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DETRUSOR INJECTIONS WITH BOTULINUM A TOXIN – COMPARISON OF PATIENTS WITH CONGENITAL SPINAL CORD DEFECTS AND TRAUMATIC SPINAL CORD INJURIES

Hypothesis / aims of study

Multifocal intramural detrusor injections with botulinum A toxin are an effective treatment for refractory neurogenic detrusor overactivity in spinal cord injured patients [1,2]. Comparable efficacy in children with neurogenic conditions was reported [3,4].
This study compares our experience in patients with congenital or traumatic spinal cord injuries (SCI).

Study design, materials and methods

Thirty-eight patients with congenital spinal defects and 71 patients with SCI were selected from our data base of detrusor injection treatments with botulinum A toxin. The patient data are presented in table 1.

Table 1. Demographic data

	Congenital						SCI	
	Myelomeningocele		Spina bifida		Other			
Male	12		9		2		55	
Female	8		5		2		16	
Total	**20**		**14**		**4**		**71**	
Complete lesion	5		4		-		46	
Incomplete lesion	15		10		4		25	
	Mean	Range	Mean	Range	Mean	Range	Mean	Range
Age (years)	18.9	6-35	21.6	10-40	17.4	4-30	37.8	19-77
Duration of injury	equal to age						8.9	0.2-40

The injection technique used has been described earlier [1,2]. Botox® was dosed at 100-300 UI depending on age and Dysport® at 750 UI and 1000 UI.
The urodynamic parameters cystometric capacity, overactivity volume (volume at first occurrence of detrusor overactivity), and detrusor compliance, the clinical continence volume, clinical functional capacity, and clinical maximum capacity, the anticholinergics dosage, and the patients' subjective satisfaction were recorded before and after treatment.
Statistical comparisons were made by t-tests between the patient groups and by paired t-tests between pre- and post-treatment data. The incidences of incontinence and of anticholinergics use were compared by the χ^2-test. In all cases the two-sided significance level was set at p=0.05.

Results

At baseline all patients used aseptic intermittent catheterisation for bladder emptying, the majority was on high dose anticholinergics.
The average total follow up from the first treatment was 26.1 months for congenital patients and 61.6 months for SCI patients. During this period the congenital patients received an average of 1.8 (1-4) treatments and the SCI patients 2.7 (1-7) treatments. Only 13/38 patients with congenital pathology opted for one or more repeat treatments, against 52/71 of the SCI patients. This difference is significant (p=0.0000). The average interval between the first and the second treatment was 9.7 (2-18) months in the congenital and 11.2 (1-33) months in the SCI patients. The difference was not significant (p=0.4764). A third injection was performed in 5 congenital patients after 9.5 (5-13) months and in 34 SCI patients after 10.3 (3-23) months. These differences again are not significant (incidence p=0.0764, interval p=0.7040)
The comparisons between the pre- and the post-treatment data after the first treatment are given in table 2.

Table 2. Result of treatment.

		Congenital (n=38)			Acquired (n=-71)			Between groups	
		Pre	Post	p	Pre	Post	p	pre	post
Cystometric capacity (ml)		265	276	0.4948	310	393	**0.0003**	0.2500	**0.0016**
Overactivity volume (ml)	Not present	7	8	0.7732	11	12	0.8198	0.6948	0.5936
	Present	132	224	**0.0032**	211	310	**0.0039**	**0.0047**	**0.0240**
Detrusor compliance (ml/cm H_2O)		11.6	14.6	**0.0091**	26.7	34.3	0.4557	**0.0000**	**0.0007**
Clinical continence volume (ml)		191	256	**0.0031**	253	368	**0.0000**	0.1156	**0.0106**
Clinical functional capacity (ml)		241	298	**0.0035**	300	383	**0.0013**	0.1506	**0.0213**
Clinical maximal capacity (ml)		316	359	0.2401	367	473	**0.0013**	0.3461	**0.0205**
Anticholinergics use		30	21	**0.0280**	65	27	**0.0000**	0.0609	0.0841
Anticholinergics dose reduction			4			15			
Satisfaction (very) good/minimal/not			12/9/13			49/12/10			
			Mean	Range		Mean	Range		
Follow up interval (months)			5.0	1-12		6.9	1-22		

Interpretation of results

The treatment with botulinum A toxin detrusor injections in patients with congenital spinal defects appears less promising than in patients with traumatic spinal cord injury. Although the average interval between the first and the second treatment is comparable, a much larger proportion of patients does not continue botulinum treatment within a relatively short period.
This might be explained by the fact that the improvement of the patients' condition and the patients' satisfaction all are much smaller than for traumatic spinal cord patients (table 2).
The fact that at baseline the overactivity volume and the detrusor compliance in this study group is much smaller than in patients with traumatic spinal cord injury might suggest a reason for the low response.

Concluding message

Basic research might be suggested to search for the reason of this difference in response to botulinum A toxin injections in the detrusor. After that a possible adaption of the toxin dosage or the injection modalities may be considered.

References

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