TACSM Abstract

Relationship Between Intestinal Permeability and Microvascular Responses in a High-risk Hispanic Population of the Rio Grande Valley.

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ABSTRACT

The Rio Grande Valley (RGV) has ~3x higher rates of diagnosed cardiovascular disease (CVD) and type 2 diabetes (T2D) than the US, which combine to be the leading cause of preventable death in the developed world. Microvascular blood flow (MBF) responses are an early indicator of vascular insulin resistance, and is blunted with obesity, T2D, and those at high risk for T2D. We have previously shown that apparently healthy people in the RGV display impaired MBF responses, helping explain the disparities noted with chronic disease. However mechanisms explaining this early vascular insulin resistance remain unexplored. Recent studies indicate that increased intestinal permeability promotes mechanisms for both CVD and T2D and may play a role in microvascular insulin resistance. **PURPOSE:** Identify relationships between markers of intestinal permeability (TMAO) and MBF responses in healthy people in the RGV. **METHODS**: Anthropomentrics were measured in17 healthy participants from the RGV (age: 25±6 yrs, BMI: 25±3 kg/m2, fat mass %: 29±9%, and android fat %: 31±10.4%) without hypertension, T2D, or dyslipidemia and were administered a mixed meal and oral glucose challenge (MMC and OGC) on two separate occasions, and asked to provide a 3-day food record to calculate macro and micronutrient intake. Blood samples and forearm skeletal muscle MBF (measured as acoustic intensity/second (AI/s)) were taken pre- and 1-hour postprandial via contrast-enhanced ultrasound (CEU). **RESULTS**: MBF responses did not differ between meal tests. ΔTMAO was associated with triglyceride ($r=0.45$, $p<0.05$) and inversely correlated with ΔMBF in both skeletal muscle and adipose ($r = -0.39$ and -0.485 respectively; $p<0.05$), while vitamin D intake, which promotes intestinal health, was inversely related to BMI, waist circumference, %fat, and %android fat ($r= -0.385$-0.474, -0.41, -0.45 respectively, $p <0.05$). **CONCLUSIONS:** Residents of the RGV display microvascular insulin resistance as per a MMC. The inverse relationships between TMAO and MBF suggest increased intestinal permeability may mediate these vascular defects. Conversely, vitamin D intake may protect microvascular health via promotion of intestinal health. This is evidenced in part by the inverse relationships between vitamin D intake and body composition, most notably android fat which is exacerbated with increased intestinal permeability.