

1. Outcome of Patients Initiating Chronic Peritoneal Dialysis During the First Year of Life.

Carey WA, Martz KL, Warady BA.
Pediatrics. 2015;136(3):e615-22.

BACKGROUND AND OBJECTIVE: Among children with end-stage renal disease (ESRD), those who abstract initiated chronic dialysis during the first year of life historically were less likely to survive or receive a kidney transplant compared with those who initiated dialysis later in childhood. We hypothesized that recently treated infants have experienced improved outcomes.

METHODS: We queried the North American Pediatric Renal Trials and Collaborative Studies database, obtaining information on 628 children who initiated maintenance peritoneal dialysis for treatment of ESRD at ,1 year of age. We further subcategorized these children by age (neonates, #31 days and infants, 32–365 days) and date of dialysis initiation (past, 1992–1999, and recent, 2000–2012).

RESULTS: Survival while on dialysis and overall survival were significantly better among neonates and infants in the recent cohort. Overall survival at 3 years after dialysis initiation was 78.6% and 84.6% among the recently treated neonates and infants, respectively. Neonates and infants in the recent cohort also were more likely to terminate dialysis for transplantation, and graft survival was improved among recently transplanted infants (3-year graft survival 92.1%).

CONCLUSIONS: Among children who initiate chronic peritoneal dialysis for treatment of ESRD in the first year of life, survival has improved in recent years. Graft survival also has improved for the subset of these patients who received a kidney transplant.

2. (R)evolution in the Management of Acute Kidney Injury in Newborns.

Ronco C, Ricci Z, Goldstein SL.
Am J Kidney Dis. 2015;66(2):206-11

The application of continuous renal replacement therapy (CRRT) in children, before roller pumps and dialysis monitors were available in the intensive care unit, was realized by continuous arteriovenous hemofiltration. Then hemofiltration was coupled with dialysis in order to increase dialytic dose and system efficiency, and the circuit and filters were

specifically modified to optimize patency and session life span. After about 30 years, another revolution is ongoing, in that pediatric acute kidney injury (AKI) and fluid accumulation (for which critically ill newborns and children with multiple-organ dysfunction are greatly at risk) are recognized as independently associated with mortality and identified as primary conditions to prevent and aggressively treat. Today, novel technology specifically dedicated for very young patients will allow feasible and straightforward application of CRRT to infants and children. This article discusses the authors' personal perspectives on how clinical and technical issues of dialysis in children have been addressed and how today, severe pediatric AKI can be managed with accurate and safe CRRT machines that will likely yield outcome improvements in the coming decades.

Also see:

Continuous renal replacement therapy in neonates and small infants: development and first-in-human use of a miniaturised machine (CARPEDIEM).

Ronco C, et al, Lancet. 2014;383(9931):1807-13.

Comments

Papers included in this month's Journal Club are selected for their practical relevance in routine nephrology practice, with a particular focus on the management of neonates with AKI, and the long-term prognosis of neonatal ESRD. Survival has improved in neonates and infants on chronic PD, with approximately 80% 3-year survival after dialysis initiation.

The second paper presents the CARPEDIEM for extra-corporeal therapy in neonates and infants.