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Hypothesis/Aim of Study

Diseases affecting the spinal cord (SCI) may have significant physical, psychological, social, and economic consequences. Patients with SCI (traumatic or non-traumatic) often present with neurogenic lower urinary tract dysfunction (N-LUTD), bowel dysfunction and sexual dysfunction which may have a significant impact in their quality of life (QoL). The aim of the present study was to compare the bladder management methods, prevalence of urinary and fecal incontinence, sexual activity, and quality of life of women with SCI of different etiologies.

Methods and Materials

- In this observational study, we evaluated a consecutive series of 98 adult women (> 18 years of age) with traumatic (T) or non-traumatic (NT) disease affecting the spinal cord. All subjects had SCI for more than one year. This study was approved by the Institutional Review Board of our hospital. Patients agreed to participate after full disclosure of its purposes and written consent was obtained from all participants.
- Patients were invited to participate when they presented for a routine medical visit with a physiatrist, neurologist, or urologist. The only exclusion criterion was the presence of cognitive impairment. Clinical and epidemiological data such as age, duration of neurologic disease and level of SCI were evaluated. We used a structured questionnaire the Neurogenic Bladder Symptom Score short form (NBSS-SF) and the Neurogenic Bowel Dysfunction Score (NBDS) to evaluate the method of bladder management and presence of urinary and fecal incontinence in each patient. Urinary incontinence was considered when the patient had urine leak a few times a week or more. Fecal incontinence was considered when the patient had fecal incontinence 3 or 4 times per month or more. Sexual activity was defined as any sexual activity (with or without a partner) in the past 6 months.
- To assess the impact of N-LUTD on QOL we used the QoL question of the NBSS-SF, which has a scale of 0 (“pleased”) to 4 (“unhappy”). General quality of life was evaluated with the World Health Organization Quality of Life – bref (WHOQoL-bref). We compared women with traumatic and non-traumatic SCI.


Table

	Traumatic SCI (n= 14)	Non-traumatic SCI (n= 84)	P value
Age	42.4 ± 9.2	43.0 ± 12.5	0.838
Duration of disease	13.7 ± 8.9	12.4 ± 7.9	0.628
Cervical-thoracic level	78.6%	54.5% (n= 22)	0.175
Wheelchair bound	45.4%	20.0% (n= 70)	0.118
Spontaneous voiding	7.1%	75.0%	<0.001
Urinary incontinence	85.7%	48.1%	0.009
Fecal incontinence	46.1%	18.7% (n= 75)	0.066
NBSS-SF*	15.9 ± 7.0	10.7 ± 6.5	0.014
NBDS ^a	13.8 ± 8.5	8.3 ± 6.9	0.031
NBSS Quality of life	2.6 ± 1.0	1.9 ± 1.3	0.045
WHOQoL-bref ^{**}	71.0 ± 13.0	68.1 ± 18.1	0.614
Sexually active	42.8%	52.4%	0.509

*NBSS-SF: Neurogenic Bladder Symptom Score short form.

^a NBDS: Neurogenic Bowel Dysfunction Score; ^{**} LUTD: Neurogenic lower urinary tract dysfunction.

^{**}WHOQoL-bref: World Health Organization Quality of Life - bref



Results

- The median age of the participants (n=98) was 42.5 (range 19 to 69) years. Spinal cord injury was traumatic in 14 (14.3%) patients and NT in 84 (85.7%). The main cause of NT SCI was multiple sclerosis 47 (56.0%). Other causes included transverse myelitis, Neuromyelitis Optica, myelomeningocele and other. The mean duration of neurological disease was 12.6 ± 8.0 years, and the level of SCI was cervical in 29.3%, thoracic in 29.3% and lumbosacral in 41.4%. Most patients had severe neurological deficits including 43.2% who were wheelchair bound.
- A total of 65 (66.3%) women were able to void spontaneously, 25 (25.5%) perform CIC for bladder emptying and 8 (8.2%) use an indwelling catheter. Urinary incontinence was reported by 51 (52.0%) women and fecal incontinence by 18 (18.4%). The mean NBSS-SF was 11.6 ± 6.8 and the mean NBDS was 9.0 ± 7.3. Compared to women with NT SCI, those with traumatic SCI had similar age and duration of neurological disease, more severe neurological deficits (higher percentage of wheelchair users), were less likely to void spontaneously, have higher prevalence of urinary and fecal incontinence, higher NBSS-SF and NBDS scores. The rate of sexually active participants and the quality-of-life scores were similar between the groups (Table). In a multivariate analysis (logistic regression), patient age (OR = 0.957, 95% CI 0.918-0.997, p= 0.039), urinary continence (OR = 4.104, 95% CI 1.572-10.715, p= 0.003) and spontaneous voiding (OR = 3.610, 95% CI 1.177-11.111, p= 0.011) were associated with sexual activity. The NBSS-SF demonstrated good diagnostic accuracy in detecting sexually active women with an area under the ROC curve of 76% [64-86%] 95% CI. p <0.001). A score 24 was the best threshold, with a sensitivity of 72.1% and specificity of 78.9%.

Interpretation of results

In this cross-sectional study we found a high prevalence of LUT dysfunction and bowel dysfunction including urinary incontinence and fecal incontinence among women with SCI of different etiologies. Patients with non-traumatic SCI in our cohort had similar age and disease duration, but lesser severity of neurologic deficits as noted by their lower rate of wheelchair use for locomotion. Consistent with their less severe neurological disability, women with non-traumatic SCI showed higher rates of spontaneous voiding, urinary continence, and fecal continence. Sexual activity rates and QoL scores were similar in comparison to women with T SCI. In a multivariate analysis, younger age, urinary continence, and spontaneous voiding were associated with higher rates of sexual activity. The NBSS-SF demonstrated good diagnostic accuracy in detecting sexually active women, reinforcing the association between sexual and LUT dysfunction. For future analysis, we plan to include more patients with traumatic SCI, improved evaluation of neurologic deficits and data on sexual modalities, satisfaction, and specific sexual domains, to better understand the differences between women with traumatic and NT SCI.

Concluding message

Women with traumatic SCI had worse neurological disability and more severe lower urinary tract dysfunction and bowel dysfunction in comparison to those with non-traumatic SCI. Urinary continence and spontaneous voiding were associated with higher rates of sexual activity and the NBSS-SF score showed a significant discriminatory power to identify sexually active women