Findings

Higher BUN Linked to Higher Incidence of Diabetes

Elevated blood urea nitrogen (BUN) levels are associated with an increased risk of developing diabetes, according to a study in Kidney International.

The researchers analyzed a national cohort of more than 1.3 million US veterans enrolled in the VA Health Care System. All patients were initially free of diabetes. At the time of cohort entry, 8.77% of individuals had an elevated BUN level of greater than 25 mg/dL. Risk of incident diabetes associated with BUN was assessed over a median follow-up of nearly 5 years, including joint risk models of estimated glomerular filtration rate (eGFR) and BUN.

Among patients with a BUN level of 25 mg/dL or less, there was no association between eGFR and incident diabetes. However, an elevated BUN of 25 mg/dL or higher was significantly associated with diabetes, even in those with eGFR of 60 mL/min/1.73 m²; hazard ratio (HR) 1.27. For patients with elevated BUN and eGFR of less than 15 mL/min/1.73 m², the HR increased to 1.68.

Diabetes risk increased progressively with BUN level on spline analysis. In analyses considering eGFR as a continuous covariate, elevated BUN was associated with an increased risk of diabetes, HR 1.23; while eGFR was not related to incident diabetes. In two-stage residual inclusion analyses, each 10 mg/dL increase in BUN was associated with an increase in diabetes risk.

Previous reports linked higher urea levels to increased insulin resistance and suppressed insulin secretion. The new study demonstrates a significant increase in diabetes incidence in veterans with elevated BUN levels, independent of eGFR. The results suggest a bidirectional relationship between diabetes and kidney disease: in addition to the known increase in kidney disease risk associated with diabetes, urea may be associated with increased diabetes risk [Xie Y, et al. Higher blood urea nitrogen is associated with increased risk of incident diabetes mellitus. Kidney Int 2017; DOI: 10.1016/j.kint.2017.08.033].

Longer Time on Dialysis Linked to Increased Transplant Failure

For non-preemptive living donor kidney transplant recipients, longer pretransplant dialysis exposure is associated with a higher risk of allotraft failure, reports a study in the American Journal of Kidney Disease.

The retrospective study included 77,607 adult, first-time, kidney-only living donor transplant recipients reported to the Scientific Registry of Transplant Recipients between 2000 and 2016. Of these, 51,390 underwent non-preemptive transplantation. Duration of pretransplant dialysis exposure was examined for association with kidney transplant failure from any cause including death. Median duration of dialysis exposure in the non-preemptive transplant group was 14 months.

Patients with longer pretransplant dialysis exposure were at higher risk of transplant failure. Compared to dialysis exposure of less than 3 months, hazard ratio for transplant failure from any cause increased from 1.16 for patients with 6 to 9 months of exposure to 1.60 for those with more than 60 months of exposure.

Time on dialysis varied considerably among transplant centers: median exposure was 11.0 months for centers in the 10th percentile versus 18.9 months for those in the 90th percentile. Pretransplant dialysis exposure was shorter at centers with higher proportions of living donor transplants.

Other factors associated with longer dialysis exposure were black race, low income, nonprivate insurance, less than high school education, and longer time not working for income. Even for patients with these characteristics, dialysis exposure varied between transplant centers.

The new results show that longer duration of dialysis before living donor kidney transplantation is associated with a higher risk of transplant failure from any cause. Duration of pretransplant dialysis exposure varies between centers and is associated with patient sociodemographic factors. “Strategies to increase the efficiency of living donor transplantation in non-preemptive recipients are warranted,” the researchers conclude [Gill JS, et al. Variation in dialysis exposure prior to nonpreemptive living donor kidney transplantation in the United States and its association with allotraft outcomes. Am J Kidney Dis 2017; DOI: https://doi.org/10.1053/j.ajkd.2017.11.012].

New Data on Long-Term Outcomes in Living Kidney Donors

At mid- to long-term follow-up, living kidney donors are at significantly increased risk of end stage renal disease (ESRD) and preeclampsia, concludes a meta-analysis in the Annals of Internal Medicine.

A systematic review identified 52 observational studies comparing a broad range of health outcomes in living kidney donors, with follow-up of 1 to 24 years. Meta-analysis included 118,426 living kidney donors and 117,656 controls.

The data showed no significant difference in all-cause mortality for living kidney donors compared to nondonors. Several other outcomes of concern were also similar between groups, including cardiovascular disease, hypertension, and type 2 diabetes. Health-related quality of life scores, including physical and mental health components, were comparable as well. Some evidence suggested a higher vitality score in donors versus controls.

Living kidney donation was associated with higher mean diastolic blood pressure and lower mean estimated glomerular filtration rate. Living donors were more likely to develop ESRD: incidence rate 0.5 versus 0.1 per 1000 person-years, relative risk (RR) 8.8. Female donors were at increased risk for preeclampsia: incidence rate 5.9 versus 3.1 per 100 pregnancies, RR 2.12.

Questions remain as to the long-term impact of living kidney donation on donor health and well-being. The new meta-analysis, including data on nearly 120,000 living kidney donors, finds increased relative risks of ESRD and preeclampsia, although the absolute risks are low.


Better Outcomes for ESRD Resulting from Granulomatosis with Polyangiitis

Since the 1990s, the risk of death has decreased for patients with end stage renal disease due to granulomatosis with polyangiitis (GPA-ESRD), reports a study in Arthritis Care & Research.

From the US Renal Data System, the researchers identified 5929 patients diagnosed with GPA-ESRD between 1995 and 2014, representing nearly all incident cases during that time. Trends in overall and cause-specific mortality were analyzed in subgroups of patients defined by year of ESRD onset: 1995–99, 2000–04, 2005–09, and 2010–14. The overall incidence of GPA-ESRD per million population increased from 0.81 in 1995–99 to 1.15 in 2005–09, stabilizing at 1.12 in 2010–14.

Mortality per 100 patient-years decreased throughout the period studied: from 19.0 in 1995–99, to 16.9 in 2000–04, to 16.2 in 2005–09, to 15.3 in 2010–14. The adjusted hazard ratio for death in the 2010–14 cohort was 0.77, compared to the 1995–99 cohort. The improvement in overall mortality was unaffected by further adjustment for body mass index, smoking, comorbid conditions, region, and initial ESRD therapy modality. On analysis accounting for competing risks, HRs were 0.61 for death from cardiovascular disease and 0.42 for death from infection.

Patients with GPA are at risk of kidney involvement leading to ESRD. The new study is the first to analyze US national trends in the incidence and mortality of GPA-ESRD.

The results show significant improvements in overall and cause-specific mortality from GPA-ESRD over the past two decades. While the specific factors responsible for gains cannot be identified, the findings “likely reflect improved management of both GPA and ESRD,” the researchers write [Walczak ZS, et al. Improving mortality in end-stage renal disease due to granulomatosis with polyangiitis from 1995 to 2014. Arthritis Care Res (Hoboken) 2018; DOI: 10.1002acr.23521].