

CLINICAL SIGNIFICANCE OF DIABETES MELLITUS ON DETRUSOR FUNCTIONALITY ON STRESS URINARY INCONTINENT WOMEN WITHOUT BLADDER OUTLET OBSTRUCTION

Hypothesis / aims of study

To evaluate the effect of diabetes mellitus (DM) on detrusor contractility (DC) in women without bladder outlet obstruction (BOO) by urodynamic study (UDS).

Study design, materials and methods

We reviewed the clinical records of 863 consecutive women without BOO, each of whom was diagnosed with stress urinary incontinence by UDS. Uroflowmetry measurements included maximal flow rate (Qmax), time to Qmax, voided volume, and post-void residual urine volume (PVR). The data offrom the filling cystometry included the first strong desire to void and the Valsalva leak point pressure (VLPP). For voiding cystometry data, the detrusor pressure at Qmax (Pdet@Qmax) and bladder contractility index (BCI) were analyzed. In the DM group, the level of glycosylated hemoglobin (HbA1c) was measured as well as the duration of DM.

Results

After the application of exclusion criteria, complete UDS data of 708 of these patients were available. The cohort was divided into two groups according to DM status. The DM group contained 92 (12.9%) patients, whereas the non-DM group contained 616 (87.0%) patients. The mean maximal flow rate was lower in the DM group. The mean Pdet@Qmax and bladder contractility index were also lower in the DM group. In the DM group, the mean duration of DM was 9.24 ± 7.63 years and the mean HbA1c level was $7.27 \pm 1.43\%$. The duration of DM was significantly correlated with Qmax (-0.309 , $p=0.003$), Pdet@Qmax (-0.369 , $p<0.001$), and BCI (-0.409 , $p<0.001$). Moreover, the HbA1c level was significantly correlated with Qmax (-0.256 , $p=0.016$), Pdet@Qmax (-0.231 , $p=0.026$), and BCI (-0.308 , $p=0.002$).

Interpretation of results

DM has caused worsening of the detrusor contractility in women without BOO, in addition the longer duration of DM as well as the poor glycemic control were also associated with the worsening of detrusor contractility.

Concluding message

Our UDS data revealed that DM is associated with impaired DC in women without BOO. Moreover, longer duration of DM and poor glycemic control were both associated with impaired DC.

Table 1 Comparison of characteristics and urodynamic parameters between DM vs non DM groups.

	DM group (n=92)	Non-DM group (n=616)	P value
Age (yr)	58.34 ± 8.25	59.27 ± 7.57	0.832
Hypertension (%)	48.9 (n=45)	22.2 (n=137)	$<0.001^{\dagger}$
Parity (n)	2.72 ± 1.22	2.84 ± 1.43	0.853
Uroflowmetry			
Qmax (mean \pm SD, mL/sec)	23.55 ± 10.26	25.96 ± 10.64	0.043*
Voided Volume (mean \pm SD, mL)	274.73 ± 131.92	286.33 ± 129.01	
Voiding time (mean \pm SD, sec)	26.71 ± 16.78	25.43 ± 15.13	0.459
PVR (mean \pm SD, mL)	33.24 ± 55.63	29.28 ± 41.94	0.434
Filling cystometry			
First desire to void (mean \pm SD, mL)	173.40 ± 75.84	162.00 ± 77.14	0.199
Strong desire to void (mean \pm SD, mL)	362.98 ± 86.64	345.14 ± 87.34	0.082
VLPP (mean \pm SD, cmH ₂ O)	72.62 ± 19.07	75.20 ± 19.93	0.254
Voiding cystometry			
Pdet@Qmax (mean \pm SD, cmH ₂ O)	26.78 ± 15.40	32.99 ± 23.86	0.016*
BCI (mean \pm SD)	144.53 ± 85.62	162.79 ± 92.35	$<0.001^{\dagger}$

DM diabetes mellitus, *Qmax* maximal flow rate, *PVR* post-void residual urine volume, *MCC* maximal cystometric capacity, *SD* standard deviation, *VLPP* valsalva leak point pressure, *Pdet@Qmax* detrusor pressure at *Qmax*, *BCI* bladder contractility index
†Fisher's exact test, P<0.05, *Student's t test, P<0.05

Table 2 Spearman correlation coefficient of duration of DM, HbA1c and urodynamic parameters in DM groups.

	Duration of DM (years)	P value	HbA1c	P value
Uroflowmetry				
<i>Qmax</i> (mean±SD, mL/sec)	-0.309	0.003*	-0.256	0.016*
Voided Volume (mean±SD, mL)	-0.173	0.101	0.560	0.672
Voiding time (mean±SD, sec)	0.144	0.173	-0.076	0.561
<i>PVR</i> (mean±SD, mL)	0.107	0.322	0.434	0.830
Filling cystometry				
First desire to void (mean±SD, mL)	-0.083	0.449	-0.156	0.251
Strong desire to void (mean±SD, mL)	-0.189	0.087	-0.112	0.416
<i>VLPP</i> (mean±SD, cmH ₂ O)	-0.180	0.098	-0.161	0.225
Voiding cystometry				
<i>Pdet@Qmax</i> (mean±SD, cmH ₂ O)	-0.369	<0.001*	-0.231	0.026*
<i>BCI</i> (mean±SD)	-0.409	<0.001*	-0.308	0.002*

DM diabetes mellitus, *HbA1c* glycosylated hemoglobin, *Qmax* maximal flow rate, *PVR* post-void residual urine volume, *MCC* maximal cystometric capacity, *SD* standard deviation, *VLPP* valsalva leak point pressure, *Pdet@Qmax* detrusor pressure at *Qmax*, *BCI* bladder contractility index

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Disclosures

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