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Research Article

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Lower Urinary Tract Management Protocoll of Patients with Spinal Cord Injury. The Contribution of the Nursing Staff

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Abstract

Purpose: *To demonstrate the contribution of rehabilitation nurses to the management of lower urinary tract dysfunction (LUTD) of spinal cord injury (SCI) patients*

Method: *A micturition dysfunction protocol was implemented to our SCI patients with neurogenic bladder dysfunction that were admitted to our rehabilitation clinic, in order to prevent complications, to reassure a without residual volume or incontinence bladder emptying, with low bladder detrusor pressure. We analyzed the bladder-sphincter mechanism of the LUT. The study includes patients with cervical, thoracis and lumbar spinal cord injury as well as patients with cauda equina syndrome. All patients during admission to the rehabilitation clinic had indwelling catheter. To all patients with suprasacral lesion anticholinergic drug was administered to prevent risk of detrusor hyperactivity. The patients were assessed our medical rehabilitation specialist team, urinary tract ultrasound and urine analysis and urine culture were performed. To all male patients with suprasacral lesion an a-blocker was added to their medication before removing the indwelling catheter. Patients with incomplete SCI were set under a protocol of intermittent catheterization in order to supervise their neurogenic bladder and alter the prescribed medication according to their needs. Patients with complete suprasacral SCI were treated with antimuscarinic drugs and were educated in intermittent catheterization technique so as to assure a regular bladder voiding under low intradetrusor pressure. Patients with sacral spine lesions present significant difficulty in the management of their neurogenic bladder.*

Conclusion: *The training of the rehabilitation clinics nursing staff and their involvement in the management of SCI patient's neurogenic bladder is crucial to the success of the process, the lower urinary tract safety, a successful rehabilitation program and the social integration of the patient.*

Keywords: Spinal Cord Injury (SCI), Lower Urinary Tract Dysfunction (LUTD), Rehabilitation Nursing, Intermittent Catheterization..

Introduction

In order to understand the pathophysiology of urination, one must first be familiar with its physiology. Located in the brain is the pontine micturition center, specifically Barrington's nucleus, which is responsible for both the voiding of the urinary bladder and continence—via stimulation of the M-region and L-region,

respectively [1-4]. The pontine micturition center is regulated by cortical centers. When the urinary bladder becomes full, afferent signals are transmitted to the pontine micturition center, which, under the control of higher cortical centers, allows the individual to consciously decide whether to void or to retain urine [5].

Normal urination consists of passive bladder filling at low pressure during the storage phase, followed by the voiding phase, which requires a coordinated contraction of the detrusor muscle and relaxation of the sphincteric mechanism [6]. This process is regulated by the central nervous system, which integrates sympathetic and parasympathetic activity with somatic innervation, ultimately enabling normal urination without leakage.

Neurogenic lower urinary tract dysfunction is defined as any disorder of the nervous system affecting the control of the lower urinary tract, including the peripheral nerves of the pelvis [7].

Depending on the location and extent of the lesion, different types of "neurogenic bladder" may present. In patients with spinal cord injury, the occurrence of neurogenic bladder is also observed in individuals with multiple sclerosis (MS), with a reported prevalence ranging from 50% to 90%. Among patients with spinal cord trauma, the prevalence ranges from 70% to 84%. The highest prevalence is observed in individuals with myelomeningocele, reaching approximately 95% [7-9].

Furthermore, 22% of patients with dural metastases from renal cancer are expected to develop neurogenic bladder. Similarly, 42% of patients with central cord syndrome present with neurogenic bladder upon admission.

The goals of neurogenic bladder management are to ensure the proper function of both the upper and lower urinary tract, to reduce complications, and to establish a method of urinary control that is compatible with the patient's daily lifestyle—ultimately aiming to improve quality of life [10].

Methodology

The evaluation of neurogenic bladder involves a comprehensive medical history, physical examination, voiding diary, assessment of voiding patterns, and measurement of post-void residual urine, either with a bladder scanner or via intermittent catheterization.

Timely and targeted identification of symptoms is crucial for maintaining the patient's quality of life, self-esteem, and for preventing complications. Emphasis must be placed on obtaining a detailed medical history, recognizing that bladder and bowel dysfunctions often remain taboo topics for many patients. The development and use of screening tools can be highly beneficial in detecting dysfunction. Questionnaires should be easy to complete, comprehensible, and time-efficient, without requiring specialized knowledge.

The Physical Examination Includes

Evaluation of sensory function, assessment of voluntary anal contraction, testing of the cremasteric and bulbocavernosus reflexes, inspection of the perineal area, identification of any cystocele, and evaluation for prostate hypertrophy (in male patients).

The daily voiding diary is a relatively simple but particularly valuable tool, typically completed by the rehabilitation nurse. It can be maintained for a few days up to a week, recording hourly fluid intake and all types of urine output—including voluntary urination, leakage episodes, and intermittent catheterization.

This diary provides data on fluid balance, frequency and quality of voiding, effectiveness of catheterization, presence or absence of urine leakage, and allows for comparison over time (e.g., before and after therapeutic interventions). It also enables estimation of post-void residual urine by measuring after catheterization, taking into account total fluid intake, and provides insights into patient compliance with the prescribed bladder management protocol.

Laboratory and imaging investigations are also essential. As demonstrated in ascending cystography, a neglected bladder may show thickening of the bladder wall and bilateral vesicoureteral reflux—i.e., retrograde flow of urine toward the kidneys. Such findings are indicative of neurogenic bladder and necessitate the initiation of appropriate management.

Ultrasound of the kidneys, ureters, and bladder (KUB) is also important to evaluate bladder wall morphology, presence of bladder or kidney stones, and, in male patients, to assess for prostatic hypertrophy.

This study aims to demonstrate the contribution of rehabilitation nurses to the management of lower urinary tract dysfunction (LUTD) of spinal cord injury (SCI) patients.

A micturition dysfunction management protocol was implemented for spinal cord injury (SCI) patients with neurogenic bladder dysfunction admitted to our rehabilitation clinic. The aim was to prevent complications and to ensure complete bladder emptying without residual volume or incontinence, under conditions of low detrusor pressure.

Results

The study focused on analyzing the bladder-sphincter mechanism of the lower urinary tract (LUT). It included patients with cervical, thoracic, and lumbar spinal cord injuries, as well as patients diagnosed with cauda equina syndrome. All patients were admitted with an indwelling urinary catheter in place. In cases of suprasacral lesions, an anticholinergic agent was administered to prevent detrusor overactivity. Male patients with suprasacral lesions also received an alpha-blocker prior to catheter removal, as part of the standard protocol.

Patients were evaluated by our multidisciplinary rehabilitation medical team. Assessments included urinary tract ultrasound, urinalysis, and urine culture. Patients with incomplete SCI were managed with a protocol of intermittent catheterization, allowing close monitoring of neurogenic bladder function and timely adjustment of pharmacological treatment according to individual needs. Patients with complete suprasacral SCI were treated with antimuscarinic agents and trained in intermittent catheterization techniques, in order to achieve regular bladder emptying with low intradetrusor pressures.

In contrast, patients with sacral spinal cord lesions presented sig-

nificant challenges in the management of their neurogenic bladder, due to the complexity and variability of their dysfunction.

Conclusion

In conclusion, the training of the rehabilitation clinic's nursing staff and their involvement in the management of SCI patients with neurogenic bladder is crucial to the success of the process, ensuring the safety of the lower urinary tract, a successful rehabilitation program, and the social integration of the patient. Proper training and support of nurses guarantee the safety of the lower urinary tract, facilitate effective rehabilitation, and promote the patient's social comfort.

Through this process, improvements in the patient's quality of life and enhancement of their independence are achieved. Nurses play a critical role in supporting and monitoring patients throughout the rehabilitation process. Therefore, their education and active engagement are essential components of comprehensive patient care.

References

1. de Groat, W. C., Griffiths, D., & Yoshimura, N. (2015). Neural control of the lower urinary tract. Comprehensive Physiology, 5: 327-396.
2. Fowler, C. J., Griffiths, D., & De Groat, W. C. (2008). The neural control of micturition. Nature Reviews Neuroscience. 9: 453-466.
3. Ito, H., Sales, A. C., Fry, C. H., Kanai, A. J., Drake, M. J., & Pickering, A. E. (2020). Probabilistic, spinally-gated control of bladder pressure and autonomous micturition by Barrington's nucleus CRH neurons. Elife. 9: e56605.
4. Valentino, R. J., Wood, S. K. (2005). Role of Barrington's nucleus in micturition and stress-induced bladder dysfunction. Am J Physiol Regul Integr Comp Physiol. 289: R1220-R1229.
5. Holstege, G. (1987). Anatomical study of the final common path in man: the anatomical basis of the voluntary control of the micturition reflex. J Comp Neurol. 258: 362-375.
6. Yoshimura, N., & Chancellor, M. B. (2003). Neurophysiology of lower urinary tract function and dysfunction. Reviews in urology, 5(Suppl 8), S3.
7. Memou, N., & Vlamis, J. (2023). Bladder and Bowel Dysfunction in Patients with Spinal Cord Injury–Nursing Intervention. Acta Orthopaedica Et Traumatologica Hellenica. 74.
8. Neurogenic bladder in patients with traumatic spinal cord injury: treatment and follow-up. Spine. 39: 244-251.
9. Kessler T.M., (2022). Bladder management in individuals with spinal cord injury or disease during and after primary rehabilitation: a retrospective cohort study. Arch Phys Med Rehabil.103: 902-909.
10. Welk B., (2020). Clinical protocol for identifying and managing bladder dysfunction during acute care after traumatic spinal cord injury. J Neurotrauma. 37:1484-1493.