Treatment and Outcomes for End-Stage Renal Disease Following Wilms Tumor

May 21, 2012

C Mason

Wilms tumor (WT), also known as nephroblastoma, is a cancer of the kidneys that is diagnosed predominantly in young children. Although five year survival rates are consistently above 90%, the disease and its treatment may continue to adversely affect the quality of life among survivors. Most notably, end-stage renal disease (ESRD), the incidence of which varies considerably across patient subgroups (0.6-90%), is one of the most serious late-effects due to its high mortality rate and cardiovascular damage, as well as impaired cognitive development and growth retardation associated with long-term dialysis.

Pediatric patients with ESRD have high priority for renal transplantation, but the procedure is typically delayed for one to two years following treatment for WT because of deaths and tumor recurrences reported in early studies. Yet, in light of the advances in preventing and treating acute graft rejection and in dealing with immunosuppression, Dr. Yevgeny Grigoriev and several colleagues from the Public Health Sciences Division recently investigated the timing of kidney transplantation in relation to WT treatment in order to determine whether the recommended waiting time remains appropriate.

Specifically, Grigoriev examined time-to-transplant and survival outcomes in 173 children enrolled in the National Wilms Tumor Study who received kidney replacement therapy (dialysis or renal transplant) for ERSD and compared their outcomes to a random age-matched population sample with ERSD from the U.S. Renal Data System.

Fifty five patients with progressive bilateral Wilms tumor developed ESRD with the surgical removal of all kidney tissue and experienced high early mortality after chemotherapy which limited their opportunity for transplant (47% at 5 years) and survival (44% at 10 years). In contrast, 118 patients whose ESRD resulted from chronic kidney disease that developed from a variety of causes, had good opportunity for transplant (66% within 2 years; 77% at 5 years) and survival outcomes no worse than the population controls (73% at 10 years). However, once a transplant had been performed, the differences in outcomes between groups were markedly reduced. The authors also noted that minority children had twice the median time to transplant as non-Hispanic white patients (3.1 years vs. 1.5 years) and higher mortality rates, consistent with population trends.

Relative to patients who received a transplant more than two years after WT treatment, the hazard ratios for death following transplant were 0.9 (95% Confidence Interval (CI): 0.3-3.3) and 0.6 (95% CI: 0.1-2.6) for transplants occurring less than one year and one to two years after chemotherapy, respectively.

Given that none of the study results suggested a markedly adverse prognosis associated with early transplantation, and because of the dramatic improvement in outlook following kidney transplantation, the authors believe that re-evaluation of the current recommendation for a two year delay in transplant following treatment for Wilms tumor may be warranted.

Grigoriev Y, Lange J, Peterson SM, Takashima JR, Ritchey ML, Ko D, Feusner JH, Shamberger RC, Green DM, Breslow NE. 2012. Treatments and outcomes for end-stage renal disease following Wilms tumor. *Pediatric Nephrology*, Epub ahead of print, doi: 10.1007/s00467-012-2140-x.

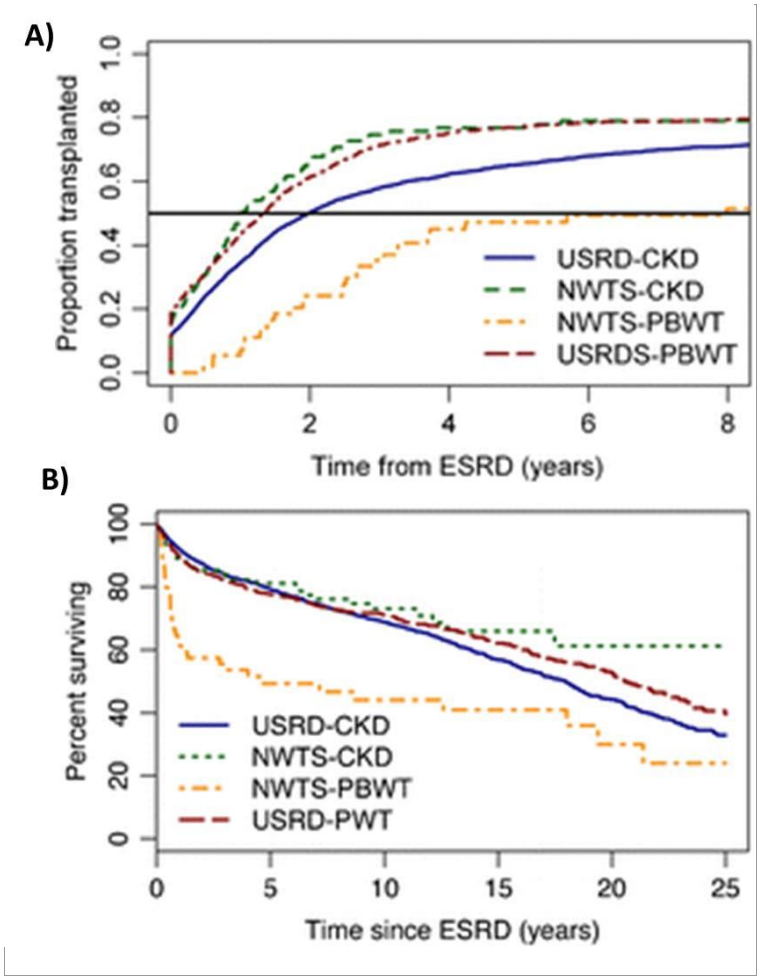

Image courtesy of the author

Figure. A) Cumulative incidence curves showing proportions of patients who received an initial transplant by time since onset of end-stage renal disease (ESRD); B) Survival curves (proportions of surviving patients) by time since onset of ESRD for four groups. NWTS-CKD and NWTS-PBWT refer to National Wilms Tumor Study (NWTS) patients whose ESRD was due to progressive bilateral Wilms tumor (PBWT) and chronic kidney disease (CKD), respectively. USRD-PBWT and USRD-CKD refer to stratified samples of USRDS (United States Renal Data System) patients that were frequency-matched on age at ESRD onset to the corresponding NWTS populations.