

Is intermittent self-catherization in individuals with neurogenic lower urinary tract dysfunction the gold standard for everyone? A retrospective cohort study

Jens Wöllner¹, Jörg Krebs², Franziska Rademacher¹, Jürgen Pannek¹

¹Neuro-Urology, Swiss Paraplegic Center, Nottwil, Switzerland

²Clinical Trial Unit, Swiss Paraplegic Center, Nottwil, Switzerland

Introduction

According to international guidelines, bladder evacuation in individuals with neurogenic lower urinary tract dysfunction (NLUTD) should be changed to intermittent catheterization as soon as possible during primary rehabilitation after spinal cord injury / disease (SCI/D). The aim of this retrospective cohort study was to evaluate the implementation of this guidelines in clinical reality.

Methods

The electronic patient database of a single SCI/D rehabilitation center was screened for patients with NLUTD who underwent primary rehabilitation from January 2015 to December 2017. Data regarding patient characteristics, SCI/D and bladder management were collected and analyzed.

Results

The data of 255 males (74.3%) and 88 females (25.7%) with an average age of 54 ± 19 years were analyzed (Table 1). The average duration of rehabilitation was 5.8 ± 2.8 months. At the beginning of primary rehabilitation, most patients had a transurethral or suprapubic catheter (58.0%, 199/343) and only 14.3% (49/343) patients performed intermittent catheterization (Fig. 1). Bladder management changed during rehabilitation, and at discharge, most patients evacuated the bladder by reflex voiding (48.4%, 166/343) or intermittent catheterization (28.8%, 99/343). Only about 20% had a suprapubic catheter. Elderly patients (≥ 60 years) were more often discharged with a suprapubic or transurethral catheter compared to younger patients ($p < 0.002$) (Table 2 & 3). Insufficient hand function was the main reason for not performing intermittent catheterization.

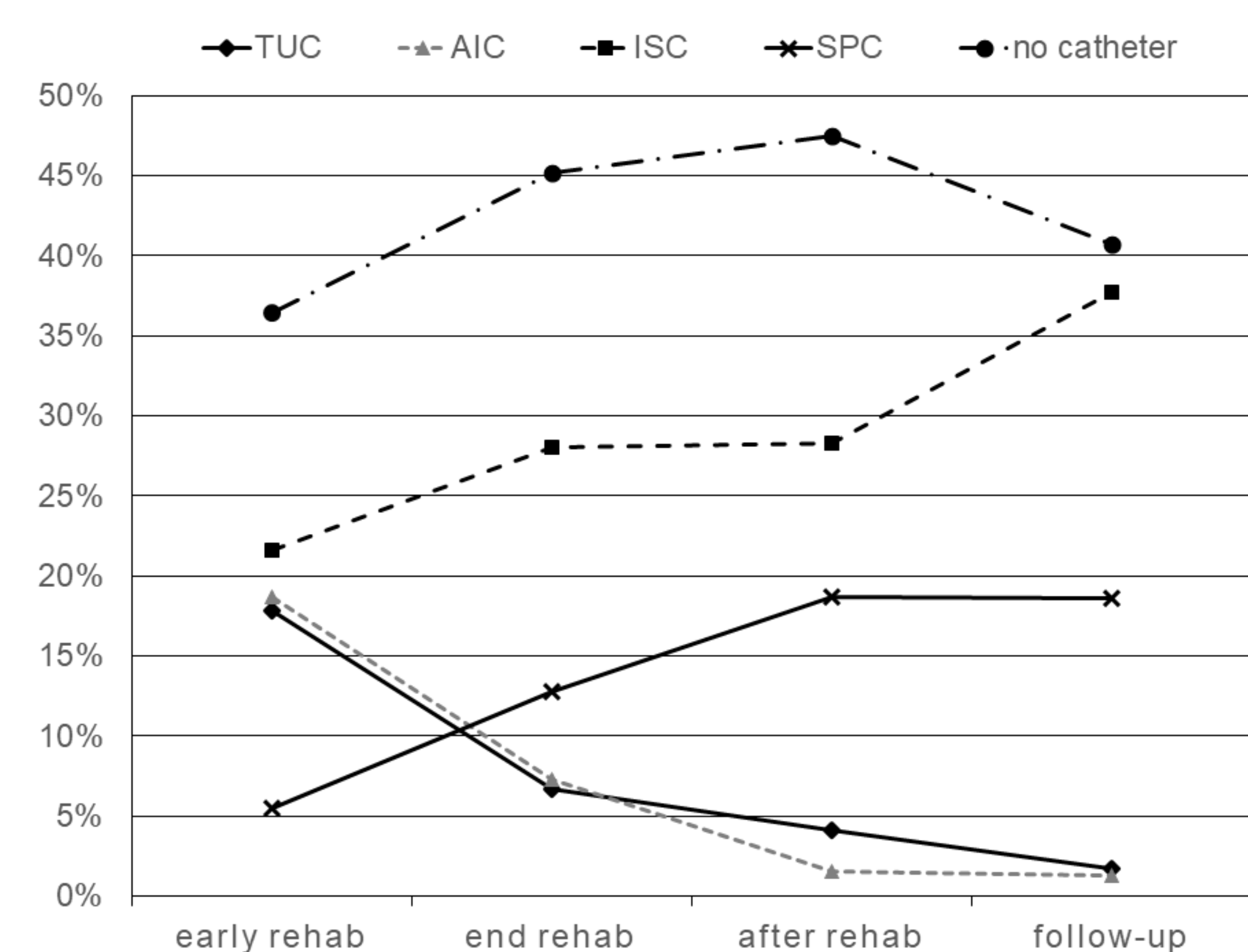


Figure 1

Frequencies of different bladder evacuation methods during and after primary rehabilitation. TUC: transurethral catheterization; AIC: assisted intermittent catheterization; ISC: intermittent self-catheterization; SPC: suprapubic catheterization; no catheter: bladder evacuation without the use of a catheter (i.e. reflex or quasi-normal voiding)

Table 1. The characteristics of the evaluated patients

variables	categories	n	%
sex	female	88	25.7
	male	255	74.3
etiology	traumatic SCI	170	49.6
	non-traumatic SCI	173	50.4
level of SCI	cervical	108	31.5
	thoracic	139	40.5
	lumbo-sacral	55	16.0
	not available	41	12.0
completeness of SCI	motor complete	146	42.6
	motor incomplete	152	44.3
	not available	45	13.1
SCI severity	C1-C4 AIS A-C	36	10.5
	C5-C8 AIS A-C	36	10.5
	T1-S5 AIS A-C	139	40.5
	AIS D	87	25.4
	not available	45	13.1

Table 2. Binary logistic regression predicting bladder evacuation by intermittent self-catheterization from sex, age, injury severity, initial voiding method and above-average bladder capacity

predictors	end of primary rehabilitation			after primary rehabilitation		
	p	Exp(B)	95% CI Exp(B)	p	Exp(B)	95% CI Exp(B)
sex ¹ (female / male)	0.03	2.67	1.10-6.53	0.17	2.97	0.63-14.0
age ¹ (≤ 65 / > 65 years)	0.007	23.1	2.36-226	0.014	12.2	1.65-90.5
injury severity			<0.0001	0.016		
C1-C4 AIS A-C	0.13	0.23	0.03-1.52	0.017	0.38	0.003-0.56
C5-C8 AIS A-C	0.27	2.11	0.56-7.94	0.09	0.19	0.03-1.27
T1-S5 AIS A-C	0.0003	7.60	2.52-22.9	0.97	0.97	0.18-5.08
AIS D			reference category			reference category
initial voiding method	0.048	1.37	1.00-1.88	0.11	1.54	0.91-2.60
above-average bladder capacity ¹ (no / yes)	0.038	2.32	1.05-5.13	0.033	7.03	1.17-42.4

Table 3. Distribution of bladder evacuation methods for sex, age and injury severity

		ISC	AIC	SPC	TUC	no catheter
		% (95% CI) / n	% (95% CI) / n	% (95% CI) / n	% (95% CI) / n	% (95% CI) / n
sex						
	female	23.9 (15.4-34.1) / 21	5.7 (1.9-12.8) / 5	15.9 (9.0-25.2) / 14	8.0 (3.3-15.7) / 7	46.6 (35.9-57.5) / 41
end rehab	male	29.4 (23.9-35.4) / 75	7.8 (4.9-11.9) / 20	11.8 (8.1-16.4) / 30	6.3 (3.6-10.0) / 16	44.7 (38.5-51.0) / 114
	female	21.6 (13.5-31.6) / 19	1.1 (0.03-6.2) / 1	21.6 (13.5-31.6) / 19	6.8 (2.5-14.3) / 6	48.9 (38.1-59.7) / 43
after rehab	male	30.6 (25.0-36.6) / 78	1.6 (0.4-4.0) / 4	17.6 (13.2-22.9) / 45	3.1 (1.4-6.1) / 8	47.1 (40.8-53.4) / 120
	female					
age						
	≤ 65 years	24.5 (19.9-29.6) / 79	7.5 (4.8-10.9) / 24	13.4 (9.8-17.6) / 43	6.8 (4.3-10.2) / 22	47.8 (42.3-53.4) / 154
end rehab	> 65 years	81.0 (58.1-94.6) / 17	4.8 (0.1-23.8) / 1	4.8 (0.1-23.8) / 1	4.8 (0.1-23.8) / 1	4.8 (0.1-23.8) / 1
	female					
after rehab	≤ 65 years	24.5 (19.9-29.6) / 79	1.6 (0.5-3.6) / 5	19.6 (15.4-24.3) / 63	6.8 (4.0-6.8) / 13	50.3 (44.7-55.9) / 162
	> 65 years	85.7 (63.7-97.0) / 17	0 / 0	4.8 (0.1-23.8) / 1	4.8 (0.1-23.8) / 1	4.8 (0.1-23.8) / 1

Conclusions

Only approximately 30% of all patients performed intermittent catheterization after primary rehabilitation. Bladder management is a holistic rehabilitation process, aiming at preserving both renal function and quality of life, and therefore, intermittent self-catheterization is not the best solution for all patients.