

Fig 2. Scheme of pelvic bone shapes in controls (1) and total uterine prolapses (2).

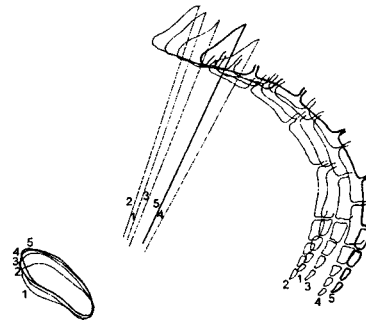


Fig 3. Schemes of pelvic bone shapes in patients' groups: controls (1) less than 30 (2), 41-50 (3), over 61 years old (4) and total uterine prolapses (5).

Biomechanical study of relations between the pelvic bone changes and the resistance of the suspensory and sustentory pelvic systems clearly demonstrates their negative effect to the pelvic statics. The enlargement of the pelvic outlet in total uterine prolapses decreases the resistance of their pelvic diaphragm three times more in comparison to the control cases. The augmentation of the distance "X" in the group of patients aged over 61 years, exposes the ventral part of their pelvis to a three times greater force than that calculated in the group of patients, aged less than 30 years.

Conclusion. Biomechanical approach in the study of the pelvic bone morphotopography in genital prolapses puts a new light allowing better understanding of their complex pathogenesis and directing their surgical treatment.

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RESPONSES TO CARBACHOL BUT NOT NEUROKININ A ARE ENHANCED IN DETRUSOR MUSCLE FROM CHILDREN WITH RECURRENT URINARY TRACT INFECTION

Aims of study

Neurokinin A (NKA) and substance P are neuropeptides found in primary afferent sensory fibres in bladder, although their role in the micturition reflex is unresolved. NKA is a potent contractile agent in isolated detrusor muscle taken from control adults, and from children with vesicoureteric reflux (VUR)¹. One aim of this study was to investigate the distribution of NKA- and SP-immunoreactive nerves in child bladder using immunohistochemical techniques.

Animal studies have shown that acute cystitis is associated with unstable detrusor contractions², but the responsiveness to agonists in humans with a history of recurrent bacterial cystitis has not been tested. In this study we have examined the contractility of human detrusor taken from children with a proven bacterial cystitis and vesicoureteric reflux (VUR), compared to children with previously sterile urine and VUR, who mainly came to attention via sibling tracing or antenatal detection. The agonists were carbachol and NKA.

Methods

Patients: Specimens were obtained from the bladder dome at the edge of the cystotomy incision of 57 patients (4 months to 12 years of age, 33 females) undergoing bilateral ureteric reimplantation to correct VUR. The microbiological details were recorded prospectively by the urologist, so as to characterize patients with recurrent proven bacterial cystitis.

Immunohistochemical studies: Stretched specimen were fixed, washed, and stored in cryoprotectant. Slide-mounted sections (15 µm) were incubated in primary antibody (polyclonal mouse anti-NKA 1:4000 and rabbit anti-SP 1:8000) at room temperature overnight, washed and incubated in secondary antibody for 2 h. Sections were incubated in 0.025% 3,3'-diaminobenzidine with 0.2% nickel ammonium sulfate and 0.03% H₂O₂ for 20 min and washed. Slides were counterstained with haematoxylin and eosin.

Functional studies: Strips of detrusor muscle (6 x 2 mm), were suspended in organ baths containing Krebs-Henseleit solution, continuously bubbled with 95% O₂ and 5% CO₂. After 60 min equilibration, the isolated detrusor strips were exposed to 100 µM carbachol (maximum contraction). Concentration-response curves to NKA and carbachol were constructed by discrete addition of drug to the preparation. Responses were measured in g tension and were also expressed as percent of maximum response.

Results

Immunohistochemical studies: In the bladder mucosa, moderate numbers of small fibres immunoreactive for NKA and SP were localised near the urothelium and around blood vessels. In the lamina propria, small fibres were associated with small arteries and arterioles. In the detrusor muscle, NKA- and SP-immunoreactive fibres were rather sparse, and ran parallel to the muscle bundles.

Functional studies: Exogenously applied carbachol (1 nM – 100 µM) and NKA (1 nM – 10 µM) caused concentration-dependent contractions in detrusor muscle strips. A maximum contraction of 2.5 ± 0.3 g (n=36) was evoked by 100 µM carbachol, whereas NKA evoked a maximum contraction of 2.1 ± 0.3 g (59 ± 4 % of the maximum response; n=31) at 10 µM, with corresponding pD₂ values 5.84 ± 0.07 and 7.09 ± 0.09 , respectively. No differences in smooth muscle contractility with respect to age or sex were observed.

In the UTI-group, the maximum response to carbachol was 2.9 ± 0.3 g (n=26), whereas the maximum response in non-UTI-patients only reached 1.6 ± 0.3 g (n=10; p<0.05; Fig 1A). Corresponding pD₂ values were 5.89 ± 0.08 and 5.70 ± 0.13 , respectively. No differences in responses to NKA were observed between the two groups, and the responses were 2.1 ± 0.3 g (58 ± 5%; n=25), and 2.6 ± 1.4 g (76 ± 15 %; n=6; Fig 1B), respectively.

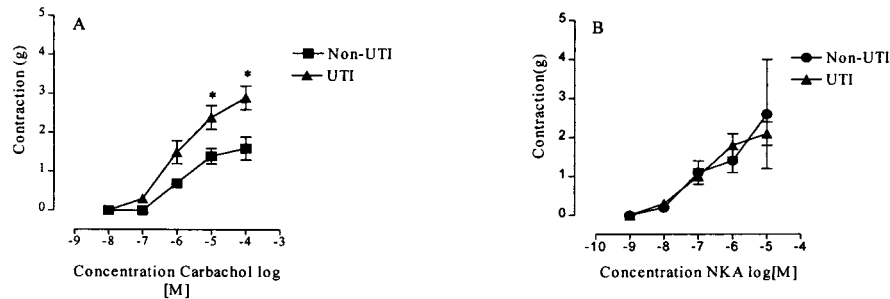


Figure 1. Graph showing responses to (A) carbachol and (B) NKA in child detrusor in children with and without a previous history of urinary tract infection (UTI). The difference in contractility in response to carbachol is statistically significant (p<0.05).

Conclusions

No differences in responses to NKA were observed between detrusor strips from with children with or without a history of UTI. However, carbachol produced a significantly larger contractile response in children with a history of UTI compared with uninfected children, indicating possible alterations in muscarinic receptor characteristics. The relatively sparse distribution of NKA-like immunoreactive nerve fibres in the detrusor was surprising in view of its potent contractile effect upon this muscle in vitro: thus its physiological role in micturition remains incompletely understood. The presence of NKA and SP immunoreactive fibres around blood vessels suggests a possible function of these neuropeptides in control of local blood flow.

References

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SHORT-TERM EFFICACY AND SAFETY OF TEMIVERINE IN THE TREATMENT OF BLADDER OVERACTIVITY—A RANDOMIZED CLINICAL TRIAL IN ADULT MEN AND WOMEN

Aims of Study: Temiverine, a new agent with anticholinergic and calcium channel antagonistic properties, has been found, in uncontrolled and active-drug controlled studies, clinically useful for the treatment of symptomatic unstable