The approximately 3.5 million people who are homeless each year in the United States experience numerous barriers to obtaining appropriate and effective medical care, and they have high rates of physical illness, mental health disorders, and substance abuse.

"Prior studies suggested that risk factors for chronic kidney disease such as diabetes mellitus and hypertension might be elevated among homeless individuals, but the elusive nature of this population has limited our understanding of the long-term outcomes of chronic diseases in this population," said Yoshio Hall, MD, of the University of Washington, Seattle. "Our research attempts to address this knowledge gap and provides a rare glimpse into the characteristics and adverse health outcomes of this marginalized group."

Homelessness and health
To examine the associations between homelessness and the clinical outcomes of chronic kidney disease (CKD) among adults, Hall and his team analyzed the medical records of 15,343 adults with moderate to advanced CKD (stages 3–5) who received outpatient care from 1996 to 2005 from the Community Health Network, which along with a consortium of not-for-profit primary care clinics forms the backbone of San Francisco’s healthcare safety net system and offers an array of healthcare services including primary care, specialty care, and acute care. Their results were published recently in the Clinical Journal of the American Society of Nephrology.

A total of 858 (6 percent) of the adults in the study were homeless. The main outcome measures of this retrospective cohort study were emergency department visits, hospitalizations, and time to ESRD or death.

“We hypothesized that in this resource-poor setting, homeless adults would experience worse morbidity and mortality, and that they would use healthcare resources far less efficiently than indigent peers with stable housing,” said Hall. “We further hypothesized that the worse health outcomes among the homeless would be in part attributable to higher rates of substance use and other risk factors for death and disease progression.”

The researchers found that homeless adults were younger, were disproportionately represented among men, were more likely to have a history of incarceration, and had higher rates of substance abuse. They found that homeless adults were younger, were disproportionately represented among men, were more likely to have a history of incarceration, and had higher rates of substance abuse.

Renal Denervation Found Safe and Effective for Chronic Kidney Disease Patients
Benefits Include Increased Hemoglobin

Renal denervation—a technique that uses radiofrequency waves to disrupt the overactive sympathetic nerves running along the arteries in the kidneys—can lower blood pressure in individuals with resistant hypertension and normal kidney function, but clinicians have worried that the procedure might not be safe for patients with compromised kidney function.

Homeless CKD patients experience increased kidney failure and premature death
By Tracy Hampton
Renal Denervation

Continued from page 1

New research largely puts these concerns to rest. A study recently published in the Journal of the American Society of Nephrology found that renal denervation not only can safely and effectively lower blood pressure in patients with chronic kidney disease (CKD) and hypertension but also may provide additional benefits, including a potential increase in hemoglobin concentration and reductions in proteinuria, brain natriuretic peptide levels, and peripheral arterial stiffness index.

Although the study’s clinical trial enrolled only a small number of patients, it provides guidance for further studies and clinical trials to properly assess the short- and long-term safety and efficacy of renal nerve ablation in CKD. “It also emphasizes the concept that renal denervation may address crucial pathophysiologic mechanisms underlying the high cardiovascular morbidity and mortality rates in patients with chronic kidney disease and may provide a valuable tool in slowing the rate of progression of chronic kidney disease and its complications,” the authors wrote.

Targeting the fight-or-flight response

Overactivity of neurons in the sympathetic nervous system, which controls the body’s fight-or-flight response, is very common in patients with CKD. In addition to contributing to high blood pressure and heart problems in these patients, it can also worsen their kidney disease. Because targeting this system might provide significant benefits to individuals with kidney dysfunction, principal investigator Markus Schlaich, MD, of the Baker IDI Heart and Diabetes Institute in Melbourne, Australia, and his team designed a catheter-based renal nerve ablation trial in 15 patients with resistant hypertension and stage 3–4 CKD (mean estimated GFR 31 mL/min per 1.73 m²).

“The main aim of this study was to prove the safety and efficacy of the procedure in the setting of chronic kidney disease, which has not been tested before,” said Schlaich. Patients underwent an average of 9.9 ablation treatments, with no perioperative or postprocedural complications noticed a tendency toward gradually increased serum hemoglobin levels in all treated patients. This could be important for patients with comorbid conditions, including resistant hypertension, diabetes, obesity, and obstructive sleep apnea.

Several interesting observations may deserve further investigation in future clinical trials. For example, the investigators noticed a tendency toward gradually increased serum hemoglobin levels in all treated patients. This could be important for patients with comorbid conditions, including resistant hypertension, diabetes, obesity, and obstructive sleep apnea.

Future studies

This first clinical experience with catheter-based renal nerve ablation in high-risk patients with moderate to severe kidney impairment indicates that the procedure may provide beneficial health effects beyond improved blood pressure control in patients with comorbid conditions, including resistant hypertension, diabetes, obesity, and obstructive sleep apnea.

“Several interesting observations may deserve further investigation in future clinical trials. For example, the investigators noticed a tendency toward gradually increased serum hemoglobin levels in all treated patients. This could be important for patients with comorbid conditions, including resistant hypertension, diabetes, obesity, and obstructive sleep apnea.”
Renal Denervation

Continued from page 3

because the prevalence of anemia increases with deteriorating renal function and is related to heart complications and cerebrovascular events. Interestingly, the results of both experimental and human studies have suggested a role of renal sympathetic nerves in the regulation of erythropoiesis. The investigators also observed a trend toward reduced urinary albumin excretion after patients underwent renal denervation, as well as a trend toward reduced plasma concentrations of circulating brain natriuretic peptide. Brain natriuretic peptide is considered an independent predictor of cardiovascular death not only in cardiovascular syndrome but also in early-stage kidney disease in the absence of heart failure.

Finally, patients in the study experienced an improvement in augmentation index. Higher augmentation index is associated with target-organ damage in patients receiving hemodialysis and with microalbuminuria in those with essential hypertension. Renal denervation may rapidly affect the peripheral vasculature through a significant reduction in arterial stiffness. “These initial findings now open up an entirely new approach to better control blood pressure in chronic kidney disease and potentially slow down progression of the disease and reduce cardiovascular risk in these patients,” Schlaich said. “Studies are now warranted to look into this in detail.”

Disclosures: This study was funded in part by grants from the National Health and Research Council of Australia (NHMRC) and the Victorian Government’s Operational Infrastructure Support Program, Professor Schlaich, Professor Edel, Dr. E. Lambert, and Dr. G. Lambert are supported by career fellowships from the NHMRC. Dr. Dagmara Hering is currently supported by a Research Fellowship from the Foundation for Polish Science KOLUMB/2010-1. Dr. Felix Mahfoud is supported by the Deutsche Hochschul-liga, Drs. Schlaich, Mahfoud, Walton, Krum, Boehm, and Epler are principal investigators in studies sponsored by Medtronic, the company that manufactures the renal denervation device, and have received travel/lodging/lecture fees from Medtronic.

The article, entitled “Renal Denervation in Moderate to Severe CKD,” is available at http://jasn.asnjournals.org/.

ASN Glomerular Disease Advisory Group Meets with FDA

By Daniel C. Cattran

Dialogue between members of the U.S. Food and Drug Administration and ASN’s Glomerular Disease Advisory Group continued at the recent National Institute of Diabetes and Kidney Diseases-sponsored symposium Glomerular Disease: Pathophysiology, Biomarkers, and Registries for Facilitating Translation Research. The discussion focused on possible end points to support the approval of new treatments for glomerular disease. Challenges associated with establishing proteinuria as a surrogate end point (a biomarker intended to substitute for a clinical efficacy end point) in drug trials for glomerular diseases were identified. Both groups agreed that future discussions should focus on the data supporting proteinuria as a surrogate within the context of a specific glomerular disease.

Patient-reported outcome measures were recognized as another important approach for establishing a drug’s efficacy and an area that required further exploration and discussion. It was also agreed that a number of disease-specific and thematically-focused “white papers” should be published as a joint venture. These papers will address the next steps in defining optimal end points for the approval of drugs to treat glomerular diseases.

Daniel C. Cattran, MD, is senior scientist, division of clinical investigation and human physiology, Toronto General Research Institute, and member of the ASN Glomerular Disease Advisory Group.