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2 **ABSTRACT : Association of the Dietary Inflammatory Index to Bone Mineral Density and**
3 **Fracture Risk in the Women's Health Initiative**

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18 **Background:** Previous studies suggest that bone loss and fracture risk are associated with a
19 higher inflammatory milieu, and that diet may modulate inflammation.

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21 **Objective:** Evaluate the association of the inflammatory potential of diet, as measured by the
22 Dietary Inflammatory Index (DII), with changes in bone mineral density (BMD) and fracture risk
23 in postmenopausal women.

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25 **Design:** DII scores were calculated from baseline food frequency questionnaires (FFQ) of
26 161,595 participants of the Women's Health Initiative. Year 3 FFQs were used to calculate a DII
27 change score. BMD measurements (dual-energy X-ray absorptiometry) from baseline, year 3
28 and 6 were analyzed in a sub-group of women (n=10,290). Fractures were reported at least
29 annually; hip fractures were confirmed by medical records. Changes in hip BMD were analyzed
30 by pair-wise comparisons by quartile (Q1 = referent, most anti-inflammatory diet) of baseline DII
31 scores. Hazard ratios for fractures were computed using multivariate-adjusted Cox proportional
32 hazard models.

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34 **Results:** After multivariate adjustment, women with the most anti-inflammatory DII score had
35 less loss of hip BMD (p=0.01) by year 6, despite lower baseline hip BMD. DII score improved
36 significantly over three years (mean change: - 0.4 ± 2.4; p <0.01), but change was not
37 associated with fracture risk at any site. No significant associations were found between
38 baseline DII score and hip fracture risk (HR Q4: 1.02; 95% CI 0.92, 1.14; p=0.71).
39 Unexpectedly, women with the most pro-inflammatory DII-scores had slightly lower risk for total
40 fractures (HR Q4: 0.95; 95% CI 0.92 0.98; p<0.01) and lower-arm fractures (HR Q4: 0.92; 95%
41 CI 0.86-0.98; p=0.02); however, after stratification by calcium intake, the association remained
42 significant only for lower arm fractures in women consuming >1200 mg calcium/day.

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44 **Conclusion:** An anti-inflammatory dietary pattern was associated with less BMD loss in
45 postmenopausal women, but this did not translate into reduced fracture risk during six years of
46 follow-up.

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