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USEFULNESS OF SYMPTOMS OR THE ESTIMATED BLADDER CAPACITY ON A VOIDING DIARY IN SELECTING ENURESIS MEDICATIONS

Hypothesis / aims of study
It has been reported that non-responders to desmopressin have a small bladder capacity. Additional treatment with anticholinergics for such non-responders for monosymptomatic enuresis (ME) is known to be beneficial. However, study results on combination therapies of desmopressin and anticholinergics for ME are scarce. We aimed to evaluate and compare the outcomes of desmopressin monotherapy with those of the simultaneous administration of desmopressin and anticholinergics in ME patients with a small bladder capacity and in patients with non-monosymptomatic enuresis (NME).

Study design, materials and methods
The medical records of 101 treatment-naïve children who visited our clinic between January 2004 and December 2010 and followed up for more than 2 months were reviewed and analyzed retrospectively. Small bladder capacity was defined by a maximal voided volume on voiding diary of less than 65% of the age-matched estimated bladder capacity. All ME patients (group A) received desmopressin tablets (0.1 mg or 0.2 mg). Patients with ME and a small bladder capacity (group B) were treated with desmopressin only or a combination of desmopressin and anticholinergics. NME (group C) patients received anticholinergics only or a combination of desmopressin and anticholinergics. We stratified the responses to these medications as complete (above 90% reduction of enuretic night), partial (50%~90% reduction), or no response (reduction below 50%) and analyzed the differences between the therapeutic effects in each group.

Results
General characteristics and results of the patients are listed in the Table 1. There were no significant differences in age, gender and estimated bladder capacity among the three study groups. Patients in groups B and C had significantly lower median and first morning voided volumes compared to group A. Voided volumes measured by uroflowmetry was significantly lower in group C than in the other groups. In group B, the response rate (partial or complete response) was not found to be different between monotherapy and combination therapy (80.0% vs. 81.9%, p=0.616, chi-square test) and this rate was similar for patients who received monotherapy in group A (74.1%) and those who received a combination therapy in group C (80.5%).

Interpretation of results
In monosymptomatic patients with a small bladder capacity, the response to desmopressin monotherapy and to a simultaneous combination therapy of desmopressin and anticholinergics is similar. We speculate that anticholinergics could be reserved for desmopressin non-responders, even when the functional bladder capacity estimated from the voiding diary is small.

Concluding message
Daytime voiding symptoms are more useful and informative rather than the small bladder capacity defined by the maximum voided volume on the voiding diary when selecting monotherapy or combination therapy for pediatric patients with enuresis.

Table 1 General characteristics and treatment results for the enuresis patients

	A group (ME)	B group (ME and small bladder)	C group (NME)	P
Number of patients	27	22	53	
Age (mean ± SD)	8.1 ± 2.1	7.8 ± 3.0	7.0 ± 2.4	0.104
Sex				0.524
Male	22 (81.5)	15 (71.4)	37 (69.8)	
Female	5 (18.5)	6 (28.6)	16 (30.2)	
Enuresis frequency (n/month)	22.1 ± 8.9	25.2 ± 7.6	21.5 ± 10.5	0.331
Bowel dysfunction (%)				0.437
None	25 (92.6)	19 (95.0)	44 (83.0)	
Constipation	2 (7.4)	0 (0)	6 (11.3)	
Encopresis	0 (0)	1 (5.0)	3 (5.7)	
Estimated bladder capacity (mean ± SD)	275.5 ± 65.0	265.7 ± 90.6	241.1 ± 67.0	0.104
Voiding diary (ml, mean ± SD)				
Voided volume_median	128.7 ± 50.0	92.1 ± 36.4	86.7 ± 37.3	<0.001
Voided volume_minimum	60.1 ± 46.5	55.9 ± 33.3	43.6 ± 29.6	0.113
Voided volume_maximum (FBC)	258.8 ± 90.6	155.0 ± 54.5	163.9 ± 67.1	<0.001
Daytime frequency	6.6 ± 2.2	6.4 ± 1.4	8.7 ± 4.7	0.016
First morning voided volume	169.8 ± 89.1	112.1 ± 40.0	117.1 ± 58.4	0.002
Reduced FBC (%)				<0.001
Yes	0 (0)	21 (100)	19 (40.4)	
No	27 (100)	0 (0)	28 (59.6)	
Uroflowmetry (mean ± SD)				
Qmax (ml/min)	17.5 ± 6.7	16.9 ± 6.3	14.9 ± 6.3	0.197
Voided volume (ml)	183.6 ± 97.7	159.3 ± 128.0	95.4 ± 52.5	<0.001
Post void residual (ml)	23.1 ± 19.1	24.6 ± 12.2	23.5 ± 23.8	0.968

Treatment result							
Medication	DDAVP	DDAVP	DDAVP+ antichol	DDAVP	DDAVP + antichol	Antichol	
Number of patients	27	10	11	1	41	11	
Treatment duration (mo)	6.0±4.2	6.2±3.3	8.3±7.1	2	7.0±4.1	5.0±4.2	
Non-response (%)	7 (25.9)	2 (20.0)	2 (18.2)	1 (100)	8 (19.5)	6 (54.5)	
Partial response (%)	11 (40.7)	1 (10.0)	5 (45.5)	0	16 (39.0)	0	
Full response (%)	9 (33.3)	7 (70.0)	4 (36.4)	0	17 (41.5)	5 (45.5)	
Overall success rate (%)	20 (74.1)	8 (80.0)	9 (81.9)	0	33 (80.5)	5 (45.5)	
Relapse rate (%)	30.0	0	14.3	-	26.4	40.0	

ME, monosymptomatic enuresis; NME, non-monosymptomatic enuresis; FBC, functional bladder capacity; Antichol, anticholinergics.

Disclosures
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