

New clinical equation accurately measures kidney function in children

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Measuring a child's kidney function has traditionally been time-consuming, costly, and difficult to perform, but a new equation that uses parameters collected at routine office visits can effectively accomplish this, according to a study appearing in the March 2009 issue of the *Journal of the American Society Nephrology (JASN)*. The formula could prove useful for measuring kidney function when young patients are given antibiotics, chemotherapy, and other drugs that could potentially injure the kidneys. The equation could also be valuable for monitoring kidney function in children with kidney disease.

Glomerular filtration rate (GFR)—the flow rate of filtered fluid through the kidney—is the most useful indicator of kidney function and kidney disease progression, but it is often difficult to measure in children. Therefore, researchers have been looking for improved ways to estimate GFR using clinical measurements that can be obtained during routine medical visits.

George Schwartz, MD, FASN of the University of Rochester Medical Center in Rochester, New York, along with his colleagues (Alvaro Munoz, PhD; Michael Schneider, MS; Robert Mak, MD, PhD; Frederick Kaskel, MD, PhD, FASN; Brad Warady, MD; and Susan Furth, MD, PhD) in the Chronic Kidney Disease in Children Cohort Study (CKID) developed a formula to estimate GFR using demographic variables, such as sex and height, and biochemical markers of kidney function that can easily be measured in the clinic. These include measures of creatinine (a waste product of muscle metabolism), cystatin C (a ubiquitously

expressed small protein), and blood urea nitrogen (nitrogen in the form of urea), all of which are filtered by the kidney.

The investigators found that their formula was comparable with other more complicated tests such as those using the radiocontrast agent iohexol. The researchers also noted that in a group of 168 children with chronic kidney disease, their equation was superior to other recently published equations that have been used to measure GFRs.

According to the authors, this new formula could be a valuable tool for physicians who wish to monitor kidney function in young patients. "We are attempting to get clinical pathology laboratories to report an estimate of GFR as part of all basic chemistry panels obtained in children, so that clinicians can be aware if a child may have decreased kidney function prior to prescribing intravenous fluids, antibiotics, chemotherapy, and other agents potentially toxic to the kidneys," said Dr. Schwartz. "Especially for children with kidney problems or early kidney damage related to other medical issues, this approach should lead to fewer episodes of acute kidney injury in hospitals and treatment centers," he added.

"This new precise tool should help pediatricians accurately and easily gauge their patients' kidney function and predict a patient's ability to sustain any potentially dangerous treatments that could harm the kidneys," says Dr. Furth, a pediatric nephrologist and study co-author from Johns Hopkins Children's Center.

Source: American Society of Nephrology

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