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LONG-TERM INDWELLING URINARY CATHETER PROBLEMS

Hypothesis / aims of study
The study is a cross-sectional analysis of data from 202 adult long-term (indefinite use) indwelling urinary catheter users in the USA. The aims were to:
1. Characterize the sample of 202 community-dwelling long-term adult indwelling urinary catheter users.
 2. Describe the prevalence and extent of self-reported catheter-related problems over a two month period.
3. Explore relationships among demographics, catheter management practices, and catheter problems.

Study design, materials and methods
The study was conducted in two sites: New York City and Rochester, NY, USA. This cross sectional analysis is based on an in-depth baseline interview in the homes of study subjects prior to randomization for a trial to teach urinary catheter self-management (a 4 month teaching intervention and 12 months of data collection). The interviews were conducted by trained interviewers and lasted between 1-1.5 hours. Data were obtained by self-reported recall for the previous two months. While family members and other caregivers were present, answers were obtained from the person with the catheter.
Two instruments were used: 1) *Demographics and Catheter Care Questionnaire (DMC)* and 2) *Catheter Problems Questionnaire (CPQ).* Both instruments were developed by the Principal Investigator for research in similar populations and modified for this study. Demographic and catheter management questions were asked to characterize the sample. Frequency of catheter related problems (such as sediment, leakage, pain) was asked, and for catheter associated urinary tract infection (CAUTI) and blockage of the catheter, associated treatments utilized were solicited. CAUTI was defined as a urinary infection treated with an antibiotic. Blockage was related to encrustation or debris inside the catheter.

Results
Sample: The sample included 51% males, Ages ranged from 19 to 96 with a median age of 61, and mean of 61.4 (SD 17.4) years. The race identified by the majority was white (57%), followed by Black (30%), Asian (2%), biracial (2%), American Indian or Alaskan Native (2%) and unknown (9%). Eleven percent of the sample was Hispanic. Spinal cord injury (SCI) and multiple sclerosis (MS) were the most common medical diagnoses, with 40% and 23% respectively. The sample was highly disabled, with 60% or more reporting difficulty with one or more of: bathing, dressing, toileting, and getting out of a bed or chair, and about 19% needed help with eating. Indwelling urethral catheters were used by 56% and suprapubic by 44%. The length of time of catheter use varied considerably from 1 to 470 months (39 yrs.). The mean was 72.5 months/6yrs (SD 85months/7yrs.); median use was 3.25 yrs.

Catheter problems: (See Table 1.) In just two months prior to study enrollment, 31% reported having had a CAUTI (74 events in 63 persons), 24 % had blockage of the catheter, 12% dislodgement, 43% leakage, and 23% catheter- related pain. Catheter size, type of catheter (urethral versus suprapubic) and gender were not related to CAUTI. Blockage was significantly related to CAUTI (Chi Sq 6.01, df=1, P= 0.014). Younger persons were more likely to have reported CAUTI (mean 57.5 years, SD 16.3), as compared with those who did not (mean 63 yrs., SD 17.6) (t test= 2.11, df 199, P=. 0.036).
The top five reported symptoms of CAUTI were changes in the urine or generalized symptoms: color of urine (76%), odor of urine (68%), malaise (59%), weakness (51%), and sediment (48%). Other usual urinary tract infection symptoms were reported less often: pain in the bladder area (46%) or back/side (37%), burning (44%), chills (41%), and fever (40%). Also reported were: spasms in the bladder (43%) or muscles (32%), blood (40%), mental changes (24%), leaking (24%), and autonomic dysreflexia(14%).

Table 1. Catheter problems in past two months

Catheter problems in past two months	Number persons	Percentage	Mean (SD) entire sample	Rate/1000 catheter days
UTI	63	31	0.37 (0.63)	6.22
Blockage	48	24 *	0.67 (1.71)	6.22
Dislodgement	25	12	0.21 (0.68)	11.08

Other catheter problems in past two months	Number persons	Percentage entire sample	Frequency of those with problem %			
			Daily %	Weekly to several times/ wk. %	Monthly to several times/ mo. %	Once in past 2 mos. %
Leaking (bypassing urine)	86	43	9	10	51	29
Sediment	127	63	24	29	39	7
Kinks/twists	40	20	13	8	40	40
Bladder spasms	72	36	37	24	30	10
Autonomic dysreflexia	26	13	4	31	38	27

*The outlier test based on zero-inflated Poisson models[1] identified three observations in the blockage variable. Outliers were replaced with the observations closest to them, 9, for the calculation of means.

Table 2. Treatments associated with catheter problems in two months

Treatments	UTI (n=63)			Blockage (n=47)*		
	Total # events	% affected	**Mean(SD)	Total # events	% affected	**Mean (SD)
Extra nurse home visit	14	19	0.22 (0.49)	26	30	0.55 (.99)
Extra office visit	18	25	0.29 (0.52)	13	23	0.28 (0.54)
ED visit	25	35	0.40 (0.61)	16	19	0.34 (0.84)
Hospitalized	20	27	0.32 (0.56)	N/A		
Rehabilitation or nursing home stay	2	3	0.03 0.175)			
Catheter changed	48	65	0.76 (0.64)	58	70	1.23 (1.22)
Urine cultured	54	76	0.86 (0.59)	N/A		
Antibiotic prescribed	75	100	1.19 (0.53)			

*One person of 48 did not know the frequency for blockage so is not included. ** Means (SDs) calculated only for those affected with the problem, i.e., 63 with UTI and 47 with blockage.

Interpretation of results
Catheter problems were frequent even for a two month period indicating a level of vulnerability to catheter complications and disruption of daily life due to these events. These problems are associated with considerable healthcare expenditures, including nurse home visits for catheter replacements, antibiotics, and emergency care. Blockage was found to be associated with CAUTI adding further evidence reported in two smaller studies of 24[2] and 30[3] long-term catheter users.

Concluding message
This is the first known study of this size (N=202) with in-depth interviews in long-term catheter users about their practices and problems over a two month period. The sample was diverse by age, gender, race, ethnicity, and diagnosis and highly representative of long-term catheter users in the USA. These data should be useful in planning self-management interventions based on the types of problems that need to be addressed, such as identifying one's typical symptoms of CAUTI for early diagnosis and treatment, noticing when the catheter is likely to block, or awareness of the catheter position to prevent traction or accidental dislodgement.

References
1. 1. Yang J, Xie M, Ngee Goh T. Outlier identification and robust parameter estimation in a zero-inflated Poisson model. Journal of Applied Statistics. 2011;38:421-4.
2. 2. Wilde MH, Carrigan MJ. A chart audit of factors related to urine flow and urinary tract infection. J Adv Nurs. 2003;43:254-62.
3. 3. Wilde MH, Dougherty MC. Awareness of urine flow in people with long-term urinary catheters. Commentary by B. Roe. Journal of Wound, Ostomy, and Continence Nursing. 2006;33:164-75.

Disclosures