

KSN 2017 Abstract

Lessons learned from the Chronic Kidney Disease in Children Study

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The Chronic Kidney Disease in Children (CKiD) Study is a prospective cohort study begun in January 2005. Initial eligibility criteria included age 1 to <16 years of age with estimated GFR between 30 and 90 ml/min/1.73 m² via the Schwartz formula at study entry. The study has enrolled 891 children, median age 11 years and median eGFR 42; 61% male 17% AA, 30% glomerular diagnosis, and 22% had uncontrolled BP. We have prospectively evaluated the prevalence of cardiovascular disease (CVD) risk factors, progression of chronic kidney disease (CKD), and cognitive development. CVD risk factors are highly prevalent including confirmed and masked HTN (18% and 38%), LVH 18%, dyslipidemia 60%. Using parametric failure time models we have characterized adjusted associations between baseline levels and changes of predictors and the time to the composite event of renal replacement therapy or halving of GFR. Of the cohort 29% of those with non-glomerular disease and 41% of those with glomerular disease progressed to the composite event after a median follow-up of 5.2 and 3.7 years. Among non-glomerular patients and after adjusting for baseline GFR, times to the composite event were significantly reduced with urine protein to creatinine ratio > 2 mg/mg, hypoalbuminemia, elevated blood pressure, dyslipidemia, male gender and anemia by 79%, 69%, 38%, 40%, 38% and 45%, respectively. Among glomerular patients, urine protein to creatinine > 0.5mg/mg, hypoalbuminemia and elevated blood pressure significantly reduced times to the composite event by 94%, 71% and 67%, respectively. Both Cox proportional hazards models with time-varying RAAS exposure and Cox marginal structural models (MSM) were used to evaluate the effect of RAAS use on time to RRT. Analyses were adjusted or weighted to control for age, male sex, glomerular diagnosis, GFR, nephrotic range proteinuria, anemia, elevated blood pressure, acidosis, elevated phosphate and elevated potassium. RAAS use was found to reduce the risk of RRT by 21% (hazard ratio: 0.79) to 37% (hazard ratio: 0.63) from standard regression adjustment models and MSM models, respectively. With regard to neurocognitive performance, data from the CKiD Study indicate that a subset of children with CKD have unsuspected genomic disorders that predispose them to organ malformations and neurocognitive impairment. Compared with noncarriers, children with genomic disorders scored significantly poorer on all measures of intelligence, anxiety/depressive symptoms, and executive function (differences of 0.6–0.7 SD; P=1.231023–2.431024).