Morning test helps doctors save kidneys

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A morning urine test is superior to all other tests for detecting declining kidney performance in patients with diabetic kidney disease, according to a study appearing in an upcoming issue of the *Journal of the American Society Nephrology* (*JASN*). The results suggest that clinicians should monitor kidney function by measuring the albumin:creatinine ratio from a first morning urine sample.

Individuals with kidney dysfunction often excrete excess protein in the urine, a condition called proteinuria. Screening for proteinuria may help identify people at risk for kidney disease progression, but uncertainties persist as to how urine should be collected and which specific urinary proteins should be measured. Because the different screening methods available may confuse clinicians, it may hamper the use of proteinuria to manage patients with kidney disease.

Hiddo Lambers Heerspink, PharmD, PhD (University Medical Center Groningen, in the Netherlands) and his colleagues assessed and compared the ability of various proteinuria measures, including proteinuria versus albuminuria and 24-hours versus early morning sampling, to predict worsening kidney problems. Albuminuria, a large component of proteinuria, is more specific than total proteinuria and is defined as an excess amount of albumin in the urine. Four measures were compared:

- urinary protein excretion from a 24-hour urine collection,

- urinary albumin excretion from a 24-hour urine collection,
- urinary albumin concentration from a first morning urine sample, and
- albumin:creatinine ratio from a first morning urine sample (the amount of albumin in the urine sample normalized by the amount of creatinine).

The investigators conducted their analysis in 701 patients with type 2 diabetes and kidney disease who were participating in the Reduction in Endpoints in Non Insulin Dependent Diabetes Mellitus with the Angiotensin-II Antagonist Losartan (RENAAL) trial. They defined worsening kidney function as the development of end-stage renal disease or a doubling of blood levels of creatinine (a breakdown product of muscle creatine). Kidney dysfunction diminishes the ability to filter creatinine, resulting in a rise in blood creatinine levels.

Dr. Lambers Heerspink and his team found that measuring the albumin:creatinine ratio in a first morning urine sample was the superior method to predict kidney problems in patients with type 2 diabetes and kidney disease. "From a clinical point of view, these results are very important, because they imply that collection of first morning voids, which is clearly more convenient than collecting a 24-hour urine, can be used for assessment of proteinuria," Dr. Lambers Heerspink said. The authors noted that standardizing proteinuria measures will improve methods for detecting and monitoring kidney disease.

The RENAAL study was sponsored by Merck & Co., Inc. Study co-authors include Ron Gansevoort, MD, PhD, Dick de Zeeuw, MD, PhD (University Medical Center Groningen); Barry Brenner, MD (Brigham and Women's Hospital and Harvard School of Medicine); Mark Cooper, MD PhD (Baker IDI Heart and Diabetes Research Institute, in

Melbourne, Australia); Hans Henrik Parving MD, PhD (University Hospital of Copenhagen, in Denmark); and Shahnaz Shahinfar, MD (Children's Hospital of Philadelphia).

In an accompanying editorial, Bryan Kestenbaum, MD and Ian de Boer, MD (University of Washington, Seattle) stated that "given data from this study and the considerable patient effort required for a 24-hour urine collection, we agree with the authors that the first morning albumin:creatinine ratio is in general the logical choice for quantifying proteinuria in clinical practice."

More information: The article, "Comparison of Different Measures of Urinary Protein Excretion for Prediction of Renal Events," (doi:10.1681/ASN.2010010063) and the accompanying editorial "Urine Albumin-to-Creatinine Ratio: What's in a Number?" (doi:10.1681/ASN.2010060614) will appear online on July 15, 2010.

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