweight per day for 3 months (6). Now a new study (7), this time on human bone marrow, has continued to show potential for olive oil to help maintain bone health and potentially a big benefit in helping prevent osteoporosis which cost our healthcare system \$17 billion in 2001, affects 10 million Americans, with another 34 million at risk (8).

In the study, researchers took human stem cells from bone marrow and exposed them to either no amounts of oleuropein or [10-4, 10-5 and 10-6 Molar] for 21 days. The researchers measured the ability of these stem cells, when exposed to oleuropein, to develop into bone-making or fat-making cells since a characteristic of bone marrow during osteoporosis is a decrease in bone-making cells (called osteoblasts) coupled with an increase in fat-making cells (called adipocytes) (9).

By the end of 21 days, the researchers found cells exposed to [10-5 and 10-6] oleuropein had an increased ratio of 2 genes (OPG/RANKL) by 100% and 150%, respectively, marking a significant increase in bone-making activity (10) (no improvement was seen at [10-4 M dose]). Regarding fat cell development, there was an immediate inhibition of activity of a gene called PPAR γ 2, a main gene for fat cell development (11), "from the first moment of oleuropein treatment" for all 3 doses. For activity of another fat cell gene called FABP4 (12), activity decreased by as much as 90% when exposed to [10-5 and 10-6] oleuropein and decreased by 50% at [10-4].

Although the levels of Oleuropein used in the study are significantly higher than those which can be achieved through normal use of olives and olive oil, the researchers went on to conclude that, "taken together, these data suggest that the intake of oleuropein, highly abundant in olive tree products included in the traditional Mediterranean diet, could prevent age-related bone loss and osteoporosis."

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