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DETRUSOR INJECTIONS WITH BOTULINUM A TOXIN ARE PROBABLY NOT EFFECTIVE IN PATIENTS WITH CONGENITAL SPINAL CORD DEFECTS

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]. A preliminary paper reported a comparable efficacy in children with myelomeningocele at 2-4 weeks after treatment [3].

This study presents data with longer follow up in children and young adults with myelomeningocele or spina bifida.

Methods

Fourteen patients with myelomeningocele and five with spina bifida were selected from our data base of detrusor injection treatments with botulinum A toxin. The patient data is presented in table 1.

The injection technique used has been described earlier [1,2]. Botox® was dosed at 100 UI for 2 young children, at 200 UI for 5 youngsters, and at 300 UI for adults. Two myelomeningocele patients were treated with Dysport® 750 UI in a 23-year old and 1000 UI in a 16-year old.

The urodynamic parameters cysto-metric capacity, overactivity volume (volume at first occurrence of detrusor overactivity), and bladder 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.

Table 1. Patient demographic data

	Myelo-meningocele		Spina bifida	
Male	8		4	
Female	6		1	
Total	**14**		**5**	
Complete lesion	4		1	
Incomplete lesion	10		4	
Age (years)	Mean 11.6	Range 6-29	Mean 9.2	Range 2-16

Statistical comparisons were made by t-tests between the patient groups and by paired t-tests be-tween 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

The pre-treatment and the first post-treatment data were compared between the patients with myelomeningocele and those with spina bifida. As these data showed no significant differences (t-tests, minimal p=0.3687; clinical continence volume), the data then were pooled.

All patients used aseptic intermittent catheterisation for bladder emptying, 14 patients were on high dose anticholinergics.

The average follow up duration from the first treatment was 10.9 months (range 1-36 months) for 17 patients; two myelomeningocele patients were treated recently and have no follow up data yet.

The comparisons between the pre- and the post-treatment data after the first treatment are given in table 2. Not all patients had a second observation after this treatment.

The patients who had a second evaluation obviously had much better baseline values — this explains the higher values of the data without the changes being significant.

A second treatment with Botox® was performed in six patients after the effect of the first treatment had faded out. The average interval between the first and the second treatment

was 11.7 months (range 7-18 months). Eleven patients were referred to other treatments 1-16 months after the injection (mean 6.0 months). The second treatment did not improve the condition of the patients compared to the baseline. None of the data changed significantly.

Table 2. Result of treatment.		Pre	Post 1	p	Post 2	p	Statistic
Cystometric capacity (ml)		238	257	**0.0043**	271	0.5414	Paired t-test
Overactivity volume (ml)	Not present	5	3	0.5323	1	0.4304	$?^2$-test
	Present	122	213	**0.0010**	234	**0.0174**	Paired t-test
Bladder compliance (ml/cm H_2O)		9.8	14.3	**0.0000**	16.3	0.0621	Paired t-test
Clinical continence volume (ml)		200	263	**0.0219**	278	**0.0419**	Paired t-test
Clinical functional capacity (ml)		238	283	**0.0327**	341	0.0979	Paired t-test
Clinical maximal capacity (ml)		314	348	0.2608	506	0.1234	Paired t-test
Anticholinergics use (n=17)*		17	11	**0.0182**	6	1.0000	$?^2$-test
Anticholinergics dose reduction			2		3		
Satisfaction (very) good/minimal/not			9/4/4		Missing data		
n=		19	17		8		
			Mean	Range	Mean	Range	
Follow up interval (months)			2.2	1-7	9.2	5-17	

*: Two patients used no anticholinergics because of adverse effects; they were not included.

One patient underwent detrusor myectomy after 5 months. Two myelomeningocele patients had a third treatment with Botox® after 2 and 18 months (intervals between first and second treatment 5 and 17 months). For the first patient this was successful for about two months only.

Conclusions

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 subsequent treatments is comparable, a much larger proportion of patients is referred to other treatments within a relatively short period.

The improvement of the patients' condition, the reduction in anticholinergics use, and the patients' satisfaction all are much smaller than for traumatic spinal cord patients [4]. Also, for the congenital spinal defects patient population a subsequent treatment seems effective only exceptionally.

This study has only a small number of patients, but on the basis of the data presented a study on a larger patient cohort would not be advised now.

The fact that the bladder compliance in this study group is much smaller than in patients with traumatic spinal cord injury might suggest a reason for the low response [4]. 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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