

TEA POLYPHENOLS MITIGATE SKELETAL FLUOROSIS WITH OSTEOSCLEROSIS IN C57BL/6 MICE

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SUMMARY: Tea polyphenols (TP) have received considerable attention because of their inoxidizability and the possibility that they may exert beneficial effects on maintaining bone mass. However, few studies provide direct evidence on the question of whether or not TP affect the development of osteosclerosis and the possible mechanisms involved. A 15-week study, based on a 2 (distilled water vs. 100 ppm fluoride) × 2 (no TP vs. 1% TP in drinking water) factorial design, was performed to study the effects of fluoride (F) and/or TP on bone resorption in C57BL/6 mice and the mechanisms involved. Bone F was determined by the ion selective electrode method. Efficacy was evaluated by examining changes in dental fluorosis using diagnostic criteria, skeletal fluorosis using a digital X-Ray specimen system, TRAP⁺ cells *in vivo* using histomorphometry, and osteoclast microstructure using transmission electron microscopy (TEM). Malondialdehyde (MDA) in serum was detected by the thiobarbituric acid (TBA) method. The results showed that F led to an increase in dental fluorosis, bone mass, and serum MDA level, and that TP supplementation could reduce the occurrence of these effects. Although F and/or TP increased the number of osteoclasts, F inhibited the formation of special structure in the osteoclasts and the TP served a protective role. We concluded that drinking water supplemented with TP protected osteoclasts from injury and inhibited the increase of bone mass in a chronic fluorosis model in C57BL/6 mice by reducing oxidative stress.

Keywords: Fluorosis; Malondialdehyde; Osteosclerosis; Oxidative stress; Tea polyphenols; Water supplementation with TP.

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