

Author Year; Country Score Research Design Sample Size	Methods	Outcome
<p>Fougere et al. 2016 Canada Pre-post N=17</p>	<p>Population: N=17 (12M, 5F) with chronic traumatic SCI at or above T6 and concomitant autonomic dysreflexia and neurogenic detrusor overactivity Mean (SD) age: 44 (10) Mean (SD) years post injury: 21 (11) AIS-A/B/C = 9/5/3 11 cervical, 6 thoracic</p> <p>Treatment: One cycle of Botox injection (200U in 20mL 0.9% saline, injected into 20 sites of detrusor muscle), 2wk after baseline measurements & 1mo before post-treatment measurements</p> <p>Outcome Measures: Urodynamic studies (UDS), 24h ambulatory BP monitoring (ABPM), AD Health-related QoL questionnaire, I-QOL questionnaire</p>	<ol style="list-style-type: none"> 1. Pre vs. post-botox during UDS (mean \pm SD): Significantly lower SBP (mmHg) at: First urge to preform CIC (112 ± 17 vs. 114 ± 14), at max volume infused (151 ± 25 vs. 133 ± 17), and at max SBP (153 ± 25 vs. 134 ± 16) Significantly lower ΔSBP* (mmHg) at: First urge to preform CIC (34 ± 20 vs. 15 ± 11), at max volume infused (40 ± 24 vs. 18 ± 12), and at max SBP (42 ± 23 vs. 20 ± 10) Significantly lower ΔHR (bpm) at: First urge to preform CIC (-8 ± 11 vs. -6 ± 10), at max volume infused (-17 ± 12 vs. -9 ± 14), and at max SBP (-16 ± 13 vs. -8 ± 14) 2. Pre vs. post-botox during bladder events (mean \pm SD, from 24h ABPM): Significantly reduced max SBP (157 ± 21 vs. 139 ± 21) & ΔSBP** during CIC 3. AD eliminated in 10 participants (ΔSBP < 20 mmHg), attenuated in 7 4. Significantly fewer participants reporting AD symptoms post-botox (15 to 9) 5. Significantly reduced frequency of AD during CIC post-treatment (67% to 25%) 6. Significant improvement in all subsections and in total scores of QoL measures <p>*change in measure vs. supine baseline **change in measure vs. seated baseline CIC = clean intermittent catheterization</p>
<p>Chen & Kuo 2012; Taiwan Pre-post N=49 (with AD=34)</p>	<p>Population: 49 patients (31M, 18F) with SCI and detrusor sphincter dyssynergia; Level of SCI: 27 cervical, 22 thoracic; mean age in yrs: 41.6, range 22-74; mean DOI in yrs: 8, range 1-35.</p> <p>Treatment: Patients received two sets of 200 U BoNT-A injections into the detrusor at baseline and 6 months later.</p> <p>Outcome Measures: Improvement in the severity of AD; net change in the grade of incontinence; net changes in the scores of the Urogenital Distress Inventory (UDI-6); Incontinence Impact Questionnaire; quality of life index; urodynamic parameters.</p>	<ol style="list-style-type: none"> 1. 15 patients did not have AD at baseline or after treatment. 2. AD was completely resolved in 3 patients, and improved in 18; treatment made no difference in 3 patients and AD was exacerbated in 10. 3. No significant differences in any urodynamic variables between patients with and without AD. 4. A significantly greater improvement in the UDI-6 was noted in patients without AD and those in whom AD improved than in those with AD. Occurrence of AD was not significantly associated with persistent urinary incontinence after the BoNT-A injections. 5. No significant difference in the quality of life index between patients with and without AD at the end point.

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Chen et al. 2008; Taiwan Pre-post N=20 (with AD=4)	<p>Population: 20 suprasacral SCI subjects with detrusor external sphincter dyssynergia (DESD); Mean age 37.9 (15.7); 17 male; 12 cervical, 3 thoracic, 5 lumbar; AIS diagnosis: 11 AIS-A, 2 AIS-B, 4 AIS-C, 3 AIS-D.</p> <p>Treatment: A single dose of 100 IU botulinum toxin A was applied into the external urethral sphincter via cystoscopy.</p> <p>Outcome Measures: maximal detrusor pressure, maximal urethral pressure, maximal detrusor leak point pressure, integrated electromyography (IEMG) of the external urethral sphincter and, maximal pressure on static urethral pressure profilometry, recorded before and 4 weeks after the injection; post-voiding residues, measured 1, 2, 3, and 6 months post-injection.</p>	<ol style="list-style-type: none"> 4 patients who had AD symptoms before treatment reported decreased frequency and intensity of AD. There was significant reduction in the IEMG (from 16.7(13.6) to 12.5(12.9) uV), as well as static urethral pressure (from 139.4(40.5) to 104.8(30.5) cmH₂O) and maximal urethral pressure (from 107.5(69.1) to 80.2(35.7) cmH₂O). There was no significant difference in the maximal detrusor pressure or detrusor leak point pressure. Post-voiding residues were significantly reduced at 1st, 2nd, 3rd, and 6th months post-injection.
Kuo 2008; Taiwan Pre-post N=33 (with AD=6)	<p>Population: 33 subjects suffering from detrusor sphincter dyssynergia and urinary incontinence (including 9 individuals with cervical SCI, 12 with thoracic SCI, 5 with lumbar SCI, 5 multiple sclerosis and 2 transverse myelitis patients); age range 23-71.</p> <p>Treatment: transurethral sphincter botox injections, injecting 100 units of botox in 4 ml normal saline into eight sites of the urethral sphincter.</p> <p>Outcome Measures: video-urodynamic studies; Urogenital Distress Inventory short form (UDI-6); Incontinence Impact Questionnaire (IIQ-7) short form.</p>	<ol style="list-style-type: none"> 3/6 patients experienced decreased symptoms of AD post-treatment. Urodynamic parameters showed significant improvement in voiding detrusor pressure (45.7(22.7) vs. 30.7(15.5) cmH₂O), maximum flow rate (6.8(5.7) vs. 9.2(7.7) ml/sec) and post-void residual volume (160(124) vs. 75(105) ml). IIQ-7 scores were significantly improved, but not the UDI-6 scores.
Schurch et al. 2000; Switzerland Pre-post N initial=31 N final=19	<p>Population: Mean age: 36.7 yrs, mean DOI=60.2 months; 18 subjects with paraplegia, 3 with tetraplegia, 17 subjects with complete injuries, 4 with incomplete injuries, incontinence resistant to anticholinergic medication.</p> <p>Treatment: Botulinum-A toxin was injected (200-300 units) into the detrusor muscle.</p> <p>Outcome Measures: voiding and detrusor pressure, diary of incontinence, AD symptoms at 6, 16, and 36-wks.</p>	<ol style="list-style-type: none"> At 6-week follow-up 17/19 patients were completely continent. 3 patients with tetraplegia with severe AD with bladder emptying found this disappeared after treatment.
Dykstra et al. 1988; USA Pre-post N=11 (with AD=7)	<p>Population: Detrusor-sphincter dyssynergia</p> <p>Treatment: low dose botulinum A toxin at the neuromuscular junction.</p> <p>Outcome Measures: urethral pressure, symptoms of AD.</p>	<ol style="list-style-type: none"> Urethral pressure profile decreased 27 cm H₂O (n=7). Self-assessed improvement of AD symptoms in 5 of 7 AD patients. Toxin effects lasted an average of 50 days.