conferenceseries.com

Beata Znorko et al., J Nephrol Ther 2016, 6:5(Suppl)
http://dx.doi.org/10.4172/2161-0959.C1.030

The opposite effect of the OPG/RANKL system on bone strength in growing rats with experimental chronic renal failure

Beata Znorko, Ewa Oksztulska Kolanek, Tomasz Domaniewski, Alicja Roszczenko, Joanna Rogalska, Malgorzata Michalina Brzoska, Dariusz Pawlak and **Krystyna Pawlak**
Medical University of Bialystok, Poland

Chronic kidney disease-mineral and bone disorders (CKD-MBD) are common during the course of CKD and related to disturbances in bone strength and metabolism. Recent research shows that the osteoprotegerin (OPG) and receptor activator of NF-κB ligand (RANKL) play a significant role in the development of CKD-MBD. The aim of the study was to investigate if the OPG/RANKL system affects biomechanical properties in young, growing rats with experimental model of chronic renal failure (CRF). The animals were divided into 2 groups: Sham-operated and subtotal nephrectomized rats. Left femurs were excised 1 and 3 months after nephrectomy for determination of biomechanical properties: Three-point-bending test in femoral diaphysis and bending test in femoral neck. Soluble RANKL (sRANKL) and OPG were measured in homogenates from trabecular and cortical bone tissue. Trabecular and cortical OPG were increased in CRF in comparison to control 3 months after surgery, whereas trabecular sRANKL was increased 1 month after nephrectomy. At the level of femoral neck, OPG in trabecular bone tissue correlated positively with stiffness (r=0.539, p=0.017) and ultimate load (Fu) (r=0.611, p=0.05), and inversely with work to fracture (W) (r=-0.465, p=0.044). sRANKL in both trabecular and cortical bone tissue was positively correlated with W (r=0.648, p=0.01; r=0.420; p=0.05, respectively) and inversely with stiffness (r=0.474, p=0.026). At the level of femoral diaphysis, sRANKL was inversely associated with Fu (r=-0.503, p=0.017) and there were no associations between cortical OPG levels and these parameters in both femoral neck and diaphysis. In young, rapidly growing rats OPG and sRANKL exerts opposite effect on biomechanical bone strength in experimental CRF.

Biography

Beata Znorko has completed Master's degree in Laboratory Medicine in 2013 at Medical University of Bialystok. Currently she is PhD student at Faculty of Pharmacy with the Division of Laboratory Medicine at Medical University of Bialystok. She is Head of the project funded by National Science Centre Poland entitled: Osteoprotegerin- Ally or Enemy of Blood Vessels Calcification in the Experimental Model of Chronic Kidney Disease in Rat? and Molecular Mechanisms of Vascular Calcification in Chronic Kidney Disease as a Link between Bone and Vasculature' funded by KNOW, The Leading National Research Centre and The Centre for Innovative Research (CIR).

beataznorko@gmail.com

Notes: