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KIDNEY FUNCTION DECLINE INCREASES RISK OF HEART FAILURE AND PREMATURE DEATH— EVEN IN PEOPLE WITHOUT KIDNEY DISEASE

Treatments to Keep Kidneys Functioning Normally May Safeguard Heart Health

Washington, DC (November 3, 2009) — Declining kidney function is linked to a higher risk of heart failure, heart attack, peripheral arterial disease, and early death in individuals with or without kidney disease, according to a pair of studies appearing in an upcoming issue of the *Journal of the American Society Nephrology* (JASN). The findings indicate that poor kidney function may raise an individual's risk for cardiovascular complications. To evaluate heart health, clinicians should factor in not only their patients' current level of kidney function, but also changes in kidney function over time.

Chronic kidney disease (CKD) patients have an increased risk of developing and dying from cardiovascular disease, but the links between kidney function and heart health are not well understood. Michael Shlipak, MD (San Francisco VA Medical Center and University of California, San Francisco), Mark Sarnak, MD (Tufts-New England Medical Center), and their colleagues studied clinical information from individuals who were enrolled in the Cardiovascular Health Study, a community-based study of elderly people. Using a new blood test of kidney function, called cystatin C, the researchers looked for links between changes in kidney function during a period of seven years with the incidence of heart failure, heart attack, stroke, and peripheral arterial disease (obstruction of large arteries in the arms and legs) during the subsequent eight years. Among 4,378 eligible participants in the study, those with rapid kidney decline (1,083 patients) demonstrated a 32% increased risk of experiencing heart failure, a 48% increased risk of having a heart attack, and a 67% increased risk of developing peripheral arterial disease. (They did not have an increased risk of suffering a stroke.)

Importantly, researchers identified an association between rapid kidney function decline and heart complications in patients with and without CKD. Treatments that slow the decline of kidney function and stabilize it in the normal range, before kidney disease develops, could have substantial health benefits.

In the second study, Kunihiro Matsushita, MD, PhD, Josef Coresh, MD, PhD (Johns Hopkins University), and their colleagues examined the effects of changes in kidney function in 13,029 participants of the Atherosclerosis Risk in Communities (ARIC) Study, a population-based sample of individuals aged 45 to 64 years. The researchers followed patients from 1987 to 2006, and monitored participants' kidney function at the start of the study, three years into the study, and nine years into the study. Investigators found that a large drop

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in kidney function over time—regardless of the initial level of function—increased one's risk of developing heart disease and of dying early. Patients whose kidney function dropped by more than 5.6% per year demonstrated a 30% increased risk of developing heart disease and a 22% increased risk of dying prematurely compared to patients with stable kidney function.

Physicians regularly monitor kidney function in elderly patients and patients with diabetes and hypertension to optimize the dose of prescription drugs excreted by the kidneys. This study indicates that physicians who detect a decline in patients' kidney function over time should view this as a sign of increased risk of heart disease and premature death.

"Our results suggest there may be clinical value in sequential kidney function data, often measured in routine care, even among individuals with mildly reduced kidney function," the authors wrote.

The authors in both studies report no financial disclosures. Dr. Shlipak's and Dr. Sarnak's co-authors include Ronit Katz, DPhil, Bryan Kestenbaum, MD, David Siscovick, MD (University of Washington); Linda Fried, MD (VA Pittsburgh Healthcare System); Anne Newman, MD (University of Pittsburgh); and Dena Rifkin, MD (Tufts-New England Medical Center). Dr. Matsushita's and Dr. Coresh's co-authors include Elizabeth Selvin, PhD, Lori Bash, PhD, Brad Astor, PhD (Johns Hopkins University), and Nora Franceschini, MD (University of North Carolina).

The articles, entitled "Rapid Decline of Kidney Function Increases Cardiovascular Risk in the Elderly" (doi 10.1681/ASN.2009050546) and "Change in Estimated GFR Associates with Coronary Heart Disease and Mortality" (doi 10.1681/ASN.2009010025) will appear online at http://jasn.asnjournals.org/ on November 5, 2009.

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