BURDEN OF ILLNESS OF URINARY TRACT INFECTIONS IN SUBJECTS WITH NEUROGENIC BLADDER DYSFUNCTION OR URINARY RETENTION: A DANISH REGISTER STUDY

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Objectives

Some people are not able to void naturally and need assistance to empty their bladder. Urinary retention (UR) and neurogenic bladder dysfunction (NBD) can be caused by a number of conditions including spinal cord injury (SCI), multiple sclerosis (MS) and benign prostate hyperplasia (BHP). The objective of this study was to describe the burden of illness derived from UTIs in subjects with bladder dysfunction due to SCI, MS or BPH.

Methods

Data were extracted from Danish national registries using ICD-10 codes to identify subjects with BD or UR due to SCI/MS or SKS-code indicating IC training and BPH. Cases were matched 1:4 to controls on age, gender, marital status, municipality, educational level, and index year. Inclusion period was 2002-2016 and follow-up 1 year from index date.

Results

2.132 people with SCI, 1.887 with MS and 4.758 with BPH were identified. Mean age and gender split m/f was 57 years and 70%/30% for SCI, 53 years and 63%/37% for MS, 70 years and 100% male for BPH.

Compared to their controls the three populations encountered, per patient-year, significantly more UTI related hospital admissions and significantly more days in hospital related to UTIs. This is mirrored in significantly higher UTI related inpatient costs per patient-year. Urosepsis inpatient costs per person-year is found to be 16-27 times higher in the study populations indicating a higher risk of urosepsis for these groups (table 1).

According to top 20 reasons for hospital admissions and emergency room (ER) visits disease and conditions related to the urinary tract are common. Complications related to indwelling catheters were in particular a common reason for ER visits (table 2).

Table 1: Health care encounters and costs related to urinary tract infections

	SCI cases	SCI controls	MS cases	MS controls	BPH cases	BPH controls
UTI related hospital admission, per person-year	0,11*	0,004	0,12*	0,002	0,10*	0,01
Days in hospital related to UTIs, per person-year	0,86*	0,02	0,66*	0,005	0,48*	0,04
UTI inpatient costs per person-year, €	544*	23	497*	6	479*	31
Cost per UTI admission, €	4.322	4.318	3.980	2.942	4.359	4.987
Urosepsis inpatient costs per person-year, €	192*	7	-	-	209*	13
Cost per urosepsis admission, €	7.330	6.852	6.615	-	6.460	8.084

UTI cluster includes urosepsis. Blank cell: <4 observations. *Significantly different from control group

Table 2. Top 20 reasons for hospital admissions

	SCI cases	MS cases	BPH cases
Total number of hospital admissions, N	5.018	2.389	5.418
Top 20 share of admissions related conditions in the urinary tract	7/20	11/20	10/20
% of hospital admissions related to complication with indwelling catheter	1,6	1,5	0,8
Total number of ER visits	1.460	974	1.574
Top 20 share of ER visits related to conditions in the urinary tract	7/20	8/20	9/20
% of ER visits related to complication with indwelling catheter	13,3	16,5	7,4

Discussion

In this study we found a high risk of hospitalization due to UTIs in people with urinary retention or neurogenic bladder dysfunction leading to a high burden for both patients and society. We have not been able to investigate UTIs treated in primary care since diagnoses given by general practitioners are not linked to the national registers and therefor it must be assumed that the UTI rates found in this study are conservative.
One of the biggest risk factors for getting a UTI is using a urinary catheter. The gold standard of bladder management for people with urinary retention is intermittent catheters (Blok et al 2015 & Pannek et al 2013). This is primarily due to a lower risk of infection compared to alternatives like indwelling catheters. It was apparent when looking at ER visits that some people experience complications when using indwelling catheters which could indicate a higher need of care when using this bladder management solution. In this study we were unfortunately not able to compare different bladder management methods to each other as outpatient medical devices, such as catheters, are not included in the National Danish registers.

Conclusion

People suffering from UR or NBD dysfunction due to SCI, MS and BPH experience high hospitalisation rates due to UTI compared to their controls which is mirrored in higher treatment cost per patient-year. Conditions related to the bladder where also found to be common cause of hospital admissions and ER visits. This emphasis a need to focus on better bladder management including managing UTI risk factors in these populations with bladder dysfunction. Further studies are needed to fully understand the burden related to bladder dysfunction and to uncover the best ways to support patients and help raise the standard of care.

Acknowledgements

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Reference: Blok, B., et al. (2015). *Guidelines on Neuro-Urology*, European Association of Urology. Pannek, J., et al. (2013). *Guidelines on Neurogenic Lower Urinary Tract Dysfunction*, European Association of Urology