

Effect of Dietary Potassium on High Sodium Diets in Salt-Resistant Adults

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Endothelial dysfunction, characterized by impaired dilation is an important non-traditional risk factor for atherosclerosis. We have shown that high sodium diets, independent of blood pressure (BP), result in endothelial dysfunction in salt-resistant (SR) adults. Potassium is known for its BP lowering properties but its beneficial role on the vasculature alone remains unclear. The purpose of this study was to determine if dietary potassium can offset the deleterious effect of high sodium on vascular function.

Methods: Twenty-two normotensive adults with salt-resistant BP (10M, 12F; 27±1yr) completed 7 days each of the 3 following diets: 120mmol potassium/300mmol sodium (HK/HS); 65mmol potassium/300mmol sodium (MK/HS); and 65mmol potassium/50mmol sodium (MK/LS) in random order (controlled feeding study). SR, defined as ≤5 mmHg change in 24-h mean arterial pressure (MAP) was assessed on the MK/HS and MK/LS diets. On the last day of each diet, brachial artery flow-mediated dilation (FMD) was measured in response to reactive hyperemia and venous endothelial cells (EC) were assessed for endothelial sodium channel (EnNaC) abundance, a marker of cell stiffness.

Results: 24-hMAP was unchanged between the 3 diets ($p>0.05$) confirming SR. Sodium excretion was increased on the HS diets compared to LS/MK ($p<0.05$). FMD was lower on MK/HS ($5.1\pm 0.6\%$) compared to MK/LS ($7.6\pm 0.6\%$; $p<0.05$) while HK/HS ($6.8\pm 0.7\%$) trended towards improvement compared to MK/HS but was not different from LS/MK ($p=.16$). Venous ECs showed a 38% decrease in abundance of EnNaC on the HK/HS compared to MK/HS diet.

Conclusions: These preliminary data suggest that potassium may provide vascular protection against the deleterious effects of high sodium by improving FMD potentially by reducing endothelial cell stiffness.

Biography:

Dr. Shannon L Lennon is an Associate Professor at the University of Delaware (USA) in the Department of Kinesiology and Applied Physiology. Dr. Lennon has a background in nutrition and exercise physiology. Her laboratory, the Cardiovascular and Nutrition Research Lab focuses on the role of dietary nutrients on the cardiovascular system in healthy and diseased states. Her lab group uses a variety of techniques to study heart and blood vessel function in humans.