“The Effects of Native and Synthetic Estrogenic Compounds as well as Vitamin D Less-calcemic Analogs on Adipocytes Content in Rat Bone Marrow”

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Abstract

Background: We demonstrated previously that phytoestrogens and vitamin D analogs like estradiol-17beta (E2) modulate bone morphology in rat female model. Aim: We now analyze the effects of phytoestrogens, E2, SERMs and the lesscalcemic analogs of vitamin D: JKF1624F2-2 (JKF) or QW1624F2-2 (QW) on fat content in bone marrow (BM) from long bones in ovariectomized female rats (OVX).

Materials and Methods: OVX rats were injected with treatments known to affect bone formation, 5 days per week for 2.5 month for analysis of fat content in BM.

Results: In OVX young adults there is a decreased bone formation and a 10 folds increase in fat cells content in BM. Treatment with E2, raloxifene (Ral) or Femarelle (DT56a) resulted in almost completely abolishment of fat cells content. Daidzein (D) decreased fat cells content by 80%, genistein (G) or biochainin A (BA) did not change fat cells content and carboxy BA (cBA) had a small but significant effect. JKF or QW did not affect fat cells content, whereas combined treatment of JKF or QW with E2 resulted in complete abolishment of fat cells content. These changes in fat cells content are inversely correlated with changes in bone formation.

Conclusions: Our results demonstrate that adipogenesis induced by OVX is a reversible process corrected by hormonal treatments. The awareness of a relationship between fat and bone at the marrow level might provide a better understanding of the pathophysiology of bone-loss as well as a novel approach to diagnosis and treatment of post-menopausal osteoporosis.