Impact of Cystinosis on Bone Health

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The specific bone abnormalities in patients with chronic kidney disease are defined as renal osteodystrophy (ROD) diagnosed only by bone biopsy and affects virtually all adult and pediatric patients with chronic kidney disease (CKD). Nephropathic cystinosis is a lysosomal storage disorder characterized by Fanconi syndrome that evolves to CKD. The frequency and severity of bone disorders in such disorder have been characterized by skeletal deformities, vertebral fractures, decreased bone mass. Compared to non-cystinosis age-matched CKD patients, we demonstrated that the abnormalities of mineral metabolism differed, and serum phosphate levels is one of the key regulators. Furthermore, bone biopsies performed in such patients have a greater degree of a mineralization defect when compared to CKD patients without cystinosis.

To further assess the impact of cystinosis on bone health, we have developed a mouse model with wo different cystinosin gene mutations, like those found in patients. Preliminary results demonstrated a severe mineralization defect, which closely resembles the bone abnormalities observed in cystinosis patients. While these findings are still preliminary, further characterization of this defect will help us to identify different metabolic pathways and potentially reveal new treatment strategies. These findings will need to be confirmed using human bone samples cystinosis patients.