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CLINICAL AND VIDEOURODYNAMIC CHARACTERISTICS OF ADULT WOMEN WITH DYSFUNCTIONAL VOIDING

Hypothesis / aims of study
Dysfunctional voiding (DV) is an abnormality of bladder emptying in neurologically normal individuals where the external sphincter activity increases during voiding. Although DV is common in children and can be detected early in those with characteristic clinical presentations or recurrent urinary tract infection (UTI), the differential diagnosis between DV and detrusor overactivity (DO) in adult women is difficult and can be inaccurate when based on LUTS alone. This study investigated the clinical presentations and videourodynamic
characteristics of adult women with dysfunctional voiding

Study design, materials and methods
Design: a retrospective analysis of the videourodynamic (VUD) study results in recent 14 years.
Material and methods:
This study is a retrospective analysis and a total of 1605 consecutive women with lower urinary tract symptoms (LUTS) were analyzed from 1997 to 2010. The medical record charts were reviewed, and the clinical LUTS, co-morbidity, VUD characteristics, urodynamic parameters, and result of treatment were recorded in detail. Patients with pelvic organ prolapse, genuine stress urinary incontinence, previous genitourinary surgery, history of genitourinary tract cancer, neurogenic voiding dysfunction, established diagnosis of interstitial cystitis/painful bladder syndrome, or active UTI were excluded. These female patients with LUTS received VUD study for diagnosis. The clinical symptoms of LUTS were recorded in detail. The main symptom was defined as the most bothersome symptom that drove patients to seek help. DV was diagnosed when high voiding detrusor pressure, intermittent or increased external sphincter EMG activity, and a 'spinning top' urethral appearance on cinefluoroscopy during voiding occurred together. If patients were found to have a neurological disease, they were classified as having external-detrusor sphincter dyssynergia but not DV [1, 2]. The clinical urinary symptoms and VUD characteristics were compared with normal controls. Antimuscarinic or alpha-blocker treatment, with or without a skeletal muscle relaxant according to the chief complaint of storage or voiding symptoms, respectively, was given to women with DV. Patients were treated for 1 to 3 months and the treatment results were recorded using the validated 6-scale Patients Perception of Bladder Condition questionnaire.

Results
There were 168 women diagnosed with DV. DO occurred in 69% of women with DV. Patients with DV had lower cystometric bladder capacity, higher detrusor pressure, lower maximum flow rate, and larger post-void residual volume than the controls. (Table 1) Among patients with DV, urinary frequency (n = 69, 41.1%) was the most common chief complaint, followed by dysuria (n = 54, 32.1%), and urgency incontinence (n = 26, 15.5%). A total of 114 (67.9%) patients had storage symptoms and 54 (32.1%) had voiding symptoms as their chief complaints among those with DV. The incidence of urgency incontinence and dysuria were significantly greater than that in the control group, however, the incidence of frequency, urgency, or nocturia showed no significant difference between DV and control groups (Table 2). Treatment results were similar for antimuscarinic (41.2%) and alpha-blocker therapies (52.9%).

Interpretation of results
The results of this study revealed that DV is highly prevalent in women with LUTS. The incidence of DO (69%) and increased bladder sensation (17.9%) was also higher in DV group compared with the control group. In conjunction with smaller CBC and the presentation of storage symptoms in all women, we postulated that DV might be a voiding dysfunction originating from sensory urgency or DO. The urodynamic parameters in DV indicate that the vesicourethral abnormalities of DV are not only BOO, but also exhibit sensory disorders. Although dysuria was also a chief complaint in 32.1% of patients with DV, all these patients had storage LUTS as associated symptoms. These findings suggest that sensory dysfunction, either primary or secondary to urethral sphincter dysfunction, plays an important role in the pathophysiology of LUTS and the development of DV. Interestingly, all DV patients had storage symptoms and about half of the patients with primary storage symptoms were successfully treated with antimuscarinics. These results suggest that DO could be a primary etiology of DV in adult women. A longer treatment course might improve the success rate.

Concluding message
DO and storage LUTS commonly occurred in women with DV. Diagnosis of DV cannot be based on LUTS alone, as VUD studies yielded a high diagnostic rate for DV in women with LUTS.

Table 1. Urodynamic parameters of DV and control patients

	DV (n=168)	**Normal (n=272)**	***P* value**
CBC (ml)	286 ± 160	482 ± 100	< 0.001
Pdet (cmH_2O)	49.1 ± 17.4	18.8 ± 8.98	< 0.001
Qmax (ml/s)	11.3 ± 7.56	20.5 ± 7.95	< 0.001
PVR (ml)	77.4 ± 113	25.7 ± 44.0	< 0.001
Compliance (ml/cmH_2O)	63.0 ± 82.1	120 ± 121	< 0.001

DO	116 (69%)	0	< 0.001
IBS	22 (13.1%)	0	< 0.001

CBC: cystometric bladder capacity, Pdet: detrusor pressure, Qmax: maximum flow rate, PVR: post-void residual, DO: detrusor overactivity, IBS: increased bladder sensation

Table 2. Chief complaints of the DV and control patients

	DV (n=168)	**Normal (n=272)**	***p* value**
Frequency	69 (41.1%)	100 (36.8%)	0.42
Nocturia	3 (1.8%)	5 (1.8%)	0.16
Urgency	16 (9.5%)	15 (5.5%)	0.13
Urge incontinence	26 (15.5%)	13 (4.8%)	0.00
Dysuria	53 (32.1%)	54 (19.9%)	0.004
Urine retention	1 (0.6%)	3 (1.1%)	1.00
Residual sensation	0	3 (1.1%)	0.29
Terminal dribbling	0	1 (0.4%)	0.00
Bladder pain	0	49 (18.0%)	0.00
Micturition pain	0	4 (1.5%)	0.30

References

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Specify source of funding or grant	**none**
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	**Hualien Tzu Chi General Hospital I.R.B., Taiwan, R.O.C.**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**