PAEDIATRIC NEPHROLOGY

Bone changes in children with chronic kidney disease

Children with chronic kidney disease (CKD) have progressive declines in cortical bone accrual over 1 year of follow-up, according to a recent study.

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“This article was motivated by two factors,” says author Mary Leonard. “First, it is well established that adults with CKD have significantly higher fracture rates than do healthy controls. Second, bone accrual during growth and development determine peak bone mass in young adulthood and may have lifelong implications for fracture risk. Our objective was to determine if CKD in childhood was associated with failure to accrue bone density and structure—that is, the dimensions of cortical bone.”

The study included 103 children and adolescents (aged 5–21 years) with CKD (estimated glomerular filtration rate <90 ml/min/1.73 m²). The researchers obtained quantitative CT scans from the left tibia at baseline and 1 year later. Data from the study population were compared with data from a reference population of 903 healthy children and adolescents.

Baseline Z scores for muscle area, cortical area, periosteal circumference and endosteal circumference were significantly

lower in individuals with CKD than in the reference cohort. Over 1 year of follow-up, cortical bone mineral density, cortical area and periosteal circumference Z scores all decreased in individuals with CKD. Elevated intact parathyroid hormone levels were associated with increases in trabecular bone mineral density Z scores and decreases in cortical bone mineral density in younger individuals (aged <14 years). Changes in muscle and bone accrual were positively associated in the healthy controls but not in children and adolescents with CKD.

The researchers are conducting a number of other studies with the aim of ultimately identifying an intervention that could promote bone accrual in children with CKD.

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Original article Tsampalieros, A. *et al.* Changes in bone structure and the muscle–bone unit in children with chronic kidney disease. *Kidney Int.* doi:10.1038/ki.2012.347