

THE DEFINITION OF DETRUSOR AFTER-CONTRACTION: WHO CARES?

Hypothesis / aims of study

Detrusor after-contraction (DAC) is a urodynamic finding of unknown clinical significance.

The most common definition of DAC is *any increase in detrusor pressure after cessation of urinary flow* but in a recent review it became apparent there are several areas of disagreement among workers:

1. The amplitude of contraction required to qualify as DAC.
2. Whether amplitude is expressed in cm H₂O, or relative to the maximum voiding detrusor contraction pressure, p_{detmax} .
3. Whether detrusor pressure must return to baseline between voiding and the DAC.

We imagine the lack of a clear definition of DAC is one reason why the prevalence and significance of DAC remain unclear. In this study we assessed the effect of changing the definition of DAC on its apparent prevalence, when the urodynamic data remain unchanged.

Study design, materials and methods

We reviewed ambulatory urodynamic traces from 108 ladies. For each void we recorded:

- the amplitude of the voiding detrusor contraction;
- the amplitude of any detrusor after-contraction, with 0 indicating no after-contraction.
- the lowest detrusor pressure between voiding and any after-contraction;

Detrusor pressure increases associated with coughs, climbing stairs, running water, discomfort or pain were excluded.

Results

We measured the prevalence of DAC as we changed the definition of DAC:

First, we varied the pressure threshold in absolute units (cmH₂O) required to score a DAC (figure 1, left).

We repeated the entire analysis, expressing the threshold as a percentage of the maximum voiding pressure p_{detmax} (figure 1, right)

Each analysis was conducted for the following cases:

- For the first void of the ambulatory study ie. as if from single-void urodynamics.
- For any void of the study ie. as reported from ambulatory urodynamics.
- For the first void, but also requiring a return to baseline between the void and DAC.

These six analyses capture the main definitions of DAC from the recent literature.

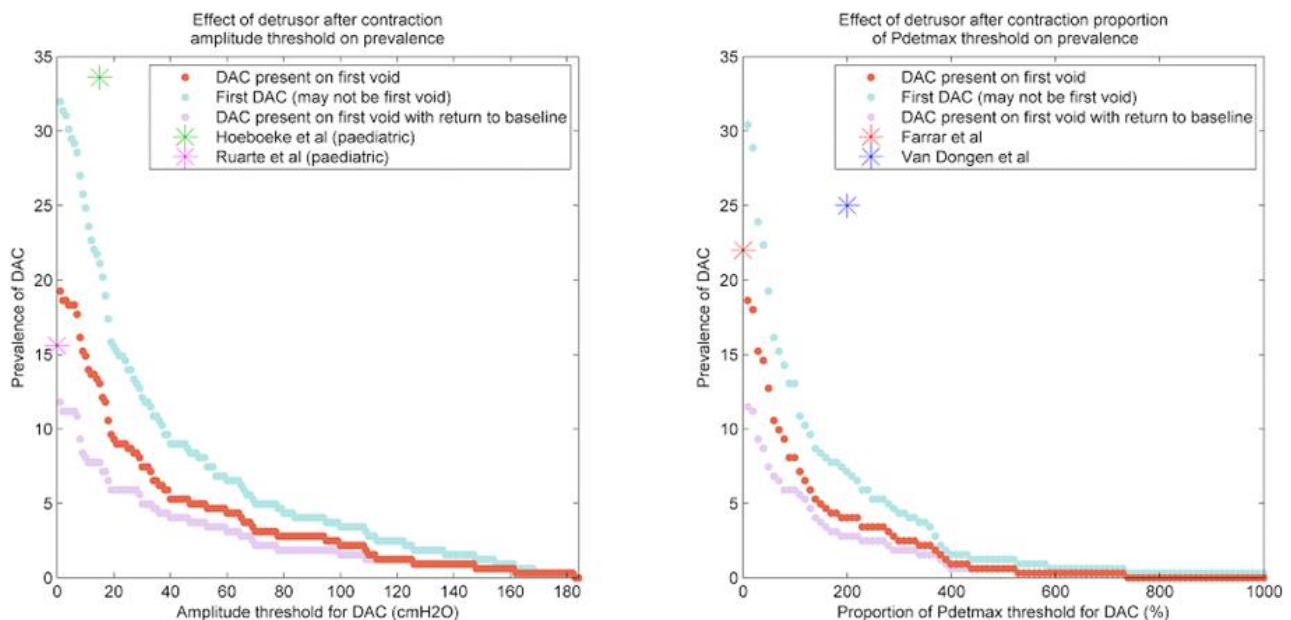


Figure 1: Graphs of reported prevalence, versus the detrusor contraction required to score a DAC. At (left) the threshold is expressed in cm H₂O, and (right) as a % of p_{detmax} .

Interpretation of results

The nature of the problem is evident in Table 1. The apparent prevalence of DAC in 108 women varies dramatically with the definition of DAC, from 5% to 32% depending which published definition we adopt.

Definition of DAC	Notes	Prevalence in 108 women
200% increase in detrusor pressure	Definition adopted in [1]	5%
Any detrusor rise after return to baseline		12%
Detrusor pressure rise > 15 cm H ₂ O	Definition adopted in [2]	15%
Any detrusor pressure rise, single void	Common definition eg. [3]	20%
Any detrusor pressure rise, any void	De facto on ambulatory studies	32%

Table 1: Prevalence of DAC in 108 women with LUTS, per 5 alternative definitions of DAC.

Defining a DAC as any detrusor pressure rise, one group [3] report a prevalence of 22%. This result is compatible with our own data in 108 women.

Other workers [1] report 25% prevalence for DAC, this time requiring a 200% increase in detrusor pressure. But for this definition of DAC we would report only 5% prevalence.

Concluding message

The apparent prevalence of DAC depends greatly on its definition; in the worst cases, comparisons between studies using different definitions are meaningless.

The International Continence Society has been proactive in standardising definitions for lower urinary tract disorders; We urge the ICS to work towards a formal definition of detrusor after-contraction, allowing further research to improve understanding of this potentially important physiological phenomenon.

References

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2. Hoebeke, P. B., Van Gool, J. D., Van Laecke, E., Vande Walle, J., Plancke, H. (1996) The after-contraction in paediatric urodynamics. Br J Urol 78, 780-782.
3. Farrar DJ, Webster GM: The relevance of the detrusor after contraction in the female: a preliminary study. Proceedings of the 25th Annual Meeting of the International Continence Society. Sydney, Australia: October 17–20, 1995.

Disclosures

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