Public release date: 21-Oct-2010

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American Society of Nephrology

Simple blood test helps predict chronic kidney disease

3 biomarkers provide clues about how kidney disease develops

Measuring three biomarkers in a single blood sample may improve physicians' ability to identify patients at high risk of developing chronic kidney disease (CKD), according to a study appearing in an upcoming issue of the *Journal of the American Society of Nephrology*.

IMAGE: Caroline S. Fox, MD, MPH is a part of the National Heart, Lung, and Blood Institute's Framingham Heart Study, Framingham, Mass.

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"Our results identify biomarkers that can improve CKD risk prediction," comments Caroline S. Fox, MD, MPH of the National Heart, Lung, and Blood Institute's Framingham Heart Study, Framingham, Mass.

The study included more than 2,300 participants in the Framingham Offspring Study, a long-term follow-up study of heart disease risk factors and outcomes. All participants had normal kidney function when they provided blood samples in 1995-98. An average of 9.5 years later, nine percent of patients had developed CKD. Another eight percent had high levels of protein in the urine (macroalbuminuria) at follow-up—a key sign of deteriorating kidney function

Stored blood samples from 1995-98 were tested to see if any of six different biomarkers could predict which patients were most likely to develop CKD. A combination of three biomarkers significantly improved the ability to identify patients at high risk of CKD, including homocysteine, a marker of atherosclerosis risk, and aldosterone, a hormone that affects salt handling by the kidneys. The same two biomarkers also predicted the risk of macroalbuminuria, as did B-type natriuretic peptide (BNP)—an indicator of heart damage in patients with heart failure.

Adding the biomarker results to standard risk factors like high blood pressure and diabetes would lead to an additional seven percent of patients being classified at high risk of CKD.

"Chronic kidney disease affects 13 percent of the adult population in the United States and is an important risk factor for cardiovascular disease," Fox explains. "It is difficult to identify early abnormalities using serum creatinine, the most commonly used measure to assess kidney function."

With further testing, these biomarkers identified could improve estimates of CKD risk. In addition, the nature of the three biomarkers may provide important clues into how CKD develops. Further studies are needed to see if treatments that reduce homocysteine levels or target the processes involving aldosterone and BNP can reduce the long-term risk of CKD.

The study was limited to participants of European ancestry; more research is needed to see if the results are generalizable to multiethnic populations.

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Disclosures: This study was supported by the National Heart, Lung, and Blood Institute's Framingham Heart Study (N01-HC-25195), 2-K24-HL04334, R01-HL-077477, R01-DK-080739, 1R01 AG028321. Study coauthors included Vasan Ramachandran, MD (also of the Framingham Study).

The article, "A Multi-Marker Approach to Predict Incident CKD and Microalbuminuria," will appear online at http://jasn.asnjournals.org/ on October 21, 2010, doi 10.1681/ASN.2010010085.

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