Early sacral neuromodulation: a promising opportunity or an overload for patients with a recent spinal cord injury?

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INTRODUCTION & AIM

Spinal cord injury (SCI) above the sacral micturition centre results in neurogenic lower urinary tract dysfunction (nLUTD) in up to **95% of patients**, including neurogenic detrusor overactivity (NDO) and detrusor-sphincter dyssynergia (DSD) [1,3].

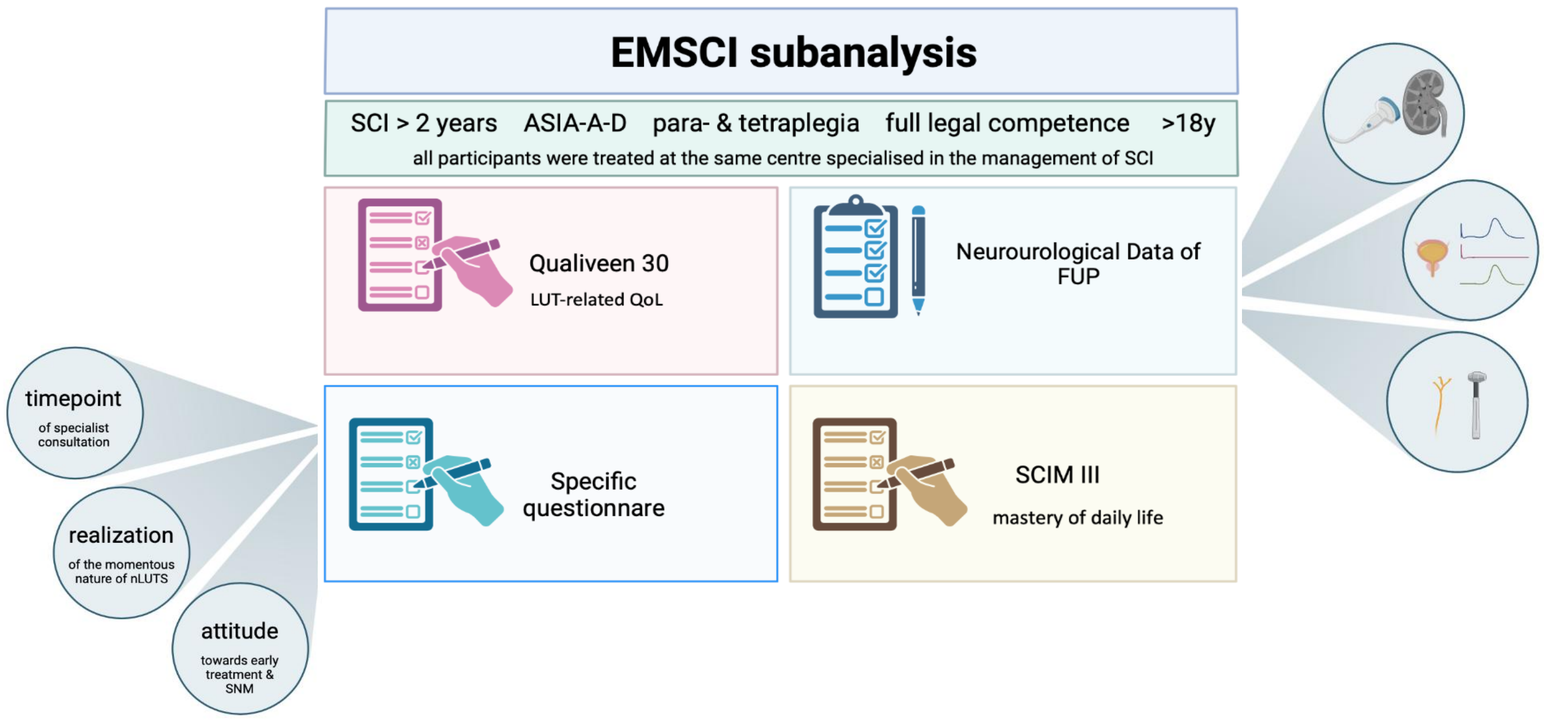
Current management is limited to **symptomatic treatment** (clean intermittent self-catheterization (CISC), anticholinergics, botulinum toxin). No clinically established approach exists to ***prevent*** the development of DSD.

Sacral neuromodulation (SNM) is an established therapy for non-neurogenic bladder dysfunction. Preclinical and clinical evidence suggests that **early SNM (eSNM)** applied in the acute/post-acute phase after SCI may preserve bladder function and prevent DSD [1,2].

However, the therapeutic window for eSNM coincides with the most vulnerable period for the patient, raising the question: ***Is eSNM a promising opportunity or an overload?***

The aim was to evaluate the **ethical and clinical feasibility** of a future randomised controlled trial on eSNM in complete SCI by assessing:

- Patient awareness of nLUTD at time of specialist consultation
- Retrospective willingness to consent to early treatment incl. SNM
- Impact of nLUTD on lower urinary tract-related quality of life (QoL)



RESULTS

KEY DEMOGRAPHICS

n = 86 | **86% male** | Median age: **47.5 y** (IQR ±15.69)
81.2% traumatic SCI | **96.5%** paraplegia | **40%** AIS-A

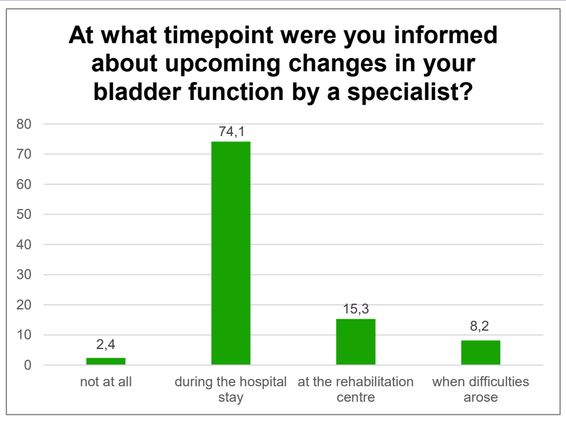
Neurourological profile:

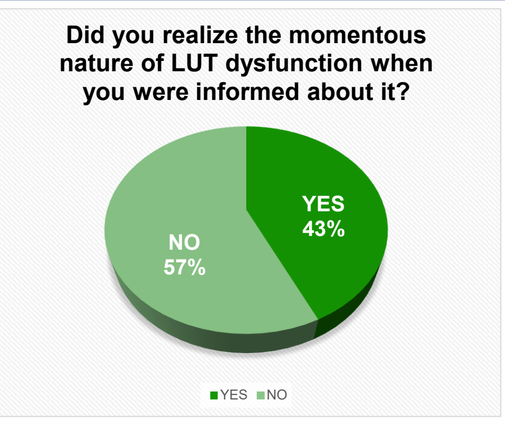
- NDO with DSD: 44.3%
- NDO alone: 17.1%
- Incontinence: 32.8%
- Recurrent UTI: 46.2%
- CISC: 72.5%
- Anticholinergic therapy: 35.3%
- Mean Qualiveen-30: 1.28
- SCIM III: 70.02
- DSD on videourodynamics: 60%

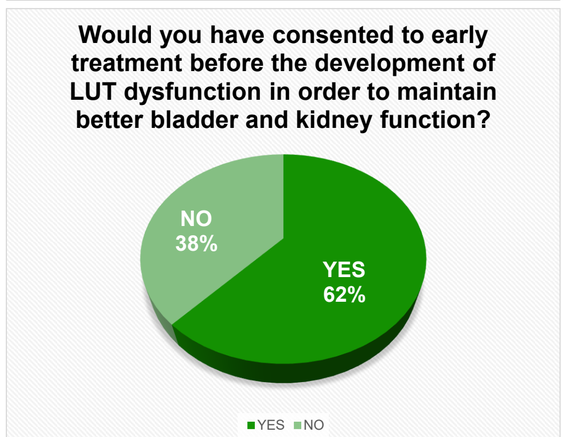
Videourodynamic results (mean ± SD):

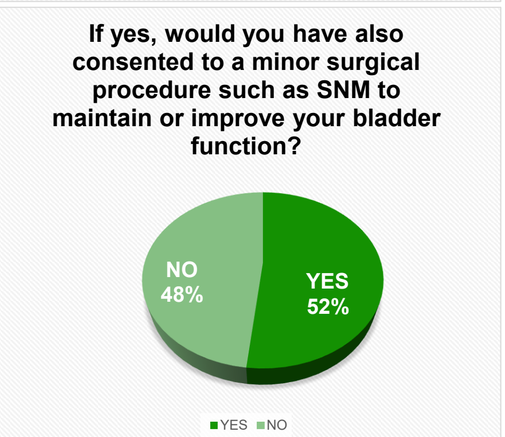
- Max. bladder capacity: 526.75 ± 170.35 ml
- Detrusor pressure: 28.22 ± 24.06 cmH_2O
- Bladder compliance, median: 42 cmH_2O/ml
- Post-void residual volume: 488.69 ± 236.03 ml

SPECIFIC QUESTIONNAIRE









eSNM: PRO vs. CONTRA

PRO

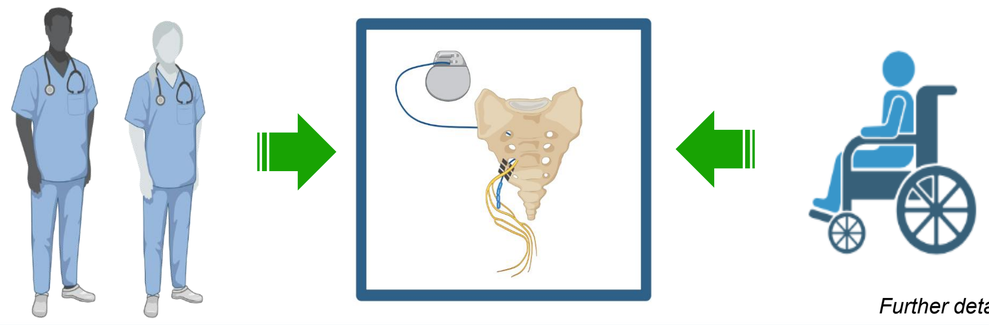
- **95% have severe nLUTS**
- **Possible prevention of DSD**
- **Patients would retrospectively consent**
- **nLUTS are key in SCI related QOL**
- **Minimal invasive therapy**
- **Fully reversible**
- **Can be turned off by the patient at any time**

CONTRA

- **Clinically unfavourable timeframe**
- **No awareness of nLUTS**
- **(Minimally) invasive procedure**
- **Unclear neurological and urological outcomes**

CONCLUSION

- Clinical and preclinical research indicates that eSNM could be a **game changer** in SCI-related nLUTD [1,2].
- A majority of chronic SCI patients would **retrospectively have consented** to early treatment, supporting the ethical feasibility of future RCTs.
- Lack of awareness of nLUTD at the time of specialist consultation is significantly associated with reduced QoL — emphasising the need for **structured patient education.**



Further details, see our publication!

References
[1] Sievert KD et al. Early sacral neuromodulation prevents urinary incontinence after complete spinal cord injury. Ann Neurol. 2010;67(1):74–84.
[2] Keller EE et al. Early sacral neuromodulation ameliorates urinary bladder function and structure in complete spinal cord injury minipigs. Neurourol Urodyn. 2020;39(4):1145–1154.
[3] EAU Guidelines on Neuro-Urology, 2023.
[4] Images created with Biorender.com.