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# URODYNAMIC EVALUATION OF TAMSULOSIN EFFECT ON NEUROGENIC DETRUSOR OVERACTIVITY.

## Aims of Study

Frequency, urgency and urge incontinence are not infrequent in patients with neurological disorders. In these patients overactive bladder symptoms are often sustained by detrusor overactivity of neurologic and/or myogenic origin. (Mallory 1991, Elbadawi 1993). Evidence from the peer review literature suggests that modification of the adrenoceptor (AR) expression induced by neurological or urological disorders could be responsible for the observed involuntary detrusor contractions. Experimental data in the animal model confirmed that pharmacologic modulation of bladder afferences (C and Aδ fibres) may reduce and sometimes abolish the observed detrusor overactivity. α1-ARs have been identified in the smooth muscle of urethra, prostate and bladder as well as in the nervous system. The possible role of α1-ARs located at the supraspinal, spinal, ganglionic, prejunctional and postjunctional level in the pathophysiology of storage symptoms and overactive detrusor has been considered.
Objective of this study was to investigate the effect of tamsulosin, an α1a and α1d adrenoceptor antagonist, on overactive detrusor of neurogenic origin.

## Methods

Sixteen male patients of 40 to 75 years (median 57 years) affected with neurogenic detrusor were enrolled in the study after informed consent was signed. The neurological diagnoses were as follows: multiple sclerosis (4 patients), multi-infarctual encephalopathy (3 pts.), familial spastic paraparesis (2 pts.), postinfective mielitis (2 pts.), spondilogenic mielopathy (1 pt.), multisystemic atrophy (3 pts.) and Parkinson syndrome (1 pt.). The diagnostic workup included: International Prostate Symptom Score, urinalysis, urine culture, renal, bladder and prostate ultrasonography, flowmetry (in duplicate) and pressure-flow study with concentric needle electromyography of the pelvic floor (in duplicate, 45 minute apart). None of these patients were taking medications active on the parasympathetic system.
Filling cystometry was carried out using room-temperature saline and infusion rate was 30 mls/min. The following urodynamic parameters were considered: volume at which the first micturition stimulus occurred, cystometric capacity, maximum flow rate, detrusor pressure at maximum flow, volume at which involuntary detrusor contractions (IDCs) occurred and their amplitude.
All parameters were obtained at baseline and after 4 weeks of treatment with tamsulosin 8 mg/day.

## Results

Tamsulosin treatment produced a significant subjective and objective improvement of bladder overactivity.

| | Pre | Post | p≤ |
|---|---|---|---|
| IPSS | 17.1 | 9.5 | 0,018 |
| Presence of IDCs | 16/16 | 8/16 | |
| Volume at 1st IDC (mls) | 172 | 282 | 0,01 |
| Cystometric capacity (mls) | 314 | 434 | 0,004 |
| PF-Qmax (ml/s) | 10.4 | 13.0 | 0,3 |
| PdetQmax (cmH2O) | 49.4 | 42.5 | 0,27 |

None of 16 patients reported significant tamsulosin-related side-effects.

## Conclusions

The involvement of α1-ARs in the pathophysiology of LUTS and particularly of storage symptoms is supported by the favourable effect of α1-ARs antagonists in patients with benign prostatic hyperplasia and no bladder outflow obstruction. Experimental data showed that α1-ARs stimulation results in a small and variable contractile effect on the bladder where the α1d-ARs subtype is predominant. The role of spinal α1-adrenoceptors in detrusor overactivity is supported by the superior effect of intratechal versus intra-arterial α1-AR antagonists administration on detrusor overactivity in the spontaneous hypertensive rats. Analysis of α1a, α1b and α1d-ARs distribution in the rat spinal cord demonstrated that the latter ones are predominant although the clinical implications of such findings are unknown. Although various experimental data provide the rationale for a possible therapeutic effect of α1-adrenoceptor antagonists on detrusor overactivity, the

peer-review literature is scarce about their possible role in patients with overactive bladder of neurogenic or non-neurogenic origin. The positive effect of tamsulosin treatment on overactive bladder symptoms in neurogenic patients is of interest but more important is the evidence of cure of overactive detrusor observed in 8 of 16 patients. We do not know why IDCs were completely abolished in some patients and only reduced in others. Difference in the pathophysiology of overactive detrusor in patients with various neurological conditions and differential response to α1-ARs blockade may be responsible for the observed variability in treatment outcome. The results of this study provide the rationale for the use of α1-ARs antagonists in neurogenic patients with overactive bladder but they also open a new perspective in studying the pathophysiology of detrusor overactivity in both neurogenic and non-neurogenic patients. Further insight in the relative role of α1-ARs in the urogenital and neural tissue and of α1a-ARs versus α1d-ARs is of importance for further development of the α1-ARs antagonists drugs family.

**References**


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