

IMPACT OF TOLTERODINE TREATMENT ON DETRUSOR WALL THICKNESS, BLADDER BLOOD FLOW PERFUSION AND SEXUAL FUNCTION OF WOMEN WITH OVERACTIVE BLADDER SYNDROME

Hypothesis / aims of study

Tolterodine may improve arterial stiffness [1] and detrusor wall thickness seems to be associated with detrusor overactivity. Thus, this study was aimed to elucidate whether detrusor wall thickness, bladder blood flow perfusion and female sexual function would be changed after 3 months' tolterodine treatment for female overactive bladder syndrome (OAB).

Study design, materials and methods

Between September 2010 and March 2016, all women with OAB were requested to participate in this prospective study. Only data in women with complete 3 months' tolterodine treatment were reviewed. All women underwent three-dimensional power Doppler ultrasound, Patient Perception of Bladder Condition (PPBC), Urgency Severity Scale (USS), Overactive Bladder Symptoms Scores (OABSS), Urogenital Distress Inventory-6 (UDI-6) and Incontinence Impact Questionnaire-7 (IIQ-7) and Female Sexual Function Index Questionnaire (FSFI) before and after 3-months' treatment. Three sites (anterior wall, trigone and dome) of the bladder wall thickness, bladder wall volume, vascularization index (VI), flow index (FI) and vascularization-flow index (VFI) were measured after bladder emptying. Wilcoxon sign-rank test was performed for statistical analysis.

Results

A total of 41 women with OAB underwent complete 3-months' tolterodine treatment (Table 1). There was a trend to be significant in correction between bladder wall volume and OABSS scores ($\rho=0.32$, $P=0.06$, Table 2). After 3-months' treatment, scores of PPBC, OABSS, UDI-6 and IIQ-7 were improved; However, FSFI, all sites of detrusor wall thickness, bladder wall volume, VI, FI, VFI did not differ between before and after treatment (Table 3).

Interpretation of results

Despite of improvement of OAB symptoms, detrusor wall thickness did not change after treatment. Detrusor wall thickness is not a good tool to assess therapeutic efficacy of antimuscarinic treatment for female OAB. Besides, bladder blood perfusion and sexual function did not change after treatment. Tolterodine did not change bladder wall blood perfusion, and did not improve or deteriorate sexual function.

Concluding message

Detrusor wall thickness, bladder blood perfusion and sexual function did not change after tolterodine treatment for female OAB. Detrusor wall thickness is not a good tool to assess therapeutic efficacy of tolterodine treatment. Tolterodine treatment might not deteriorate or improve female sexual function.

Table 1. Baseline data of women with overactive bladder (n=41)

Variables	Value
Age (years)	53.2±11.6
Parity	2.4±1.3
Diabetes	3 (7)
Body mass index (kg/m ²)	24.8±3.5
PPBC	4.3±1.0
OABSS	6.0±3.7
USS	2.2±1.0
UDI-6	5.9±3.5
IIQ-7	6.9±5.4
FSFI	
Desire	2.1±0.7
Arousal	2.8±0.8
lubrication	3.6±1.0
Orgasm	3.3±0.9
Satisfaction	3.9±1.0
Pain	4.0±1.4
Average FSFI score	3.3±0.7
DWT	
Anterior wall (cm)	0.54±0.12
Trigone (cm)	0.56±0.13
Dome (cm)	0.54±0.12
Average DWT (cm)	0.55±0.12
BWV (cm ³)	35.0±15.5
VI	0.40±0.57
FI	30.3±6.9
VFI	0.15±0.28

Values were expressed with mean \pm standard deviation or number (percentage). BWV=bladder wall volume; DWT=detrusor wall thickness; FI=flow index; FSFI=Female Sexual Function Index; IIQ-7=Incontinence Impact Questionnaire-7; OABSS=Overactive Bladder Symptoms Scores; PPRC=Patient Perception of Bladder Condition; UDI-6=Urogenital Distress Inventory-6; USS=Urgency Severity Scale; VFI= vascularization-flow index; VI=vascularization index.

Table 2. Correlation of average bladder wall thickness, bladder wall volume, bladder wall blood perfusion and female sexual function for women with overactive bladder wall syndrome (n=41)

Variables	DWT		BWV		VI		FI		VFI	
	Rho	†P	Rho	†P	Rho	†P	Rho	†P	Rho	†P
PPBC	0.03	0.88	0.17	0.34	-0.10	0.58	-0.00	0.98	-0.09	0.61
OABSS	0.20	0.24	0.32	0.06	0.11	0.53	0.05	0.80	0.09	0.59
USS	0.22	0.26	0.05	0.79	0.13	0.52	-0.02	0.92	0.11	0.57
UDI-6	0.08	0.66	0.11	0.52	-0.10	0.57	-0.11	0.52	-0.09	0.62
IIQ-7	0.08	0.65	0.06	0.74	-0.07	0.70	0.02	0.89	-0.05	0.76
FSFI	0.29	0.25	-0.13	0.59	0.06	0.82	-0.06	0.81	0.08	0.77

The abbreviations were the same as in Table 1. †By Spearman's correlation test.

Table 3. Comparisons of baseline data and changes from baseline after 3 months' tolterodine treatment (n=41)

Variables	Baseline	Post-treatment	†P
PPBC	4.3 \pm 1.0	2.6 \pm 1.2	<0.0001
OABSS	6.0 \pm 3.7	4.3 \pm 3.0	0.003
USS	2.2 \pm 1.0	1.4 \pm 0.9	0.13
UDI-6	5.9 \pm 3.5	2.9 \pm 2.6	0.0003
IIQ-7	6.9 \pm 5.4	3.4 \pm 4.2	0.0006
FSFI			
Desire	2.1 \pm 0.7	2.4 \pm 0.5	0.55
Arousal	2.8 \pm 0.8	2.7 \pm 1.0	0.54
lubrication	3.6 \pm 1.0	3.4 \pm 1.2	0.47
Orgasm	3.3 \pm 0.9	3.3 \pm 1.1	0.49
Satisfaction	3.9 \pm 1.0	4.0 \pm 1.1	0.15
Pain	4.0 \pm 1.4	4.1 \pm 1.3	0.84
Average FSFI score	3.3 \pm 0.7	3.3 \pm 0.8	0.61
DWT			
Anterior wall (cm)	0.54 \pm 0.12	0.52 \pm 0.11	0.58
Trigone (cm)	0.56 \pm 0.13	0.57 \pm 0.13	0.54
Dome (cm)	0.54 \pm 0.12	0.53 \pm 0.11	0.97
Average DWT (cm)	0.55 \pm 0.10	0.54 \pm 0.10	0.83
BWV (cm ³)	35.0 \pm 15.5	43.8 \pm 24.0	0.25
VI	0.40 \pm 0.57	0.39 \pm 0.91	0.84
FI	30.3 \pm 6.9	28.8 \pm 9.6	0.54
VFI	0.15 \pm 0.28	0.17 \pm 0.52	0.64

Values were expressed with mean \pm standard deviation. The abbreviations were the same as in Table 1. †By Wilcoxon sign-rank test.

References

1. Hsiao SM, Su TC, Chen CH, Chang TC, Lin HH. Autonomic dysfunction and arterial stiffness in female overactive bladder patients and antimuscarinics related effects. *Maturitas* 2014;79:65-9.

Disclosures

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