

QUALITY CONTROL DURING URODYNAMIC STUDIES WITH TYPICAL VALUE RANGES AND TYPICAL SIGNAL PATTERNS FOR INITIAL COUGH IN PATIENTS WITH NEUROGENIC BLADDERS

Hypothesis / aims of study

To establish typical value ranges (TVRs) and to analyze typical signal patterns (TSPs) of initial cough (cough before bladder filling) for quality control in urodynamic studies.

Study design, materials and methods

A total of 539 urodynamic traces from patients with neurogenic bladder over one year were retrospectively reviewed. The TVRs for cough amplitude in intravesical pressure (Pves), abdominal pressure (Pabd), and detrusor pressure (Pdet) during the initial cough were established. We used 95% range as a reference range for all the parameters. Cough spikes in Pdet were described and classified. Related reasons of different cough spikes were given. Remedial actions for inappropriate cough spikes were also presented. The quality of all the cystometry traces was checked.

Results

Table 1. Mean value, standard deviation, median, 95% CI and 95% range of Initial cough pressures and initial resting pressures in supine and sitting positions

	N	Mean ± SD	Median	95% CI	95% range
Supine position					
Cough Pves (cmH ₂ O)	443	34.8 ± 16.9	31.1	33.3-36.4	12-83
Cough Pabd (cmH ₂ O)	443	36.5 ± 19.2	31.3	34.8-38.3	14-88
Cough amplitude in Pves(cmH ₂ O)	443	21.1 ± 15.6	16.3	19.7-22.6	4-62
Cough amplitude in Pabd(cmH ₂ O)	443	22.9 ± 17.6	17.2	21.3-24.6	3-70
Cough Pdet Max (cmH ₂ O)	364	7.8 ± 6.5	6.1	7.1-8.5	0-25
Cough Pdet Min (cmH ₂ O)	298	-9.1 ± 10.0	-6.1	-10.2- -7.9	-38-1
Sitting position					
Cough Pves (cmH ₂ O)	96	56.1 ± 21.5	53.9	51.7-60.4	20-108
Cough Pabd (cmH ₂ O)	96	57.2 ± 23.0	53.6	52.5-61.8	17-108
Cough amplitude in Pves(cmH ₂ O)	96	41.1 ± 21.9	36.1	36.6-45.5	9-95
Cough amplitude in Pabd(cmH ₂ O)	96	42.5 ± 23.1	37.3	37.9-47.2	8-98
Cough Pdet Max (cmH ₂ O)	89	11.6 ± 8.6	9.8	9.8-13.4	1-41
Cough Pdet Min (cmH ₂ O)	74	-11.2 ± 9.9	-8.3	-13.5- -8.9	-44-3

Fig. Different cough spikes. (a) Type I cough signal: Pdet has a minimal change (< 5 cmH₂O). (b) Type II a cough signal: Pdet has a positive spike (> 5 cmH₂O). (c) Type II b cough signal: Pdet has a negative cough spike (> 5 cmH₂O). (d) Type IIIa cough signal: Pdet has a positive to negative biphasic cough spike. (e) Type IIIb cough signal: Pdet has a negative to positive cough spike.

Table 2. Distribution of good quality tracings in different initial cough spike groups

Initial Cough Type	Pdet change	Frequency	Frequency of good quality tracings	Percentage of good quality tracings(%)
I	Pdet has a minimal change (< 5 cmH ₂ O)	165	146	88.5*
II	monophasic cough spike	230	162	70.4
III	biphasic spike	144	110	76.4

Interpretation of results

Cough amplitude in Pves and Pabd were similar and 95% lay in the following ranges: 4-62, 3-70 cmH₂O in supine position and 9-95, 8-98 cmH₂O in sitting position. Cough Pdet has a range of -38-25 cmH₂O in supine position and -44-41 cmH₂O in sitting positions. The cough spikes in Pdet were classified as follows: Type I, Pdet pressure has minimal change (<5 cmH₂O) during cough; Type II, monophasic spike (>5 cmH₂O) in Pdet; and Type III, biphasic spikes in Pdet. The tracings with Type I cough got more good quality traces (P < 0.01).

Concluding message

TVRs for initial cough test have been established for quantitative quality control among neurogenic bladder patients. TSPs for initial cough signal have been described and good cough signal has been recommended for quality control in urodynamics.

Disclosures

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