Bladder and erectile dysfunctions in the type 2 Diabetic Goto-Kakizaki rat

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OBJECTIVES

- Urological functional complications such as bladder and erectile dysfunctions (ED) significantly impact the quality of life of diabetic patients.
- Most of experimental in vivo studies of ED/bladder dysfunction caused by diabetes have used type 1 diabetes models.
- A robust model for type 2 diabetes urological complications is lacking.

Aim of the study:

- Evaluate bladder and erectile function in the Goto-Kakizaki (GK) rat model for type 2 diabetes.
- Evaluate the responses to standard-of-care treatments for overactive bladder and erectile dysfunction in GK rats.

RESULTS

Erectile function evaluation: electrical stimulation of the cavernous nerve

Erectile responses elicited by cavernous nerve stimulation at increasing stimulation frequencies in anaesthetized Wistar and GK rats. Sildenafil (0.3 mg/kg) significantly increased the erectile response to ES CN in both Wistar or GK rats. The magnitude of this improvement was similar in both rats: at 15 Hz, AUC/MAP was increased by approximately 30% in both strains.

CONCLUSIONS

- The present study demonstrates that GK rats have many pathophysiological features in term of urological complications which are common to diabetic patients. They display diabetic bladder dysfunction characterized by detrusor overactivity, an increase in bladder capacity and micturition pressures. These rats also have erectile dysfunction associated.
- Furthermore, standard of care treatments for both disorders are effective in GK rats.
- Thus, GK rats represent a suitable and validated research model to better understand the pathophysiology of type 2 diabetes-associated bladder and erectile complications and to assess efficacy of new therapeutic agents targeting diabetic bladder and/or erectile dysfunctions.