

# Clinical and Urodynamic Evaluation of Women Referred with Diabetes Mellitus

YUAN Zhengyong<sup>1</sup>, LEI Jing<sup>1</sup>, HE Changxiao<sup>1</sup>, YAN Shibing<sup>1</sup>, SHEN Hong<sup>2</sup>  
 1. Dujiangyan Medical Center, 2. West China Medical Center

## Introduction

Diabetes mellitus is a systemic, metabolic condition characterized by hyperglycemia. It affects an estimated 8.3 % of the US population and in China, its estimated prevalence is ~11.6 %. Diabetes mellitus imposes a substantial economic burden on healthcare systems, with a total cost of CNY 806 billion in China in 2013 and USD 245 billion in the US in 2014. Diabetic cystopathy, a most common urological complication, is traditionally described as a triad of decreased bladder sensation, increased bladder capacity, and poor bladder emptying, which was first described by Frimodt Moller in 1976. However, it has become increasingly evident that diabetic patients have significant bother from overactive bladder, and it has its modern definition and causes a broad spectrum of lower urinary tract symptoms, including overactive bladder, voiding dysfunction, and urinary retention. Lee in 2004 estimated the prevalence rate of urodynamically diagnosed diabetic cystopathy ranged from 25 % to 90 %. The various prevalence rates of LUTS were estimated due to lack of a validated and standardized measure used to diagnose diabetic cystopathy and the patients' selected referral. In China, few basic researches or clinical trials have evaluated the impact of diabetic mellitus on lower urinary tract symptoms, and clinicians usually ignore voiding complaints in patients with diabetic mellitus. In this study, we investigated the impact of diabetes mellitus (DM) on female lower urinary tract dysfunction.

## Methods

We prospectively collected data of 1,640 consecutive diabetic women from the inpatient departments and outpatient clinics of urology, endocrinology, geriatrics, and nephrology in primary, secondary, and tertiary referral hospitals, rural healthcare stations, and nursing homes in Dujiangyan, China. Clinical histories were taken on an individualized basis depending on patient presentation. Urodynamics were performed in the enrolled female diabetic patients after excluding other causes of lower urinary tract dysfunction. Data on lower urinary tract symptoms and urodynamic parameters were analyzed.

## Results

Ninety-three percent of diabetic women complained of lower urinary tract symptoms, and 88 % had positive urodynamic findings. Sixty-three percent presented with storage symptoms, 918 cases of which had detrusor overactivity, 787 impaired detrusor contractility, and 131 detrusor areflexia. Among the 918 patients with impaired detrusor contractility or detrusor areflexia, the mean first sensation of filling was 238.1 ml, with a mean maximum cystometric capacity of 624 ml, mean maximum flow rate of 9.6 ml/s, mean detrusor pressure at maximum flow rate of 32.4 cmH<sub>2</sub>O, and mean postvoid residual of 323 ml. Thirty-eight of 131 patients with detrusor areflexia had impaired renal function on blood chemistry test, and massive bilateral ureterohydronephrosis and "Christmas-tree-shaped" bladder in videourodynamic studies. On the whole, 95 % diabetic women had diabetic cystopathy.

Table 1. Prevalence of LUTS and Urodynamic Findings in Diabetic Women

Number of subjects(n)	Storage symptoms		Voiding symptoms		Storage symptoms	LUTS negative	
	Involuntary detrusor contraction with normal contractility	Involuntary detrusor contraction with impaired contractility	impaired detrusor contractility	Detrusor areflexia	Normal urodynamics	Abnormal urodynamics	Normal Urodynamics
1640	492	426	361	131	115	33	82

## Conclusions

DM alters voiding patterns significantly, causing various lower urinary tract symptoms in a significant proportion of diabetic women. Diabetic cystopathy is a progressive condition with a spectrum of clinical symptoms and urodynamic findings. The prevalence of diabetic cystopathy is very high in Dujiangyan, China.

## Acknowledgements

Grateful acknowledgement is made to ICS for the conference travel award which gives me considerable help.