Elevated nighttime blood pressure may be a warning sign that a child with kidney disease is at risk of faster progression, according to an abstract presented at Kidney Week.

Hypertension is a risk factor for kidney disease, and is linked to faster progression. Typically, physicians monitor blood pressure with readings during clinic visits. However, use of 24-hour ambulatory blood pressure monitoring is increasing, and emerging data suggest that high nighttime blood pressure may be a particularly important risk factor in kidney disease. For example, a recent study in adults with kidney disease suggested that elevated nighttime blood pressure may lead to worse organ damage (Wang C, et al. *PLoS One* 2015; 10:e0131546).

Now, Mónica Guzmán-Limón, MD, a nephrology and hypertension fellow at the McGovern Medical School at the University of Texas Health Science Center, and her colleagues show that nighttime hypertension is also an important risk factor for children with CKD. They analyzed results from 1195 24-hour blood pressure recordings across five sites with the Chronic Kidney Disease in Children (CKiD) study. Children who had normal blood pressure around the clock had the fastest progression. For children with nonglomerular kidney disease, high nocturnal blood pressure was associated with worsening outcome with a Hazard Ratio (HR) of 1.80 compared to normotensive children (p=0.02), and those who had high blood pressure around the clock had a HR of 2.37 (p=0.001).


The findings confirm the baseline data out of the CKiD study that nocturnal hypertension is more common than daytime hypertension, said Janis Dionne, MD, a clinical associate professor and pediatric nephrologist at the University of British Columbia, and show that having both high daytime and nighttime blood pressure is most strongly linked to the risk of progression.

"It reinforces that we need to use [24-hour ambulatory blood pressure monitoring] in pediatric hypertension and pediatric kidney disease," Dionne said. But she noted that payers poorly reimburse such monitoring, if it is reimbursed at all.

"Physicians need to advocate to get them done in their patients," she said.

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**Elevated Blood Pressure, Poorer Renal Function Seen in Teens Born Prematurely**

By Bridget M. Kuehn

By adolescence, individuals who were born prematurely and low birth weight are already showing signs of kidney impairment, according to an abstract presented at Kidney Week.

Improved care in the neonatal intensive care unit has allowed many babies born prematurely to survive and thrive into adulthood. But some evidence has emerged that individuals who were born prematurely have an increased risk of developing chronic kidney disease later in life (Carmody JB and Charlton JR. *Pediatrics* 2013; 131:e1168-1179).

"There is a growing recognition that individuals born preterm are vulnerable to renal disease," said Jennifer Charlton, MD, a pediatric nephrologist and associate professor at the University of Virginia Health System in Charlottesville.

It’s not clear why, said abstract co-author Andrew South, MD, MS, assistant professor of pediatric nephrology at Wake Forest School of Medicine, but animal studies suggest that individuals born prematurely may not have a full complement of nephrons at birth.

"The nephrons, they do have to work harder and burn out sooner," he suggested. But it has been difficult to prove this hypothesis because it would be unethical to take kidney biopsies from healthy children.

So South and his colleagues have launched a study that will follow a cohort of adolescents (96 born prematurely and 43 born at term) to track kidney function over time non-invasively. In the abstract, they present results of measurements of blood pressure and kidney function at age 14. The results show that the former preemies have higher mean systolic (p< 0.01) and diastolic blood pressure (p<0.03) than the controls. They have significantly lower glomerular filtration rates (GFR) compared with the control group (β: -8.17 mL/min/1.73 m², 95% CI -15.93 to -0.4). The former preemies also had higher albumin.

The findings suggest that those born prematurely are already beginning to experience a decline in kidney function by early adolescence.

"It’s an early indication those kidneys are working too hard," said South. He and his colleagues will continue to follow this cohort and assess their kidney function again at 19 and 24 years of age.

Adjusting for confounders reduced the differences between the two groups.

"It is wonderful that investigators are focusing research efforts on this understudied population," Charlton said. "Although their results were attenuated by adjustments for various confounders, their unadjusted results suggest higher blood pressure and lower renal function in the preterm group.

The results suggest that clinicians should carefully monitor kidney function in patients who were born prematurely, South said. By identifying kidney decline early, physicians may have an opportunity to prevent or delay progression.

"It suggests you could potentially intervene with drugs or other practices," he said.

Many questions remain to be answered such as when and how to follow these patients and educate their families, Charlton noted. Also, it is not clear whether acute kidney injury might contribute to the development of CKD in former preemies, whether these individuals have progressive disease, and what the long-term health consequences of mildly impaired GFR are.

"In my opinion, we are just beginning a fascinating journey to discover how renal health is affected by preterm birth," Charlton said.

"Renal Function and Blood Pressure in Adolescents Born Preterm and Very Low Birth Weight" (Poster 663)