

#534. Detrusor pressure during Neurogenic Detrusor Overactivity: How much is too much?

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BACKGROUND AND AIM OF THE STUDY

Upper urinary tract (UUT) deterioration and urosepsis are one of the top three causes of death for patients with spinal cord injuries (SCI)¹.

Urodynamics (UDM) is critical for correctly identifying and diagnosing hazardous pressure changes and for the management of neurogenic LUTS². So far, there is no consensus on which UDS parameters can predict UUT deterioration³. In this setting, the role and impact of neurogenic Detrusor Overactivity Leak Point Pressure⁴ is controversial for the lack of data.

DETRUSOR OVERACTIVITY LEAK POINT PRESSURE (DOLPP)

Investigation, defined by ICS as:

Lowest detrusor pressure rise with detrusor overactivity at which urine leakage first occurs in the absence of a voluntary detrusor contraction or increased abdominal pressure.

Primary aim was to determine which UDS parameters are correlated to vesico-ureteral reflux (VUR); secondary aim was to define a reliable cut-off for N-DOLPP.

METHODS

This study was designed as a retrospective comparative single-center study based on data from UDS of adult SCI patients.

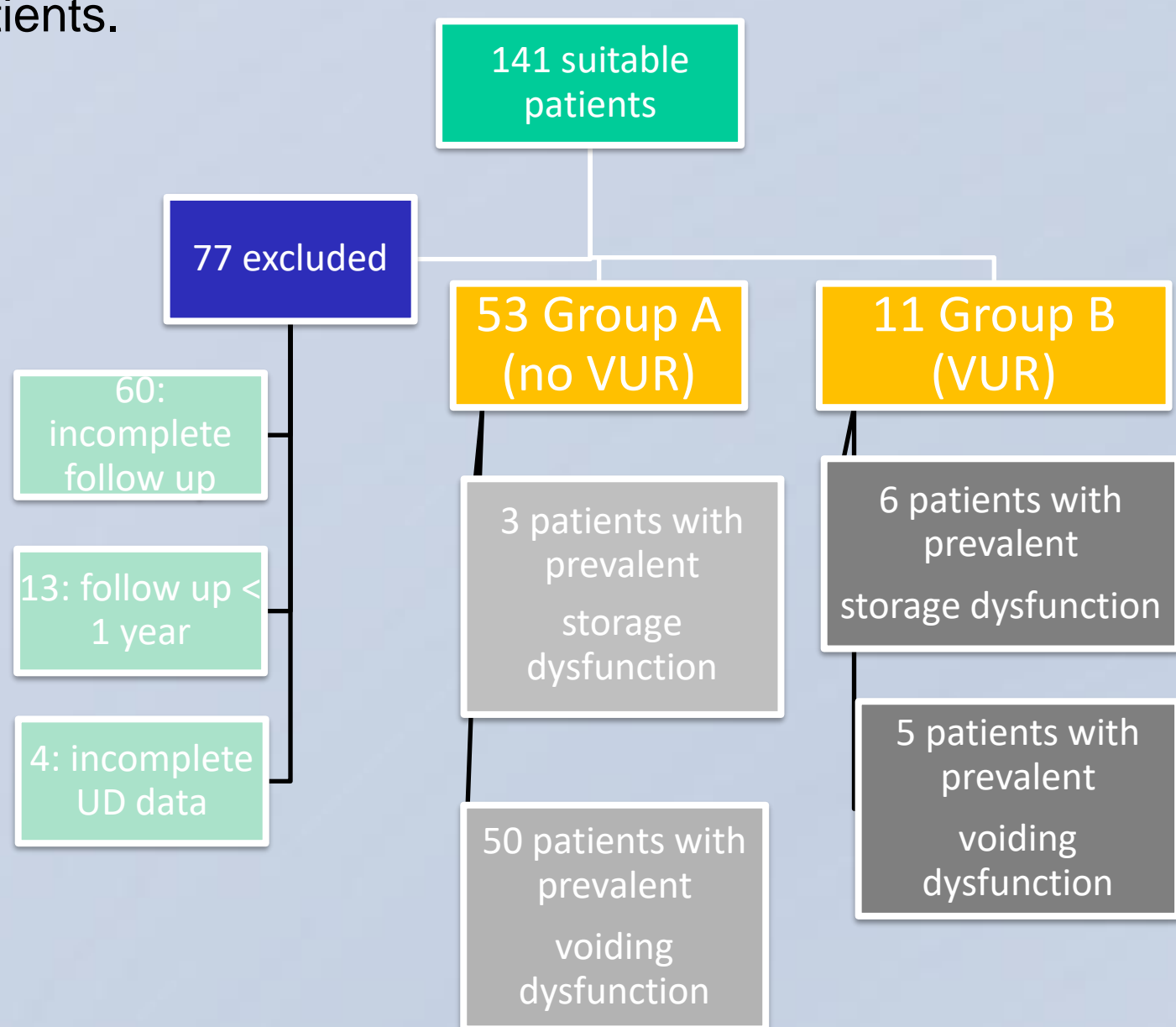


Table 1 shows the characteristics of the two cohorts, which were substantially homogeneous.

	Group A (no VUR)	Gruppo B (VUR)
Tot	53	11
M, n (%)	43 (81.1%)	9 (81.8%)
F, n (%)	10 (18.9%)	2 (18.2%)
Age (years), range (mean)	20 - 75 (38)	19 - 52 (28)
SCI site, n (%)		
Cervical	15 (28.3%)	2 (18.2%)
High Thoracic (≤D6)	17 (32.1%)	2 (18.2%)
Low Thoracic (>D6)	20 (37.7%)	7 (63.6%)
Lumbar	1 (1.9%)	0
Time from injury, days, range (mean)	102 - 22064 (3781)	25 - 947 (436)
Micturition		
Reflex voiding, n (%)	5 (9.4%)	2 (18.2%)
CIC, n (%)	20 (37.7%)	6 (54.5%)
Permanent CV, n (%)	28 (52.8%)	3 (27.3%)
Urge urinary incontinence		
YES, n (%)	24 (45.3%)	8 (72.7%)
NO, n (%)	29 (54.7%)	3 (27.3%)
Pharmacological Treatment		
No	10 (19%)	6 (54.5%)
Yes (Antimuscarinic or Botox or Combined Therapy)	43 (81%)	5 (45.5%)

Chi square test was used for categorical data, and Student's T test for unpaired data. Pvalue were considered significant for <0.05. The relation between UDS variables and VUR was also analyzed.

ROC curves were built to individuate the optimal N-DOLPP.

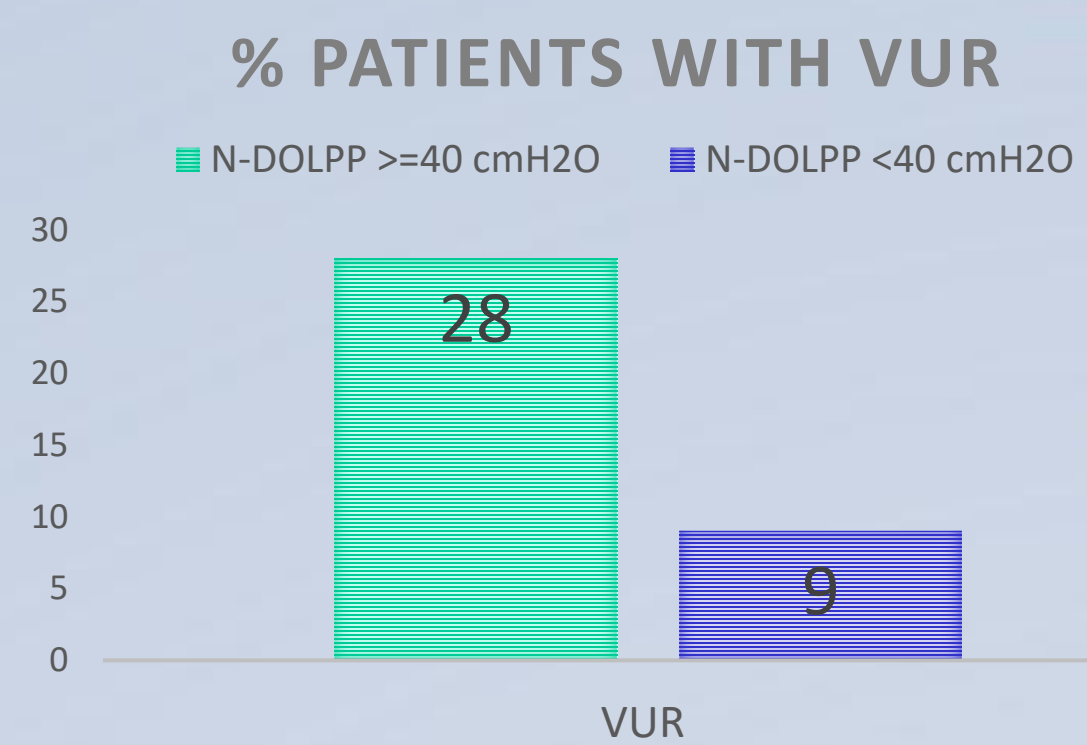
RESULTS

We found significant differences in the UDS parameters between the two groups:

UDS Parameters	Group A (no VUR)	Group B (VUR)	p-value
Maximum cystometric capacity (CCmax) ml, mean (SD) range	447.5 (117.6) 150 - 700	243.5 (140.7) 30 - 500	<0,0001
Presence of NDO n, %	48 (90.5%)	11 (100%)	> 0.05
Bladder filling at first detrusor contraction ml (BF-DC), mean (SD) range	279.8 (122.5) 50 - 550	146.8 (95.1) 30 - 330	0,001
Maximum detrusor pressure cmH2O (DPmax), mean (SD) range	39.6 (25.3) 12 - 111	77.2 (45.8) 28 - 160	0,0003
N-DOLPP cmH2O, mean (SD) range	41.2 (24.9) 28 - 90	61 (31) 28 - 95	0,025

From the ROC curve analysis, a N-DOLPP cut-off 40 cmH2O correctly classified as VUR or no VUR 62.5% of patients (Sensibility: 72.7%; Specificity: 60.4%).

Considering the groups N-DOLPP ≥ 40 cmH2O or <40 cmH2O, the odds-ratio for VUR was 4.06 (CI95% 0.97-17.10, p=0.056).



CONCLUSIONS

According to our data, VUR was associated to lower bladder capacity, precocious DO (lower bladder filling at first DC), higher mean N-DOLPP and higher Pdetmax during detrusor overactivity at filling cystometry.

Our analysis also suggests 40 cmH2O as an optimal cut-off for N-DOLPP, and identify NDO-LPP > 40 cmH2O as risk-factor for developing VUR in neurological SCI patients.

This suggests that the ideal treatment should aim to improve bladder capacity and compliance and keep the detrusor pressure during contractions <40 cmH2O, identified as a safety N-DOLPP cut-off.

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