Preventive Effect of Soy Isoflavones on Cadmium-induced Bone Loss

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Cadmium is known as a toxic heavy metal whose exposure to both humans and animals can cause adverse health effects leading to itai-itai disease. We investigated the preventive ability of genistein, daidzein to cadmium(Cd)-induced bone loss for 8 weeks. Fifty four, 4-week-old Wistar female rats were ovariectomized and divided into one ovariectomized (OVX) group and 5 Cd(50 ppm) treated ovariectomized groups: OVX+Cd, OVX+Cd+genistein (G; 10μg/g b.w.), OVX+Cd+daidzein (D; 10μg/g b.w.), and OVX+Cd+17 β-estradiol(ES; 10μg/kg b.w.). Femur weight was heavier in OVX+Cd+G, D, ES than in OVX+Cd. Femur breaking force, length, volume and Ca contents as well as fecal Cd excretion were improved by feeding genistein and 17 β-estradiol. Serum ALP level was lower in OVX+Cd than in other groups. Histopathology in femur was analyzed by H&E staining. Femur epiphyseal plate was thicker and its mineral density was more compact in genistein and estradiol groups than other groups. Therefore, genistein may decrease bone loss in Cd-exposed ovariectomized rats.