A dipstick that uses the saliva of an individual with suspected acute kidney injury (AKI) can quickly and accurately detect and diagnose AKI, without the need for laboratory facilities. The novel test strip, described in research presented at ASN Kidney Week (1), could help preserve the kidney health of millions of individuals in developing countries and help first responders in natural disaster zones make a fast diagnosis to help save kidney function and lives.

The test uses a pH marker to indicate the amount of urea in the saliva. To verify the dipstick’s accuracy, Vivian Calice da Silva, MD, of Brazil’s Pró-Rim Foundation and her colleagues conducted a study in 44 patients with suspected AKI. They first had to demonstrate the test could discriminate low levels from high levels of saliva urea nitrogen and that these levels correlated closely with the blood urea nitrogen normally used to diagnose AKI. They used saliva and blood urea nitrogen levels to classify AKI stages utilizing the Acute Kidney Injury Network (AKIN) criteria.

“We found a good correlation between blood and saliva urea nitrogen,” said Calice da Silva. The laboratory analysis of the blood samples and the results from saliva samples were positively correlated at all AKIN stages and for all causes of AKI. Importantly, the test significantly discriminated the more severe AKIN Stage 3 from earlier stages of renal injury.

The impact of this new diagnostic method to quickly assess kidney health could be felt greatest in the developing world, said Jorge Cerda, MD, FASN, of the Albany Medical College in Albany, NY. “This study shows how a simple test can have enormous projections,” he said. “In many places in the developing world people do not have access to lab facilities, and those health professionals that are available may not be able to diagnose the problem. But if this test could quickly identify the presence of renal dysfunction without complicated tests, this could be a valuable component of an initial screening model.”

In developing countries AKI is thought to be less of a problem than in developed countries, but that’s not true, said Cerda (2). “Probably the incidence is the same, only it’s profoundly underrecognized,” he said. “From a population standpoint, what is unknown doesn’t get treated and doesn’t become a policy priority. If you can determine the true incidence of AKI, you can appropriately allocate the limited public health funds available.”

Many developing nations cannot afford an end stage renal disease (ESRD) program, but small interventions—like this test or offering clean water—offer a large bang for the buck and can help avoid the AKD complications, Cerda said. “We can make a tremendous difference.”

“The saliva urea nitrogen dipstick could help in primary care in areas with limited medical infrastructure, or in emergent settings where quick decisions are crucial for the patient’s benefit,” said Calice da Silva, “particularly since the incidence of volume-responsive AKI caused by diarrheal diseases, malaria, or gynecologic/obstetric complications is substantially higher than in developed countries. It could be a useful tool to diagnose AKI early, allow immediate therapeutic approaches such as fluid resuscitation and/or hemodialysis, resulting in improved outcomes.”

The test could also be used in natural disaster zones when a quick diagnosis and urgent treatment are necessary to protect kidney health. “It could be specifically useful for triage of patients in large-scale disaster emergency settings, but also for primary caregivers first-responding to acute morbidity events, Calice da Silva said. “In such settings it could make a difference resulting in improved outcomes and facilitate decisions such as dialysis initiation or transportation to (often far distant) medical facilities.”

The strip has yet to be approved by the FDA; its manufacturer (IBT Biomed) anticipates the cost per strip when available to be approximately $1.

References

Mediterranean Diet May Help Preserve Kidney Function

By Kurtis Pivert

A Mediterranean diet may be beneficial for not only heart health, but kidney health as well. This is the conclusion of a new long-term study presented at Kidney Week 2013 that found individuals following a regimen similar to a Mediterranean diet reduced their risk for developing chronic kidney disease (CKD) and for rapid decline in kidney function. Although the diet’s heart health benefits have received public attention, it has been unknown if this diet confers any nephroprotective effects. Because of the close connection between cardiovascular and kidney disease, Minesh Khatri, MD, and his coworkers from Columbia University theorized a Mediterranean diet may have a positive effect on preserving renal function.

They examined the multiethnic Northern Manhattan Study cohort, a prospective, long-term, multiethnic cohort of 3298 residents of Upper Manhattan. Each participant underwent a baseline screening and was followed up annually by phone. Khatri isolated a subset of 900 individuals who underwent subsequent laboratory testing approximately 7 years later. Adherence to a diet similar to a Mediterranean diet (higher in vegetables, fruit, unrefined whole grains, and lower in meat and dairy products than a traditional Western diet) was scored using the 9-point MedDi system.

In contrast to the DASH (Dietary Approaches to Stop Hypertension) diet—which limits sodium intake to less than 2300 mg (or in some case 1500 mg) per day—the Mediterranean diet has more of an emphasis on the so-called “heart-healthy” monounsaturated fats (such as those found in olive oil and nuts) as well as a moderate intake of wine, said Khatri.

Their analysis looked at two outcomes: a primary outcome of incident stage III CKD, and a secondary outcome of rapid kidney function decline. The