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TREATMENT WITH MODIFIED INTRAVESICAL OXYBUTYNIN CHLORIDE FOR NEUROGENIC BLADDER IN CHILDREN

Hypothesis / aims of study

It has been suggested that antimuscarinic pharmacotherapy is the gold standard therapy for patients with overactive bladder and low compliance bladder. Unfortunately, some patients do not respond to oral medications or have unacceptable side effects. We have reported that intravesical oxybutynin chloride with hydroxypropylcellulose (HPC) (modified intravesical oxybutynin) is an effective therapy for patients with detrusor overactivity. Our previous data suggest that modified intravesical oxybutynin has a possibility to reduce absorption of oxybutynin from bladder mucosa and to retain oxybutynin in the bladder longer and that modified intravesical oxybutynin may reduce systematic side effects compared to those of intravesical oxybutynin without HPC (1,2). From our previous reports, modified intravesical oxybutynin therapy has a possibility to reduce these unacceptable side effects for children with neurogenic bladder dysfunction. However, there has been no experience of modified intravesical oxybutynin therapy in children. In this study, we report efficacy, safety and side effects in neurogenic bladder in children treated with modified intravesical oxybutynin.

Study design, materials and methods

Modified intravesical oxybutynin chloride was administered to four children (3 males, 1 female) under 4 years old with neurogenic. The population included 3 children (Patient 2, 3, 4) with myelomeningocele and 1 (Patient 1) with a neurogenic bladder due to a resection of pelvic teratoma. All patients had to undergo general urological examinations as well as urodynamic studies to verify the diagnosis of neurogenic bladder. Vesicoureteral reflux (VUR) grade IV, in left ureter, was observed in Patient 4. The oxybutynin solution was instilled twice daily, via the catheter used for bladder emptying, at a dosage of 2.5 mg/5mL. A cystometrogram (CMG) was performed before, 1 week after, and 1 year after the first instillation of oxybutynin chloride. We also carefully observed side effects of the patients during this treatment.

Results

Before this treatment, all patients presented low compliance bladder and uninhibited contractions (UIC). One week after the initial treatment, both bladder capacity and compliance had improved in all patients (Table 1). Furthermore, UIC was undetected in three of four patients after 1 week. The improvement continued even one year after the induction of this therapy in two patients.

No anticholinergic systemic side effects were observed in all patients. However, patient 4 discontinued this therapy 2 months after the induction of this therapy because of upper UTI (Table 2).

Table 1 Bladder Capacity and Compliance of the Patients before and after Modified Intravesical Oxybutinin Chloride

Patient	Bladder capacity (mL)			Compliance (cmH_2O /mL)			UIC	
	Before	1 wk	1 year	Before	1 wk	1 year	1wk	1 year
1	49.7	114.7	200.6	1.7	3.8	6.7	(-)	(-)
2	16.0	77.8	105.0	0.2	2.6	3.5	(-)	(-)
3	6.0	48.0	50.0	0.1	1.7	10.0	(-)	(+)
4	131.0	180.0	NP	2.5	3.9	NP	(+)	NP

NP; not performed

Table 2 Urinary Tract Infections in the Patients

	Before 1 year	After 1 year
1	Lower UTI (3 times)	none
2	ABU	ABU
3	ABU	none
4	Upper UTI (1 time)	Upper UTI (3 times)*

UTI, urinary tract infection; ABU, Asymptomatic bacteriuria;
*, during two months after treatment of modified intravesical oxybutynin chloride

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Cystometrogram of the Patient 2 Before and After Modified Intravesical Oxybutinin Chloride (Infusion rate was 20 ml/min)

Interpretation of results

In this study, we investigated the efficacy and side effects of modified intravesical oxybutynin treatment in children with detrusor overactivity and/or low compliance bladder. Although the number of patients in this study was small, the increase of bladder capacity and improvement of bladder compliance as well as degree of incontinence were observed in all patients. Although we did not observe anti-cholinergic side effect, intravesical oxybutynin with HPC may increase the risk of upper UTI for the patient with VUR. The use of modified intravesical oxybutynin in children with neurogenic bladder with detrusor hyperactivity and/or high intravesical pressures during the filling phase, seems an important tool to improve continence and bladder compliance.

Concluding message

Our data suggested that modified intravesical oxybutynin is one of the treatment options for neurogenic bladder children.

References

1: Neurourol Urodyn (2000)19;683-8.
2: Int J Urol (2004)11;592-6.

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HUMAN SUBJECTS: This study was approved by the The study protocol was approved by the Ethical Committee for Clinical Trials of the Tottori University #368. and followed the Declaration of Helsinki Informed consent was obtained from the patients.