

Lower urinary tract dysfunction in patients with neuromyelitis optica spectrum disorders: Magnetic resonance imaging findings and urodynamic study findings make a difference in the management of bladder dysfunction



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Hypothesis / Aims of study:

- NMOSD is an inflammatory demyelinating disease involving the optic nerves, spinal cord, and cerebral white matter
 - The incidence of LUTS and LUTD in NMOSD is approximately 80% [1]
 - The severity of LUTS / LUTD is associated with widespread transverse myelitis and central spinal cord injury
- The purpose of this study is to investigate whether brain/spinal MRI findings and UDS findings make a difference in the management of bladder dysfunction in patients with NMOSD

Study design / Methods:

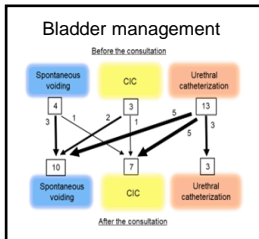
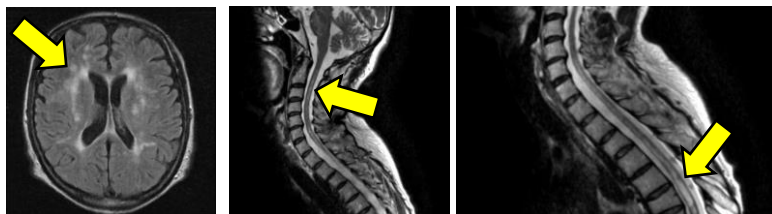
- Between October 2010 and March 2023, 35 patients (27 females and eight males) were diagnosed with NMOSD
- The patients were treated for NMOSD at each specialized neurological hospital and subsequently admitted to our hospital for rehabilitation.
- Urologists intervened for bladder management in 20 (57%) patients
- We retrospectively evaluated MRI and UDS findings and bladder management in 20 patients based on medical records

Results:

Table. Clinical data of 20 patients with NMOSD

Gender	
Male	4 (20%)
Female	16 (80%)
AQP4-IgG	
Positive	18 (90%)
Negative	2 (10%)
MRI (site of lesion)	
Extensive cerebral white matter + Cervical	5 (25%)
Cervical	1 (5%)
Cervical + Thoracic	11 (55%)
Thoracic	3 (15%)
Episode	
First	12 (60%)
Recurrence	8 (40%)
UDS findings (n = 18)	
LCB	3 (15%)
LCB + DO	6 (30%)
DO	1 (5%)
DO + DU	1 (5%)
DU	2 (10%)
Normal	5 (25%)

Representative MRI findings of cerebral and spinal cord lesions



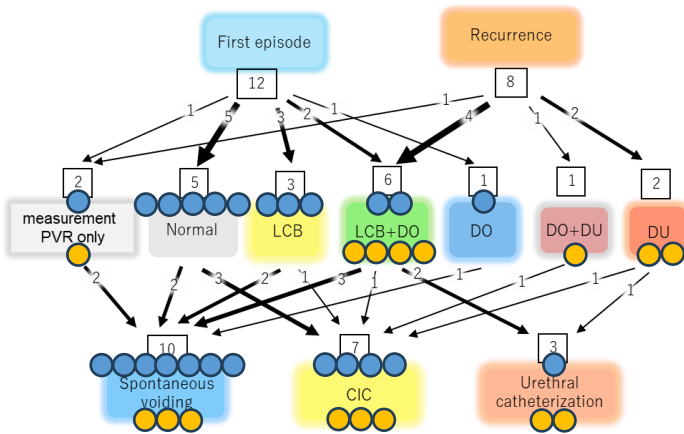
Episode

First: spontaneous voiding: 7/12(58.3%)
 Recurrence: spontaneous voiding: 3/8(37.5%), DU: 3/8(37.5%)

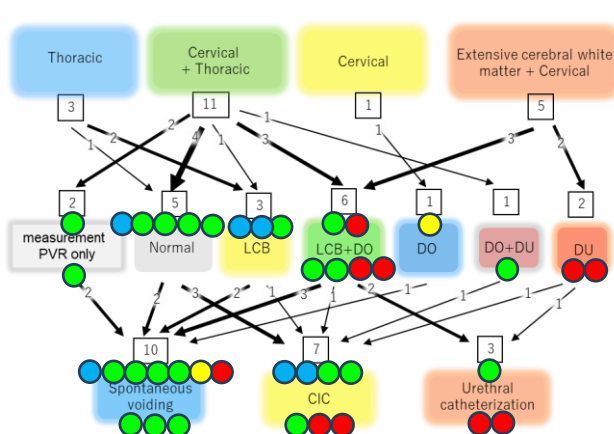
MRI findings

Without extensive cerebral lesion: spontaneous voiding: 9/15(60.0%)
 With extensive cerebral lesion:
 Spontaneous voiding: 1/5(20.0%): first episode
 Urethral catheterization or CIC: 4/5(80%): recurrence

Episode



MRI findings



Discussion:

Neurogenic bladder in NMOSD showed a mixed picture, with overactive and acontractile detrusors among the patients [1][2]
 The urinary symptoms tended to be more severe in patients with NMO than in those with MS [3]
 Cervical spinal cord lesions and the central lesion involving gray matter are responsible for the urinary symptoms [3]
 Rehabilitation should include educational training for intermittent self-catheterization and drug adjustments for NMOSD [4]
 These UDS data are from the convalescent period only at our rehabilitation hospital → Results may be biased
 There were some deficiencies in our data ; presence of DSD, no mention of EDSS or FIM, etc

Conclusions:

This study showed that LUTD is common in NMOSD patients
 MRI findings and UDS findings are variable in patients with NMOSD
 Severe and recurrent NMOSD patients require CIC or indwelling catheters for bladder management

References:

- [1] de Carvalho FL, et al. Neurourol Urodyn 35: 39-43, 2016 [2] Gupta A, et al. J Neurosci Rural Pract 11: 245-249, 2020
 [3] Yamamoto T, et al. Clin Exp Neuroimmunol 7: 52-58 2016 [4] Ikeda J, et al. Prog Rehabil Med 1, 20160007, 2016

Abbreviations: NMOSD: neuromyelitis optica spectrum disorder, LUTS/LUTD: lower urinary tract symptoms/dysfunctions, MRI: magnetic resonance imaging, UDS: urodynamic study, AQP4-IgG: aquaporin-4 immunoglobulin G, PVR: post-void residual urine, LCB: low compliance bladder, DO: detrusor overactivity, DU: detrusor underactivity, CIC: clean intermittent catheterization, EDSS: Expanded Disability Status Scale, FIM: Functional Independence Measure