Spotting the Earliest Signs of Type 1 Diabetic Kidney Disease

JDRF network grant to fund study to find new types of diagnostic markers

October 22, 2015 |

I n an effort to pinpoint the earliest signs of diabetic kidney disease, researchers at University of California, San Diego School of Medicine are leading a multi-institutional international effort dedicated to finding a new breed of disease indicators.

The study, funded by a $2.5 million JDRF (formerly known as the Juvenile Diabetes Research Foundation) grant, will tap the potential of three emerging "omics" sciences to discover new ways to determine which patients are most likely to develop diabetic kidney disease. Samples from more than 2,000 type 1 diabetes patients, collected over a period of years by several medical centers around the world, will be used in the analyses.

"We want to identify the best markers of kidney disease progression and validate them across different patient cohorts," said principal investigator Kumar Sharma, MD, professor of medicine and director of the Center for Renal Translational Medicine and the Institute of Metabolomic Medicine at UC San Diego School of Medicine.

Diabetic kidney disease is the leading cause of end-stage kidney disease, the eighth leading cause of death in the United States and a major risk factor for cardiovascular disease. An estimated 26 million American adults have chronic kidney disease, often requiring dialysis or a kidney transplant.

Sharma, who said the study is one of the largest of its kind, noted that new biomarkers could enable earlier and more accurate identification of patients at risk for diabetic kidney disease. "The current test, measuring albumin protein levels, is not an ideal biomarker in that some patients may still have progressive kidney disease with low levels of albumin in their urine," he said.

Researchers from three universities will participate in the study – each analyzing type 1 diabetes patient samples of blood and urine – in hopes of finding new "omics" biomarkers for kidney disease.

At UC San Diego School of Medicine, researchers will conduct metabolomics analysis to look for metabolites that may serve as chemical signatures of kidney disease. Metabolites are small

molecules involved in or produced through metabolic processes in cells. More than 10,000 distinct metabolites are estimated to reside in the human body. In addition to researchers from Sharma's group, Loki Natarajan, PhD, a professor in the Division of Biostatistics & Bioinformatics, Moores Cancer Center and the Institute of Metabolomic Medicine, will coordinate the biostatistical efforts for the network.

At University of Washington at Seattle, which has special expertise in proteomics – the large-scale study of proteins – researchers will look for proteins that may be predictive of diabetic kidney disease, while at University of Michigan, scientists will analyze lipids (fats) in the patient samples, a field known as lipidomics.

Sharma said the patient samples, in which patients with type 1 diabetes were followed for five, 10 and even up to 20 years at Helsinki University (Finland), Steno Institute (Denmark), University of Pittsburgh and University of Colorado, will allow the research groups to identify and validate biomarkers at different diabetes stages, thereby enabling them to track the presence of biomarkers with disease progression. The project will also coordinate data with the Joslin Medical Center in Boston and the University of Dundee in Scotland.

Care at UC San Diego Health

Diabetes Care

Share This Article

Related News

UC San Diego Partners with Janssen to Research New Approaches to Treat Metabolic Diseases
6/15/2017

New Bioinformatic Analysis Reveals Role of Proteins in Diabetic Kidney Disease
11/15/2016

Pivotal Inflammatory Players Revealed in Diabetic Kidney Disease
4/8/2016

Researchers Find Key Player in
Diabetic Kidney Disease Through
Power of Metabolomics
7/22/2015

View All News >

Follow Us

Follow @ucsdhealth