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EFFICACY AND SAFETY OF BOTULINUM TOXIN A TREATMENT FOR PATIENTS WITH DETRUSOR OVERACTIVITY AND INADEQUATE CONTRACTILITY

Hypothesis / aims of study
The aim of the study was to investigate the efficacy and safety of onabotulinumtoxinA intravesical injection for patients with detrusor overactivity and inadequate contractility (DHIC).

Study design, materials and methods
A total of 21 patients with urodynamically proved DHIC and 21 age-matched overactive bladder (OAB) patients with urodynamic detrusor overactivity (DO) were retrospectively analyzed. Patients were treated with suburothelial injection of 100U onabotulinumtoxinA at 20 sites. All subjects were evaluated with overactive bladder symptom score, urgency severity score, patient perception of bladder condition, global response assessment, voiding diary and procedures-related adverse events (AE) at baseline, 2 weeks, 1, 3 and 6 months after treatment.

Results
The results showed that the subjective symptom scores were significantly improved in both groups and no difference between groups. However, the changes of urgency episodes and urge urinary incontinence were noted only in OAB patients but not in DHIC patients. Acute urinary retenion was noted in 7 (33.3%) and 3 (14.3%) patients, large postvoid residual volume >200 mL in 12 (57.1%) and 7 (33.3%) patients, and urinary tract infection in 8 (38.1%) and 4 (19.0%) patients of DHIC and OAB patients, respectively (all p>0.05). Though the incidence of AEs were comparable between groups, the therapeutic efficacy lasted for a mean of 4.9 months in DHIC patients and 7.3 months in OAB patients (p=0.077).

Interpretation of results
To our knowledge, we first reported the therapeutic outcome and safety of intravesical onabotulinumtoxinA injection for patients with DHIC. The results of this study revealed that patients with DHIC did not significantly increase the risk of large PVR or decrease of VE after 100U onabotulinumtoxinA injection. However, although subjective urgency symptom score improved, the episodes of urgency, frequency or UUI did not change after onabotulinumtoxinA injection. The therapeutic efficacy was significantly diminished in DHIC patients. A hypothesis has been proposed that chronic untreated or treatment refractory OAB progression to the development of DHIC and subsequently progression to UAB with time. Although the AEs did not significantly increase in DHIC patients, the relatively higher rates of AEs and shorter therapeutic duration still need attention when onabotulinumtoxinA injection is recommended to patients with DHIC.

Concluding message
The efficacy of onabotulinumtoxinA intravesical injection for DHIC patients was limited and short-term. Nevertheless, AE did not increase in DHIC patients. Physicians may inform the potential benefits and risks for DHIC patients before onabotulintoxinA injection.

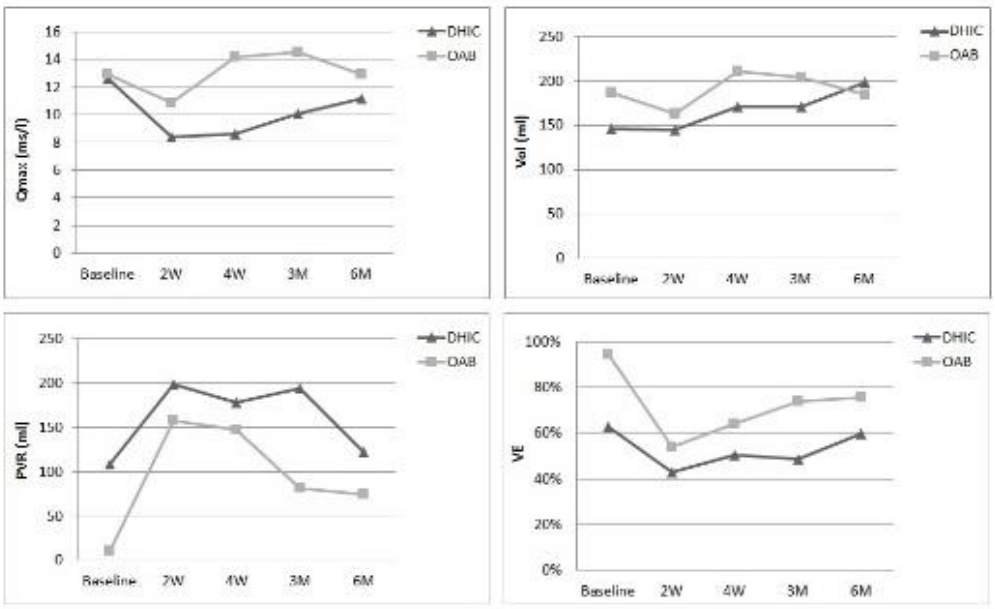

Fig.1. The changes of maximum flow rate (Qmax), voided volume (vol), postvoid residual volume (PVR) and voiding efficiency (VE) at different time-points in patients with detrusor overactivity and impaired contractility (DHIC) and overactive bladder (OAB) from baseline to 6 months.

Table 1. The measured parameters of patients with DHIC and OAB at baseline and at 2 weeks, 4 weeks, 3 months and 6 months after 100 U BoNT-A injection

		Baseline	2 weeks	4 weeks	3 months	6 months
OABSS	DHIC	12.3 ± 2.0	11.1±2.56*	10.1 ±2.77*	10.1±3.80*	9.61±3.24*
	OAB	11.2 ± 2.9	9.48 ±3.2*	9.52 ±2.96*	9.19 ±2.87*	8.06 ±3.3*
USS	DHIC	4.0 ± 0	3.48 ±0.87*	3.40±0.88*	3.7±0.92	3.28±0.96*
	OAB	3.62 ±0.74	3.14 ±1.1*	3.29 ±1.01*	3.10 ±1.0*	3.06±1.06*
GRA	DHIC	0	1.19 ±1.33*	1.30 ±1.38*	1.10 ±1.74*	1.50 ±1.47*
	OAB	0	0.95 ±1.28*	1.43 ±1.12*	1.52 ±0.81*	1.72 ±0.96*
PPBC	DHIC	4.67 ±1.77	3.90 ±1.70	3.25 ±1.65*	3.15 ±1.76*	2.89 ±1.75*
	OAB	4.52 ±1.66	3.10 ±1.61*	2.48 ±1.47*	2.81 ±1.63*	2.56 ±1.29*
UUI	DHIC	7.44 ± 9.51	6.67 ± 11.1	5.84 ± 9.22	12.3 ± 20.9	9.53 ± 19.6
/ 3days	OAB	6.0 ±13.6	3.65 ± 7.39	4.70 ± 9.09	3.62 ±8.13*	2.88 ± 2.03
Urgency	DHIC	27.7 ±17.7	27.9 ± 23.4	29.8 ± 30.2	27.5 ± 28.2	29.1± 33.5
/ 3days	OAB	27.3 ±15.0	22.4 ±14.5*	19.9 ±15.7*	26.9 ±19.8	15.1±11.9*
Frequency	DHIC	26.6 ±14.2	30.0 ±14.4	31.1 ± 24.6	28.6 ± 22.4	29.7 ± 28.9
/ 3 days	OAB	38.0 ±12.9	37.6 ±22.5	31.5 ± 9.27	36.5 ±19.8	31.4 ±12.3*
Nocturia	DHIC	10.5 ±5.41	9.39 ±3.29	8.16 ±3.01	8.50 ±2.09	7.59 ±3.12*
/ 3 days	OAB	11.4 ±5.40	9.80 ±4.57	8.55 ±3.80*	10.5 ±5.0	9.44 ±3.01
Bladder	DHIC	287 ±137	266 ±125	314 ±149	299 ±126	315 ±130
capacity (mL)	OAB	302 ±91	285 ± 97	290 ±127	299 ±137	331 ±79
Qmax (mL/s)	DHIC	12.6±10.7	8.43 ± 4.23	8.62 ± 3.34	10.1±5.32	11.2±6.33
	OAB	12.9 ±7.1	10.9 ±7.9	14.2 ±7.02	14.5 ±8.54	12.9 ±8.2
Voided volume	DHIC	146 ± 69	146 ± 97	171 ± 99	171 ±125	199 ± 126
(mL)	OAB	187 ±106	164 ±136	212 ± 93	205 ± 96	185 ± 106
PVR (mL)	DHIC	109 ±149	199 ±118*	179 ± 93*	194 ± 150	123 ± 79
	OAB	11 ±15	158 ±184*	147 ±123*	81 ± 75*	75 ±72*
VE (%)	DHIC	62.7 ± 24.8	42.9 ± 24.8*	50.2± 19.8*	48.6±26.8	59.7±20.1*
	OAB	94.6 ± 7.9	54.1 ± 29.4*	64.2 ±21.8*	73.6 ±20.1*	75.4±22.4*

BoNT-A: onabotulinumtoxinA, DHIC: detrusor overactivity and impaired contractility, GRA: global response assessment, OAB: overactive bladder, OABSS: overactive bladder symptom score, PPBC: patient perception bladder condition, PVR: post-void residual volume, Qmax: maximal urinary flow rate, USS: urgency severity score, UUI: urgency urinary incontinence, VE: voiding efficacy, *: significantly different from baseline

Table 2. Comparison of the adverse events and therapeutic duration of patients with DHIC and OAB after 100 U BoNT-A injection

	DHIC (n=21)	OAB (n=21)	P value
AUR	7 (33.3%)	3 (14.3%)	0.277
PVR >200 mL	12 (57.1%)	7 (33.3%)	0.215
UTI	8 (38.1%)	4 (19.0%)	0.306
Gross hematuria	0 (0%)	1 (4.8%)	1.000
General weakness	1 (4.8%)	0 (0%)	1.000
Therapeutic duration (months)	4.9 ± 4.8	7.3 ± 3.7	0.077

AUR: acute urinary retention, DHIC: detrusor overactivity and impaired contractility, OAB: overactive bladder, PVR: post-void residual volume, UTI: urinary tract infection

Disclosures
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