The effect of chronic quercetin supplementation on bone health in postmenopausal women: A double-blind placebo-controlled investigation

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Abstract: Currently, there is limited research investigating the effects of quercetin on bone turnover and density. Therefore, this study aimed to examine the efficacy of 90-day quercetin supplementation on bone turnover, inflammation, body composition, and physical function in postmenopausal women. Thirty-four healthy postmenopausal women (59.2 ± 7.0 yrs, 80.7 ± 15.6 kg, 29.8 ± 6.1 $kg \cdot m^2$) participated in the double-blind placebo-controlled investigation. Participants were randomly assigned to one of two groups: 500 mg of Q or 500 mg of fiber (placebo; PLB). Data collected during the pre-and post-supplementation assessments included: bone turnover (osteocalcin, P1NP, CTX), inflammation markers (IL-6, TNF-alpha, CRP), body composition, dominant handgrip strength, and timed up and go test. Independent samples t-tests were used for between-group comparisons of baseline values and the percent change for each dependent variable. A significant difference in percent change for osteocalcin (Q: 20.5±25.7; PLB: 1.3±17.2; p=0.016; d=0.89), P1NP (Q: 28.9 (6.0–57.3); PLB: 4.6 (-7.6 – 8.5); p=0.030; d=0.64), and CTX (Q: 39.0 (-10.0 – 84.6); PLB: -7.74 (-28.9 – 18.5); p=0.023; d=0.91) was found between Q and PLB, with greater increases in Q. Changes in the inflammation markers IL-6 (Q: -17.6±24.1; PLB: 2.90±31.1; p=0.045; d=0.73) and TNF-alpha (Q: -4.9± (-15.3 – [-3.2]); PLB: 1.9 (-7.8 – 4.0); p=0.021; d=0.90) between the two groups were significant. No significant changes were found between groups for CRP, body composition, and physical function (p>0.05). The data suggest that Q may improve bone health status in postmenopausal women through its ability to decrease pro-inflammatory mediators and increase turnover markers.

Keywords: quercetin, bone health, postmenopausal women, bone turnover, inflammation