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ASN KIDNEY WEEK 2015 • NOVEMBER 3–8 • SAN DIEGO, CA

GUT MICROBIOTA CHANGES IN DIABETIC KIDNEY DISEASE CONTRIBUTE TO CHRONIC INFLAMMATION AND VASCULAR COMPLICATIONS

Study advances current understanding of the intimate mechanisms of interactions between the gut-renal axis

Highlights

- Among patients with type 2 diabetes and advanced chronic kidney disease (CKD), a shift in gut microbiota diversity in combination with elevated plasma zonulin levels substantially impacts the degree of chronic inflammation and endothelial dysfunction.
- Zonulin could be a potential future target to control inflammatory immune responses, according to a study that will be presented at ASN Kidney Week 2015 November 3–8 at the San Diego Convention Center in San Diego, CA.

San Diego, CA (November 6, 2015) — Diabetes is a leading cause of chronic kidney disease (CKD), and patients with type 2 diabetes often experience persistent low-grade inflammation, decreased gastrointestinal tract motility and vascular deterioration. New research to be presented at ASN Kidney Week 2015 finds that a shift in the gut's microbial fauna in combination with higher levels of plasma zonulin (a protein that assists in opening tight junctions within the small intestine that can be indicative of leaky gut syndrome) may be linked with chronic inflammation and endothelial dysfunction.

The study, led by Ruchi Singh, PhD, sought to assess how gut microbiota—measured by biomarkers for compromised metabolism, leaky gut syndrome, and diminished clearance—affected the vascular health of CKD patients (stage 4 and 5) with diabetic nephropathy. These included plasma zonulin, inflammatory cytokines (transcription necrosis factor α [TNF- α], interleukin-6 [IL-6]) in conjunction with fibroblast growth factor 23 (FGF-23), the vasoconstrictor endothelin 1 (ET-1), and levels of lipopolysaccharide (LPS).

Researchers evaluated the diets in 40 participants, including age- and gender-matched healthy controls. Their TNF- α , IL-6, FGF-23, ET-1, and LPS levels were measured, and gut microbiota analyzed.

“We observed significant gut microbiome shifts in CKD patients with diabetes compared with age, gender, and diet match control subjects,” Dr. Singh said. Patients with type 2 diabetes and advanced CKD exhibited a greater proportion of LPS-producing bacteria. Furthermore, significantly elevated circulating serum zonulin pointed to a prominent increase in gut permeability.

“This study is one of the first steps to better understand how patients with advanced CKD and type 2 diabetes mellitus might be impacted by gut microbiome diversity shifts,” Dr. Singh said, “and how the manipulation of the structure and functions of human microbiota will allow effective prevention and treatment of these conditions.”

Study: “Association between Gut Microbiome and Cardiovascular Risk in Chronic Kidney Disease Patients with Type 2 Diabetes Mellitus” (Abstract FR-PO530)

Disclosures: Tetyana L. Vasylyeva is a scientific advisor for Alexion.

ASN Kidney Week 2015, the largest nephrology meeting of its kind, will provide a forum for more than 13,000 professionals to discuss the latest findings in kidney health research and engage in educational sessions related to advances in the care of patients with kidney and related disorders. Kidney Week 2015 will take place November 3–8, 2015, in San Diego, CA.

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