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A SINGLE SURGEON'S EXPERIENCE USING BOTULINUM TOXIN A INJECTIONS FOR NEUROGENIC DETRUSOR OVERACTIVITY. PRELIMINARY RESULTS.

Hypothesis / aims of study

Intermittent catheterization associated with antimucarinic medication is the standard treatment for neurogenic detrusor overactivity (NDO) (1). However severe NDO is frequently resistant to this treatment or patients cannot tolerate the side effects (2). Nowadays Botulinum Toxin A (BTX-A) endoscopic treatment is considered a minimally-invasive second line treatment for these kinds of patients. This study evaluates the efficacy, safety and clinical outcomes of BTX-A in patients with NDO, incontinence and/or frequency/urgency.

Study design, materials and methods

26 patients with NDO refractory to anticholinergics, incontinence and/or frequency/urgency were enrolled in this prospective single center study. All of them had symptoms for at least 6 months. 300 units BTX-A (Botox ®) were injected into the detrusor muscle via rigid cystoscopy into 30 sites. Baseline and 2 months postoperative evaluation included: bladder diary, conventional urodynamic study (including reflex volume, maximum cystometric capacity, maximum pressure of uninhibited detrusor contraction, post void residual) and renal/bladder ultrasound. Patients were told to reduce the dose or stop the use of anticholinergics after the injections. Complications were also charted. All the injections and follow-up procedures were done by the same surgeon.

Results

26 patients underwent a complete examination 2 months after the BTX-A injections. (Table 1). The mean length of the illness was 11.2 years. Clearly decreased incontinence was achieved in 12/26 (46%) patients and complete continence was restored in 11/26 (42%). In 3 patients (12%) did not experience any improvement. Following treatment all urodynamics variables showed significant improvement. (Table 2). The effect of BTX-A injections had mean time duration of 7.6 months. NDO was abolished in 10/26 (38%) patients. 11/26 (42%) patients were able to reduce the dose or stop anticholinergics medications. 3/8 (37%) patients with spontaneous voiding started using clean intermittent catheterization (CIC) after the treatment. Of the 3 patients who showed different degrees of hydronephrosis, 2 cases resolved and 1 had a decrease in severity. The therapy was accepted by many patients and 23/26 (88%) would agree to a repeat treatment. 25/26 (96%) patients would recommended the therapy to another patient with similar conditions. Subjectively the initial effect of the therapy was experienced at 17 ± 9 (7-30) days after injections and the greatest effect was experienced at 31 ± 12 (12-60) days. 7 patients received a second injection reporting a similar improvement at an average of 8.3 months after the first injection. No patient reported severe adverse events. Transient upper body weakness was reported in one subject with spinal cord injury, 1/26 (3.8%)

Table 1.

Demographic Characteristics	No. of patients
Mean age (Years)	45.2 ± 6.3 (19-70)
Sex (Male/Female)	14/12
Neurogenic Disorder %	
• Spinal Cord Injury	15 (57.7%)
• Cerebrovascular accident	5 (19.2%)
• Multiple Sclerosis	4 (15.4%)
• Spina Bifida	2 (7.7%)

Table 2. The following table summarizes the clinical and urodynamic parameters at baseline and 2 months after BTX-A injections.

Parameter	No. of patients	Baseline Mean ± SD (range)	2 Mo Post BTX-A Injections Mean ± SD (range)	p- Value
Incontinence episodes/24 hrs	26	5.7±1.8 (3-9)	1.8 ± 1.6 (0-7)	p < 0.0001*
Pads used/24hrs	26	4.3 ± 2.0 (1-10)	1.8 ± 1.7 (0-7)	p < 0.0001*
Catheterization frequency/24hrs	16	4.9 ± 1.8 (2-8)	3.4 ± 0.7 (2-4)	p = 0.001*
Reflex volume (ml)	26	162 ± 70 (63-330)	335 ± 123 (70-500)	p < 0.0001*
Max pressure of UDC (cm H2O)	26	66.8 ± 25.2 (21-110)	33.2 ± 20.6 (0-85)	p = 0.0002*
Max cystometric capacity (ml)	26	252 ± 134 (70-480)	364 ± 100 (170-500)	p = 0.0003*
Residual volume (ml)	26	87 ± 79 (0-300)	259 ± 172 (0-500)	p < 0.0001*
Detrusor Overactivity	26	100%	62%	p = 0.0007‡

Abbreviations: UDC, uninhibited detrusor contractions. * Student t test ‡ Fisher's exact test

Interpretation of results

300 units of BTX-A injected into the detrusor muscle improves all urodynamic parameters, including: reflex volume, maximum cystometric capacity, maximum pressure of uninhibited detrusor contractions and residual volume. Clinical outcomes assessed via bladder diary also improved: incontinence episodes/24 hrs, No. pads/24 hrs, No. CIC/24 hrs. Some of the patients who were spontaneously voiding prior to the treatment had to start CIC postoperatively. This may be because the dose of 300 units of BTX-A in these patients is too high. However all of these patients agreed to eventually repeat the treatment. No serious adverse events were reported, contributing to the safety of this treatment. However longer follow-up is needed to determinate if this therapy is an alternative treatment to invasive procedures or a way to postpone the need for a more invasive surgery.

Concluding message

Treatment with 300 units of BTX-A by cystoscopic intradetrusor injections for NDO refractory to antimuscarinic therapy is a safe procedure and provides a clear efficacy improving urodynamic parameters and clinical outcomes. Further prospective randomized multicenter trials with long term follow-up are warranted to better assess this therapy.

References

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Is this study registered in a public clinical trials registry?	**No**
Is this a Randomised Controlled Trial (RCT)?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**Research Ethics Board. INAREPS**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**