

Neurogenic bladder syndrome in SCI patients measured by UDS according to the duration from injury

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Objective

- The description of the findings in UDS according to the duration from injury in patients suffered from traumatic SCI.

Methods

Retrospective study, using medical records

Inclusion criteria

- Age over 18
- Suprasacral traumatic spinal cord injury
- Completed urodynamic study after spinal cord injury

Exclusion criteria

- Other neurologic disease that can affect voiding function.
- Previous urological abnormality (e.g. BPH, urological cancer, CKD, etc.)

Urodynamic parameters

- Bladder sensation during filling cystometry
- Detrusor function during filling cystometry
- Maximum detrusor pressure during filling cystometry
- Compliance during filling cystometry
- Cystometric bladder capacity
- Pressure of detrusor at maximal flow
- Urethral function during voiding
- Post void residual urine
- Urinary maximal flow.

Participant group

- Participants were classified in 4 groups in complete SCI patients and 5 groups in incomplete SCI patients according to the duration from injury.

Complete SCI : 0-3m / 3-6m / 6-12m / over 12m

Incomplete SCI : 0-1.5m / 1.5-3m / 3-6m / 6-12m / over 12m

Statistics

-One way ANOVA for quantitative variables; Chi-square test for qualitative variables to investigate the difference between the group.

Results 1

Basal characteristics

Patients characteristics (n=340)

Age	59.75±14.28 (19-93)
Sex	F: 80 (23.5%), M: 260 (76.5%)
Date from injury to test	
0-3m	104 (30.6%)
3-6m	35 (10.3%)
6-12m	52 (15.3%)
After 12m	149 (43.8%)
AIS	
A	85 (25.0%)
B	17 (5.0%)
C	84 (24.7%)
D	154 (45.3%)
NLI	
Cervical	249 (73.2%)
Thoracic	75 (22.1%)
Lumbar	16 (4.7%)
LEMS (Right)	10.33±9.11
LEMS (Left)	10.45±9.04
LEMS (Total)	20.75±17.94
SCIM (self care)	9.13±6.70
SCIM (resp, bladder)	22.75±11.47
SCIM (motor)	13.39±45.76
SCIM (total)	45.765±28.27

Quantitative variables

	0-3m	3-6m	6-12m	After 12m	P-value
MCC (cc)	545.9±123.1	502.9±164.6	474.9±132.9*	445.9±167.3***	0.001
Qmax (cc/s)	4.0±6.9	4.8±7.0	6.5±9.4	8.3±33.6	0.518
VV (cc)	107.3±188.9	87.6±134.8	127.1±168.8	125.1±193.9	0.654
PVRU (cc)	436.8±251.0	411.6±258.1	344.8±234.1	319.6±226.6***	0.001
Pdet at Qmax (cmH₂O)	31.7±76.8	29.9±20.2	33.6±18.0	30.3±16.0	0.978

Results 2

Qualitative variables

Complete (n=85)

	0-3m	3-6m	6-12m	After 12m	P-value
Bladder sense					0.427
Absence	12(85.7%)	9(90.0%)	12(80.0%)	34(73.95%)	
Reduced	1(7.1%)	1(10.0%)	2(13.3%)	1(2.2%)	
Normal	0(0.0%)	0(0.0%)	0(0.0%)	6(13.0%)	
Increased	1(7.1%)	0(0.0%)	1(6.7%)	5(10.9%)	
Low compliance					0.059
Yes	1(7.1%)	0(0.0%)	4(26.7%)	15(32.6%)	
No	13(92.9%)	10(100.0%)	11(73.3%)	31(67.4%)	
Detrusor function_F					0.005
Overactive	0(0.0%)	1(10.0%)	5(33.3%)	19(42.2%)	
Normal	14(100.0%)	9(90.0%)	10(66.7%)	26(57.8%)	
DSD					0.018
Yes	0(0.0%)	1(10.0%)	4(26.7%)	17(37.0%)	
No	14(100.0%)	9(90.0%)	11(73.3%)	29(63.0%)	
Detrusor function_V					0.131
Acontractile	12(85.7%)	9(90.0%)	9(60.0%)	24(52.2%)	
Hypoactive	2(14.3%)	0(0.0%)	3(20.0%)	12(26.1%)	
Normal	0(0.0%)	1(10.0%)	3(20.0%)	10(21.7%)	

Incomplete (n=255)

	0-1.5 m	1.5-3m	3-6m	6-12m	After 12m	P-value
Bladder sense						0.050
Absence	15 (30.0%)	10 (25.0%)	3 (12.0%)	10 (27.0%)	19 (18.4%)	
Reduced	12 (24.0%)	11 (27.5%)	3 (12.0%)	2 (5.4%)	15(14.6%)	
Normal	16 (32.0%)	11 (27.5%)	12 (48.0%)	10 (27.0%)	39(37.9%)	
Increased	7 (14.0%)	8 (20.0%)	7 (28.0%)	15 (40.5%)	30(29.1%)	
Low compliance						0.001
Yes	45(90.0%)	35(87.5%)	16(64.0%)	21(56.8%)	74(71.8%)	
No	5(10.0%)	5(12.5%)	9(36.0%)	16(43.2%)	29(28.2%)	
Detrusor function_F						<0.001
Overactive	7(14.3%)	5(12.5%)	11(44.0%)	16(43.2%)	38(37.3%)	
Normal	42(85.7%)	35(87.5%)	14(56.0%)	21(56.8%)	64(62.7%)	
DSD						<0.001
Yes	18(36.7%)	15(37.5%)	18(72.0%)	23(62.2%)	67(65.0%)	
No	31(63.3%)	25(62.5%)	7(28.0%)	14(37.8%)	36(35.0%)	
Detrusor function_V						<0.001
Acontractile	33(66.0%)	24(60.0%)	11(44.0%)	9(24.3%)	27(26.2%)	
Hypoactive	5(10.0%)	6(12.8%)	2(8.0%)	6(16.2%)	28(27.2%)	
Normal	12(24.0%)	10(25.0%)	12(48.0%)	22(59.5%)	48(46.6%)	

Conclusions

- The UDS performed in traumatic suprasacral SCI shows differences according to the duration from injury, and the timing of changes in urodynamic parameters depended on the severity of injury.
- Initial or follow-up UDS of traumatic suprasacral SCI should be considered after 6 months from injury for complete SCI patients; 3 months from injury for incomplete SCI patients.