

Obesity-Induced Diabetes and Lower Urinary Tract Fibrosis Promote Urinary Voiding Dysfunction in a Mouse Model

Mehrnaz Gharaee-Kermani, Jose A. Rodriguez-Nieves and Jill A. Macoska

Center for Personalized Cancer Therapy and Department of Biology, The University of Massachusetts, Boston,

Background: Progressive aging- and inflammation-associated fibrosis effectively remodels the extracellular matrix to increase prostate tissue stiffness and reduce urethral flexibility, resulting in urinary flow obstruction and Lower Urinary Tract Symptoms (LUTS). In the current study we sought to test whether senescence-accelerated mouse prone (SAMP)6 mice, which were reported to develop prostatic fibrosis, would also develop LUTS, and whether these symptoms would be exacerbated by diet-induced obesity and concurrent Type 2 Diabetes Mellitus (T2DM).

Methods: To accomplish this, SAMP6 and AKR/J background strain mice were fed regular mouse chow, low fat diet chow, or high fat diet chow for 8 months, then subjected to glucose tolerance tests, assessed for plasma insulin levels, evaluated for urinary voiding function, and assessed for lower urinary tract fibrosis.

Results: The results of these studies show that SAMP6 mice and AKR/J background strain mice develop diet-induced obesity and T2DM concurrent with urinary voiding dysfunction. Moreover, urinary voiding dysfunction was more severe in SAMP6 than AKR/J mice and was associated with pronounced prostatic and urethral tissue fibrosis.

Conclusions: Taken together, these studies suggest that obesity, T2DM, lower urinary tract fibrosis, and urinary voiding dysfunction are inextricably and biologically linked.

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