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New aspects of Ferutinin effect in preventing osteoporosis

Marzia Ferretti¹, Francesco Cavani¹, Laura Bertoni¹, Manuela Zavatti¹, Angelo P. Taronna¹, Gianluca Carnevale², Augusta Benelli¹, Paola Zanoli², Gastone Marotti¹ and Carla Palumbo¹

¹ Dipartimento Anatomia e Istologia (Sez. Anatomia), Università Modena e RE, Italy

² Dipartimento Scienze Biomediche, Università Modena e RE, Italy

The aim of this study was to analyse, with respect to previous studies, the role of the phytoestrogen Ferutinin in avoiding bone loss due to estrogen deficiency. The protocol included 30 female 7 week-old Sprague Dawley rats, divided into 6 groups of 5 rats each: 1) Sham-operated controls (SHAM), 2) OVX controls (C-OVX), 3) OVX treated with ferutinin (F-OVX) 0.5mg/Kg/day, 4) F-OVX 1mg/Kg/day, 5) F-OVX 2mg/Kg/day, 6) OVX treated with estradiol benzoate (EB-OVX) 1.5 µg/rat twice a week. The treatments started the day after the ovariectomy and lasted for 30 days. Tetracycline double labelling was performed 20 and 5 days before sacrifice. Histomorphometrical analyses were performed on trabecular bone of the 4th/5th lumbar vertebrae and distal femoral epiphyses, as well as on cortical bone of vertebral bodies and femoral diaphyses. At the end of the treatments very low ponderal increments were recorded in all F-OVX groups (2-4%) with respect to SHAM/EB-OVX (10%) and C-OVX (30%). Although the great ponderal differences between all F-OVX groups and C-OVX that should imply a decrease of bone mass in F-OVX groups, trabecular bone volume (BV/TV) in lumbar vertebrae didn't show significant differences, suggesting that ferutinin, opposing estrogen deficiency, inhibits osteoclast activity. Bone areas of cortical bone measured between double labels were always low in all F-OVX groups and high in C-OVX group with respect to all the others, suggesting that these skeletal regions are mainly devoted in answering the mechanical demands. On the contrary BV/TV of femoral distal epiphyses resulted lower in C-OVX with respect to all other groups, suggesting that they are mainly devoted in answering the metabolic demands. This agrees with urinary DPD (an osteoclast activity marker) whose levels are significantly higher in C-OVX with respect to all other groups. In conclusion, our results suggest that ferutinin role, in preventing osteoporosis, due to estrogen deficiency, is expressed in inhibiting osteoclast erosion rather than in enhancing osteoblast deposition (as previously suggested); moreover, in all F-OVX groups the bone turnover is very low and seems correlated to the trivial body weight increase, which, in turn, depends on ferutinin treatment.