Author Year; Country Score Research Design Sample Size	Methods	Outcome
Huang et al. 2024 China Pre-post Level 4 N=25	**Population:** N=25 people with SCI at or above T6 **Treatment:** SBP, scores of the Incontinence Specific Quality of Life Instrument, maximum detrusor pressure at first detrusor overactivity, and volume at first detrusor overactivity were measured at baseline and 3 months after the treatment. Participants were injected with 200 U BTX-A. **Outcome measures:** Overall maximum sBP, frequency of AD, scores of Incontinence Specific Quality of Life Instrument, maximum detrusor pressure, and volume at first detrusor overactivity.	1. BTX-A injection decreased maximum sBP and change in sBP during urodynamic studies (151.44 ± 13.92 vs 133.32 ± 9.20 mmHg and 49.44 ± 12.81 vs 33.08 ± 9.11 mmHg respectively, $P < 0.05$.) 2. The frequency of bladder-related ADs significantly decreased from 11.04 ± 1.81–7.88 ± 2.15 ($P < 0.001$) after BTX-A injection.
Fougere et al. 2016 Canada Pre-post Level 4 N=17	**Population:** N=17, 12 males, 5 females 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 **Treatment:** One cycle of Botox injection (200U in 20mL 0.9% saline, injected into 20 sites of detrusor muscle), 2 weeks after baseline measurements & 1 month	1. Pre vs. post-botox during UDS (mean±SD): 2. Significantly lower SBP (mmHg) at: a. 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). 3. Significantly lower ΔSBP (mmHg) from supine baseline at: a. 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). 4. Significantly lower ΔHR (bpm) at:

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	before post-treatment measurements CIC = clean intermittent catheterization **Outcome Measures:** Urodynamic studies (UDS), 24h ambulatory BP monitoring (ABPM), AD Health-related QoL questionnaire, I-QOL questionnaire	a. 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). 5. Pre vs. post-botox during bladder events (mean±SD, from 24h ABPM): 6. Significantly reduced max SBP (157±21 vs. 139±21) & ΔSBP from seated baseline during CIC. 7. AD eliminated in 10 participants (ΔSBP <20mmHg), attenuated in 7. 8. Significantly fewer participants reporting AD symptoms post-botox (15 to 9) (p=0.034). 9. Significantly reduced frequency of AD during CIC post-treatment (67% to 25%) (p<0.001). 10. Significant improvement in all subsections and in total scores of QoL measures.
Chen & Kuo 2012 Taiwan Pre-post Level 4 N=49 (with AD=34)	**Population:** 49 patients (31 males, 18 females) with SCI and detrusor sphincter dyssynergia; Level of SCI: 27 cervical, 22 thoracic; mean age in years: 41.6, range 22-74; mean DOI in years: 8, range 1-35. **Treatment:** Patients received two sets of 200 U BoNT-A injections into the detrusor at baseline and 6 months later.	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.

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	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.	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 (p=0.035). 5. Occurrence of AD was not significantly associated with persistent urinary incontinence after the BoNT-A injections. 6. No significant difference in the quality of life index between patients with and without AD at the end point.
Chen et al. 2008 Taiwan Pre-post Level 4 N=20 (with AD=4)	**Population:** 20 suprasacral SCI participants 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. **Treatment:** A single dose of 100 IU botulinum toxin A was applied into the external urethral sphincter via cystoscopy. **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	1. 4 individuals who had AD symptoms before treatment reported decreased frequency and intensity of AD. 2. There was significant reduction in the IEMG (from 16.7(13.6) to 12.5(12.9) uV (p=0.023)), as well as static urethral pressure (from 139.4(40.5) to 104.8(30.5) cmH_2O (p=0.004)) and maximal urethral pressure (from 107.5(69.1) to 80.2(35.7) cmH_2O (p=0.049)). 3. There was no significant difference in the maximal detrusor pressure or detrusor leak point pressure. 4. Post-voiding residues were significantly reduced at 1st, 2nd, 3rd, and 6th months post-injection.

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	residues, measured 1, 2, 3, and 6 months post-injection.	
Kuo, 2008 Taiwan Pre-post Level 4 N=33 (with AD=6)	**Population:** 33 participants with 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. **Treatment:** transurethral sphincter botox injections, injecting 100 units of botox in 4 ml normal saline into eight sites of the urethral sphincter. **Outcome Measures:** video-urodynamic studies; Urogenital Distress Inventory short form (UDI-6); Incontinence Impact Questionnaire (IIQ-7) short form.	1. 3/6 patients experienced decreased symptoms of AD post-treatment. 2. Urodynamic parameters showed significant improvement in voiding detrusor pressure (45.7(22.7) vs. 30.7(15.5) cmH_2O), 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). 3. IIQ-7 scores were significantly improved, but not the UDI-6 scores.
Schurch et al. 2000 Switzerland Pre-post Level 4 N initial=31 N final=19	**Population:** Mean age: 36.7 yrs, mean DOI=60.2 months; 18 participants with paraplegia, 3 with tetraplegia, 17 participants with complete injuries, 4 with incomplete injuries, incontinence resistant to anticholinergic medication. **Treatment:** Botulinum-A toxin was injected (200-300 units) into the detrusor muscle. **Outcome Measures:** voiding and detrusor pressure, diary of incontinence, AD symptoms at 6, 16, and 36-wks.	1. At 6-week follow-up, 17/19 patients were completely continent. 2. 3 patients with tetraplegia with severe AD with bladder emptying found this disappeared after treatment.

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Dykstra et al. 1988 USA Pre-post Level 4 N=11 (with AD=7)	**Population:** Detrusor-sphincter dyssynergia **Treatment:** low dose botulinum A toxin at the neuromuscular junction. **Outcome Measures:** urethral pressure, symptoms of AD.	1. Urethral pressure profile decreased 27 cm H_20 (n=7). 2. Self-assessed improvement of AD symptoms in 5 of 7 AD patients. 3. Toxin effects lasted an average of 50 days.