

Neurogenic bladder evaluation and management after spinal cord injury: Current practice among urologists working in Saudi Arabia

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Abstract

Aim: The aim of this study is to determine the current trends in the management and surveillance of the NB population secondary to spinal cord injury (SCI) or myelomeningocele by certified urologist working in Saudi Arabia and to compare it to the current guidelines.

Materials and Methods: A cross-sectional study was conducted using a 12-points questionnaire distributed to urologists working in Saudi Arabia and registered at the Saudi medical association. The assessment and follow-up of upper and lower urinary tract function in neurogenic bladder patients, their optimal frequency and management of related infections were the topics of inquiry.

Results: Of the 272 urologists surveyed, 105 responded, yielding a response rate of 38%. Eighty-nine percent of respondents said that ultrasound was their diagnostic tool of choice for upper tract evaluation. Sixty-one percent of respondents said that they would follow their patients with a multichannel urodynamic study. Forty percent of urologists stated that they would treat asymptomatic bacteriuria. Clean intermittent catheterization (CIC) was the most common modality chosen for the management of neurogenic bladder in patients with emptying difficulties.

Conclusion: This study confirms that most urologists in Saudi Arabia involved with neurogenic bladder management. However, more than one third of the urologists do not have urodynamic machine and only two of the reporting practitioners has a videourodynamic machine. The results emphasize the need for clear guidelines in this field of urology in Saudi Arabia. Highly specialized rehabilitation centers for neurogenic bladder secondary to SCI are required for optimal care and urologist teaching.

Key Words: Spinal cord injury, neurogenic bladder, urologists, Saudi Arabia

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INTRODUCTION

As healthcare delivery has recently improved in Saudi Arabia

and worldwide, life expectancy after spinal cord injury (SCI) has increased. Living with a disability becomes a fact for many SCI patients, with different problems presenting at different stages in life.

The management of neurogenic bladder (NB) and voiding dysfunction is an important issue in rehabilitation programs for SCI because it affects the morbidity of patients.^[1] In a study by the Model Spinal Cord Injury Systems of Care, 81% of patients had some degree of impaired bladder function at one year after injury.^[2] The impairment of bladder function

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in patients with SCI results in a high risk of urinary tract deterioration, which increases morbidity and occasionally increases mortality.^[3]

The urological complications of NB consist of an inability to empty the bladder, as well as urinary tract infections (UTIs), incontinence, and upper tract deterioration. The principal goals of managing NB are preservation of renal function and prevention of renal failure. This is achieved via low pressure filling and emptying, combined with minimal residual. The most appropriate methods of bladder management should be implemented based on the findings of a previous urodynamic study.^[4] Various approaches to managing urinary disorders have been developed in recent years, and different therapies have become available, ranging from the ingestion of active drugs, as well as the use of clean intermittent catheterization (CIC) and the insertion of endourethral prosthetic devices to surgery.

Urologists who manage SCI patients with NB were surveyed in many countries.^[5,6] Surveyed consultant urologists in spinal injuries units in the UK and Ireland with regard to different aspects of NB and voiding dysfunction. In that study, the frequency of visits, protocols for urinary tract infections, and the need for routine urodynamics were the subjects of debate. Blok *et al.* surveyed Canadian urologists on their management of NB;^[8] however, the response rate was low. Methods for evaluating the lower urinary tract and the treatment of symptomatic urinary tract infections were the subjects of debate.

The aim of this study is to determine the current trends in the management and surveillance of the NB population secondary to SCI by urologists working in Saudi Arabia and registered at the Saudi medical council.

MATERIALS AND METHODS

A cross-sectional study was conducted using a 12-points questionnaire [Appendix I] emailed, mailed or faxed to 272 urologists practicing in Saudi Arabia in secondary and tertiary health care facilities. The assessment and follow-up of upper and lower urinary tract function in NB patients, their optimal management of related infections, and common management modalities for NB patients were the topics of inquiry. The survey was undertaken on a voluntary and anonymous basis. No direct patient information was released, and responses were received as return documents.

RESULTS

Of the 272 urologists surveyed, 105 responded, yielding a response rate of 38%. Of the respondents, 54% saw one to five NB patients per month, while only 10% saw more than

Table 1: Number of neurogenic bladder patients seen by urologists per month

| Number of patients seen per month | No. of urologists | Percentage |
|-----------------------------------|-------------------|------------|
| 0 | 0 | 0 |
| 1-5 | 57 | 54 |
| 6-10 | 37 | 34 |
| 11-15 | 3 | 2 |
| More than 15 | 11 | 10 |

15 patients per month [Table 1].

Upper tract evaluation

Eighty-nine percent (n=94) of respondents believed that upper tract ultrasound was the diagnostic tool of choice for routine surveillance of the upper tracts. Eleven percent favored intravenous urograms (IVUs) instead of a renal ultrasound. Computed tomography (CT) scans and magnetic resonance imaging (MRI) were not chosen by any of the respondents. Sixty percent of the respondents planned to repeat their diagnostic study in every six months, while 30 and 10 % planned to do it in every one and two years, respectively.

Lower tract evaluation

With respect to the lower urinary tract, 61% (n=64) of respondents plan to follow their patients with a multichannel urodynamic study, while 34% (n=25) will perform a voiding cystourethrogram (VCUG). Five percents will perform videourodynamics. Sixty-two percent (n=65) will repeat the study every year. The remaining 20% will do it in every two years, and 12% will do it whenever the patients' symptoms deteriorate. Moreover, 38% of respondents reported that they do not have a urodynamic machine, and two of them had videourodynamics.

Urinary tract infection

Urinalysis was performed by respondents in every three months, six months, one year and two years by 20, 14, 56 and 10% of physicians, respectively. Forty percent (n = 42) of respondents said that they would treat asymptomatic bacteriuria. Symptomatic urinary tract infection (UTIs) would be treated for 5, 7, 10, and 14 days by 20, 33, 17 and 30% of respondents, respectively.

Management

CIC was the most common modality for managing NB in patients with emptying difficulties (90%, or n=94), whereas 85% of respondents plan to add anticholinergic medications to CIC if intravesicle pressures remain high (due to neurogenic detrusor overactivity) after the use of CIC alone. After failure of CIC and anticholinergics, physicians used Botox injections (43%), bladder augmentation (50%), and Sphincterotomy

(7%). Of the respondents, 52% think that they appropriately manage their patients, and 48% think that they should refer their patients to a tertiary care hospital.

DISCUSSION

SCI and voiding dysfunction are closely related, and the follow-up of neurogenic bladder patients is traditionally focused on the prevention of upper tract deterioration and maintaining the quality of life.

Response rate to the survey by Razdan *et al.*^[7] and Kitahara *et al.*^[5] were 60 and 43.2%. In contrast, Blok *et al.*^[8] had a 15% response rate among members of the Canadian Urology Association; however, in this study, urologists from all over Saudi Arabia were asked to complete a survey [Appendix 1], and 105 responded, for a response rate of 38%.

Linsenmeyer and Culkin^[9] reported the neurologic care of SCI patients in the American Paraplegic Society (APS) Guidelines on urologic care of SCI patients. Annual follow-up including evaluation of upper and lower tract is recommended for the first 5 to 10 years after the injury. If the patient is doing well, then follow-up in every other year is acceptable. However, Burns *et al.*^[10] recommended at least plain films and nuclear renal scans. However, the decrease of more than 20% in renal plasma flow warrants further investigation.

Concerning the evaluation of the upper urinary tract, 89% of our respondents performed an ultrasound examination, with 60% reporting that they would do it in every six months. In Japan,^[5] 71.8% reported using ultrasound. Eighty-five percent of Americans will perform an ultrasound examination every year.^[7] In contrast, IVU was utilized by 25.8% of responders in Japan, while in Saudi Arabia, 11% said that they would utilize IVU as the initial diagnostic modality. The reason underlying the frequent use of ultrasound is the wide availability of ultrasound in comparison to other radiological investigations. It is recommended to evaluate the upper tract in every six months by ultrasound.^[11]

The European Association of Urology (EAU) guidelines^[11] advise physicians to classify patients with neurological lesions in low and high-risk bladder categories on the basis of their filling cystometry and pressure flow studies, which should be repeated in every one-two years or when patient's condition deteriorate. Urodynamic evaluation was recommended by the APS at the same intervals as upper and lower tract screening. Cystoscopy was recommended annually for those patients with an indwelling catheter.^[9] Regarding the evaluation of the lower urinary tract (LUT), 61% of respondents performed multichannel urodynamic examination in Saudi

Arabia, with 65% of respondents saying that they plan to re-evaluate their patients annually, and with only 5% including a videourodynamic examination. In Japan,^[5] more than half of the respondents (52.3%) use cystometry, and only 9.9% use videourodynamic techniques. In the USA, 65% of respondents performed a videourodynamic examination.^[7] However, 35% of USA respondents examined their patients only when the patients had repeated UTIs or when an abnormality was found in a renal scintigram or ultrasound.^[7] Watanabe *et al.*^[4] reported that the most appropriate method of bladder management should be implemented on the basis of urodynamic studies. However, in this study, we found that 38% of respondents do not have a urodynamic study machine and only two have videourodynamic machines. This may be due to lack of resources and/or lack of experts operating urodynamic machines.

UTIs are one of the important causes of morbidity,^[12,13] and they are the most frequent complication in patients with SCI.^[14] Asymptomatic bacteriuria reaches prevalence rates of up to 70% in SCI patients undergoing CIC.^[15] Factors increasing the risk of infection include over-distention of the bladder, vesico-ureteric reflux, high pressure voiding, large post-void residuals and stones in the urinary tract.^[16] Antiseptics have not demonstrated efficacy in preventing UTI in SCI patients.^[17] Urinalysis should be performed in every two months.^[21] In our study, 40% of respondents said that they treat asymptomatic bacteriuria. Bycroft^[6] found that only one unit treated asymptomatic bacteriuria in patients with permanent indwelling catheters. Dutch^[18] and Canadian^[8] urologists rarely treat asymptomatic urinary tract infections in CIC. The Infectious Disease Society of America (IDSA)^[19] does not recommend screening and treatment of asymptomatic bacteriuria since reinfection strains show increased antimicrobial resistance. When 52 patients with a relatively recent onset of SCI were observed prospectively for 4–26 weeks, 78% of weekly urine cultures were positive, but only six symptomatic episodes occurred, all of which responded promptly to antimicrobial treatment.^[20] Symptomatic LUT infections were treated for seven–nine days on average by Dutch urologists,^[18] while most of our respondents said that they treat the patients for 7 to 14 days. However, the EAU guidelines recommend 7–10 days of treatment for a symptomatic UTI.^[21]

For the treatment of NB, CIC was the most common modality for managing patients with emptying difficulties (90%, or n = 94), whereas 85% of surveyed participants said that they would add an anticholinergic drug to CIC if intravesical pressure remained high or the patient remained incontinent due to detrusor overactivity after the use of CIC alone. This is comparable to American respondents, 84% of whom

said that they would use a combination of anticholinergic agent(s) with CIC for the treatment of NB overactivity. EAU guidelines recommend anticholinergic drugs for patients with detrusor overactivity, and intermittent catheterization as the first line management for patients who are unable to empty their bladder.^[11]

Our study is limited by the low response rate from the urologist; however, majority of the urologists in our study involved with neurogenic bladder management. We strongly recommend that the urologists in Saudi Arabia need to follow a clear guideline in neurogenic bladder management to optimize patient care, and urodynamic machine should be available in every urology department to cover the demand of this investigation to treat

this kind of patients.

CONCLUSION

This study confirms that most urologists in Saudi Arabia involved with neurogenic bladder management. However, more than one third of the urologists do not have urodynamic machine and only two of the reporting practitioners has a videourodynamic machine. The results emphasize the need for clear guidelines in this field of urology in Saudi Arabia. The presence of urodynamic machines and training of technicians and urologists to operate them are necessary for effective management of neurogenic bladder in SCI patients; however, highly specialized rehabilitation centers for SCI patients are required for optimal care and teaching.

APPENDIX 1

Your Name:

(This is used purely to keep track of who has replied to the questionnaire)

Medical Degree:

1. How many spinal cord injury patients with neurogenic bladder do you see every month?
 - a. 0
 - b. 1-5
 - c. 6-10
 - d. 11-15
 - e. more
- 2a. How would you follow the upper tract?
 - a. Ultrasound
 - b. Intravenous pyelogram
 - c. CT abdomen
 - d. MRI abdomen
- 2b. How often would you repeat it?
 - a. 3 months
 - b. 6 months
 - c. 1 year
 - d. 2 years
 - e. Other, please specify _____
- 3a. How would you follow the lower urinary tract?
 - a. Urodynamic eyeball
 - b. Urodynamic multichannel
 - c. Urodynamic video
 - d. VCUG
- 3b. How often would you repeat it?
 - a. 3 months
 - b. 6 months
 - c. 1 year
 - d. 2 years
 - e. Other, please specify _____
4. How frequently would you perform urine analysis and culture?
 - a. 3 months
 - b. 6 months
 - c. 1 year
 - d. 2 years
 - e. Other, please specify _____
5. If the patient has asymptomatic bacteriuria, would you treat it?
 - a. Yes
 - b. No
6. If you elected to treat it, for how long would you treat it?
 - a. 5 days
 - b. 1 week
 - c. 10 days
 - d. 2 weeks
7. If the patient has symptomatic urinary tract infection, for how long would you treat it?
 - a. 5 days
 - b. 1 weeks
 - c. 10 days
 - d. 2 weeks
8. How would you treat your patient if they were unable to empty their bladder?
 - a. Indwelling catheter transurethral
 - b. Suprapubic catheter
 - c. Clean intermittent catheterization
 - d. Diaper
 - e. Condom catheter
 - f. Other, please specify _____
9. If your patient has high filling pressure and incontinence while on CIC only what is the next step?
 - a. Anticholinergic
 - b. Bladder augmentation
 - c. Botox
10. If during treatment the patient has high filling pressure and incontinence whilst on CIC and on anticholinergic medication, what is your next step?
 - a. Bladder augmentation
 - b. Botox injection
 - c. Other, please specify _____
11. Does your hospital have a urodynamic machine?
 - a. Yes
 - b. No

If yes, please specify how old and what type of machine _____
12. Do you think patient with neurogenic bladder are appropriately managed in your institution or should be referred to a tertiary care hospital?
 - a. Managed appropriately
 - b. Referred to tertiary care

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