371

Chang S[1], Yang S S[1]
1. *Division of Urology, Buddhist Tzu Chi General Hospital, Taipei Branch*

URINARY BLADDER OVERDISTENSION MAY IMPAIR THE VOIDING FUNCTION OF KINDERGARTEN CHILDREN

Hypothesis / aims of study
To report the effects of urinary bladder overdistension on the voiding function of kindergarten children.

Study design, materials and methods
An uroflowmeter was set up in the toilets of 7 kindergartens. Children went to the toilet when he or she had desire or urge to void. Two uroflowmetry curves were requested, and additional tests were requested if the voided volume (VV) was <50% of the expected bladder capacity (EBC). Post void residual urine (PVR) was assessed by suprapubic ultrasound. A PVR >20 ml is regarded as elevated or incomplete emptying. Bladder capacity (BC) is defined as "VV+PVR", and shown as percentage of EBC. Uroflowmetry curves are classified as bell, plateau, staccato, or interrupted pattern. For statistical analysis uroflowmetry curves were categorized as bell-shaped or nonbell-shaped.

Results
Mean age of the 188 children was 4.5 ± 1.0 years. A total of 355 sets of uroflowmetry and PVR were eligible for evaluation. Nonbell-shaped uroflowmetry curves and elevated PVR were noted in 75 (21.1%) and 78 (22.0%) of 355 micturitions, respectively. Based on the ROC curve for the nonbell-shaped uroflowmetry curves, BC≧115% EBC is defined as urinary bladder overdistension.

Interpretation of results
There were statistically more elevated PVR, and more nonbell-shaped uroflowmetry curves in the voidings with bladder overdistension than those without overdistension (39.2% vs. 12.6%, and 40.8% vs. 10.4%, respectively, both $p < 0.01$). Of the same individual with both nonbell-shaped and bell-shaped curves, the nonbell-shaped curves usually occurred at higher BC/EBC than those of bell-shaped curves (133±46% vs. 84±38% EBC, $p<0.01$). There is a trend that peak uroflow rate increased when BC increased, but it decreased when BC was >200% EBC or >300ml.

Concluding message
Overdistension of the urinary bladder in kindergarten children resulted in more nonbell-shaped uroflowmetry curves, elevated post void residual urine. At extreme overdistension, peak flow rate decreased too.

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Is this a clinical trial?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**Ethics Committee at our hospital Buddhist Tzuchi General Hospital, Taipei Branch**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**