

Effect of continuous care intervention on the quality of life in patients with neurogenic bladder dysfunction

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Abstract

Objective: This study aimed to evaluate the effect of continuous care intervention on the quality of life (QoL) of patients with neurogenic bladder.

Methods: Eighty-two patients with neurogenic bladder dysfunction caused by spinal cord injury were included into the study. All of the patients had continuous care intervention (for 3 months), including clean intermittent self-catheterization, drinking guidance, and bladder training guidance. A health record was established for each patient before discharge and was used to record changes in the patients when followed up. Scores of QoL, which were based on the World Health Organization Quality of Life-BREF, occurrence of complications, and compliance of all patients were recorded.

Results: After 3-month care intervention, there were significantly fewer complications than before the intervention. Patients' compliance and QoL were significantly higher after 3 months of care intervention than before the intervention.

Conclusion: Continuous care intervention can improve patients' compliance and reduce urinary complications.

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Keywords

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Introduction

Spinal cord injury (SCI) produces a wave of repercussions in many organ systems and these subsequently adversely affect patients' quality of life (QoL).¹ Clinically, the incidence of SCI has a significant upward trend. SCI affects approximately 2.5 million people worldwide and there are approximately 130,000 new cases of SCI each year.² In China, the annual incidence of SCI in Beijing is approximately 60 people per million, which is nearly 10 times higher than that in 1986.³ Neurogenic bladder dysfunction (NBD) due to central and/or peripheral nervous system diseases is one of the most challenging problems in urological practice. Almost 80% of patients with SCI report some degree of NBD within 1 year of injury every year.¹ NBD substantially deteriorates patients' QoL with severe complications if not effectively managed and monitored.⁴⁻⁶ Additionally, urological complications, such as urinary tract infections, have been described as the leading cause of reestablishment after traumatic SCI.^{7,8}

Continuous care intervention is an important part of rehabilitation treatment for patients with NBD. The goal of continuous care intervention is to maintain continence, prevent urological complications, and preserve upper or lower urinary tract function to make bladder management compatible with the person's lifestyle and environment.⁹ Conservative bladder-emptying methods include clean intermittent catheterization (CIC), use of an

indwelling transurethral catheter, and bladder reflex triggering. Previous studies have reported that QoL appears to be most affected in people who use CIC by an attendant and live in The Netherlands.¹ To the best of our knowledge, there have been few reports on evaluation of continuous care intervention on the QoL of patients with NBD in China.

This study was conducted to investigate the effect of continuous care intervention on QoL of Chinese patients with SCI and NBD. Patients' QoL scores, occurrence of complications, and patients' compliance were investigated and compared before and after continuous care intervention.

Materials and methods**Patients**

This study was approved by the Ethics Committee of Sichuan Provincial People's Hospital (no. 2012.59). Informed consent was obtained from all patients. We used a paired design before and after the intervention with a cross-sectional survey of patients with SCI and NBD who received 3 months of continuous care intervention. Inclusion criteria were as follows: (1) patients with SCI and NBD; (2) primary lesions had been treated; (3) being able to conduct urethral catheterization alone or under the assistance of families; (4) without obvious urethral obstruction and infection; (5) normal communication between patients and caregivers; (6) and having continuous care intervention. Exclusion criteria were

as follows: (1) patients with serious mental diseases or dysgnosia, (2) serious heart, lung, liver, and kidney dysfunction; (3) abnormal anatomical urethral structures, urethral tumors, urethral injuries, and infection.

Continuous care intervention

All patients were provided continuous care intervention once they were discharged. This included clean intermittent self-catheterization, drinking guidance, and bladder training guidance. Daily drinking was guided by doctors and adjusted according to the illness condition and the patient's living habit. Generally, the total intake of water was less than 2000 mL, including milk, gruel, and fruits, while diuresis drinks, such as coke, beer, and juice, were not allowed. Drinking after 22:00 hours was suggested to be avoided. To improve compliance of the drinking plan, nurses sent a copy of the drinking plan's record of implementation to each patient. Nurses then told the patients how to drink correctly and record, check the implementation condition of the drinking plan of each patient, and provide guidance to correct unreasonable conditions in a timely manner. Bladder training for the patients was performed by specialized nurses. Before guidance training, a urodynamic check-up was performed to determine patients' bladder types and the training plans. Training was unsuitable for patients with detrusor-sphincter dyssynergia. For patients with bladder spasm, careful attention needed to be paid to autonomic dysreflexia and it need to be managed in a timely manner. The training was stopped when patients felt fatigue. To obtain good results, the training was performed in continuous fashion for an appropriate period. To improve compliance of the bladder training plan, nurses trained the patients or their families, and sent a copy of the bladder training plan's record of implementation to each patient. Nurses

then told patients how to record and check the implementation conditions of the bladder training plan, and how to correct unreasonable conditions in a timely manner.

Bladder retraining instruction was then conducted according to individual conditions. When behavioral training was performed, a habit of urination at a regular time developed. Depending on the bladder volume and daily activity, the patients attempted to complete urination. Generally, the urination interval was scheduled as 3 hours in the daytime and two times in the night. For patients with urgent urination or reflective urinary incontinence, the urination interval was approximately 3 to 4 hours. Training for bladder control was performed as follows. The patients were told to imagine that they were in a quiet and spacious bathroom, listening to the sound of a running stream, when they tried to urinate. Additionally, visual feedback was helpful and the patients watched the urination process. Training for reflexive urination was also performed. Half an hour before urination, the patients attempted to find the trigger point. When training for compensatory urine output, the patients were in the seated position with the body leaning forward. The patients remained breathless and performed movements as if they were to defecate to induce urination. Pelvic muscle training was as follows. The patients inhaled air and tightened their pelvic floor muscles for 5 to 10 seconds, and then exhaled and relaxed. This procedure was repeated for 10 to 20 times and carried out three to four times/day. The bridge exercise was performed by the patient inhaling and contracting the pelvic muscles for 10 seconds and then relaxing. Additionally, the patient slowly pulled the anus, relaxed the pelvic muscles, remained breathless, and attempted to empty the bladder. Sitting position exercise was performed with the patient in the seated position and he/she attempted to contract the

pelvic muscles from posteriorly to anteriorly for 10 seconds.

Follow-up

A health record was established for each patient before discharge and used to record changes in the patient when followed up. After discharge, the patients were told to telephone and consult the doctor at no cost if they encountered any issues. The patients were followed up by telephone or a home visit according to the patients' condition (1 week, 2 weeks, 1 month, and 3 months), and they were also supplied with some suggestions and guidance on a regular basis. The patients' QoL was based on the World Health Organization Quality of Life-BREF¹⁰ instrument and compliance, and complications were recorded. QoL was assessed by an experienced data collection group, which consisted of a certified clinical nurse specialist, a certified counseling psychologist, and a graduate nurse in the nursing department. Neurogenic bladder complications, such as urinary tract infection, urethral injury, and urinary stones, and patient compliance, such as clean intermittent and self-catheterization, a drinking plan, and self-bladder training, were recorded before and at the end of the continuous care intervention.

Statistical analysis

All data were analyzed using SPSS 19.0 (SPSS Inc., Chicago, IL, USA). The data are presented as mean \pm standard deviation or percentage. The paired t-test and

chi-square test were used to compare the patients' QoL before and after the continuous care intervention. P values < 0.05 were considered as statistically significant.

Results

Between June 2014 and December 2015, 82 patients (52 men, 30 women; mean age: 45.3 ± 3.2 years; range: 18–72) who had care intervention performed were included. Fifteen (18.3%) patients had a bachelor degree or higher, 40 (48.8%) had specialist qualifications, and 26 (31.7%) had no degrees.

After 3-month continuous care intervention, the patients' QoL score, including the body function score, society function score, and role function score, were significantly higher than those before intervention (all $P < 0.05$, Table 1). With regard to urinary system complications, rates of complications in patients, including urinary tract infection, urinary stones, hydronephrosis, and urethral injury, were significantly less after continuous care intervention than before intervention (all $P < 0.05$). The patients' rate of compliance, including clean intermittent self-catheterization, a drinking plan, and bladder training guidance was significantly higher after continuous care intervention than before intervention (all $P < 0.01$, Table 2).

Discussion

NBD has a high incidence in China, and there is an increase of approximately

Table 1. Scores of quality of life before and after 3-month care intervention (n = 82).

	Before	After	T value	P value
Body function score	63.17 \pm 8.12	79.62 \pm 8.61	-3.254	0.001
Society function score	42.14 \pm 5.13	68.27 \pm 15.52	-6.164	0.000
Role function score	37.54 \pm 5.18	51.16 \pm 11.23	-4.075	0.001
Overall score	34.35 \pm 8.13	59.12 \pm 9.16	-6.098	0.000

Table 2. Urinary system complications and patients' compliance before and after 3-month care intervention (n = 82).

	Before		After		χ^2	P value
	Number of cases	%	Number of cases	%		
Urinary tract infection	32	39.0	15	18.3	8.62	<0.01
Urethral injury	19	23.1	8	9.8	5.36	<0.05
Urinary stones	13	15.9	5	6.1	3.99	<0.05
Clean intermittent self-catheterization	62	75.6	76	92.7	8.96	<0.01
Drinking plan	58	70.7	72	87.8	7.27	<0.01
Self-bladder training	53	64.6	68	82.9	7.09	<0.01

50000 new patients with NBD every year.¹¹ Patients with NBD are usually treated in hospital during the acute phase and in early rehabilitation, and then they are discharged. However, rehabilitation and reconstruction of bladder function is a long process.¹² Discharged patients usually lack correct bladder self-management guidance, which may lead to a series of complications, such as urinary tract infection, urethral injury, and kidney damage. These patients' QoL can be seriously affected.¹³ Therefore, a long-term, non-invasive community therapy and continuous care intervention could be an important part of rehabilitation treatment for these patients.

The bladder emptying method includes as a set of six dummy variables with CIC as the reference category because CIC has been described as the gold standard for emptying of the bladder.⁴ In our study, we performed continuous care intervention for patients with NBD when they were discharged, in whom clean intermittent self-catheterization was primarily used. This proved to be a satisfactory care intervention method. This method helped to remove patients' worries regarding bladder management. Correct bladder self-management was emphasized and effectively supervised, thus reducing urinary complications and gradually restoring bladder function. In

the present study, we found that after continuous care intervention for 3 months, the complication rate was significantly decreased, including the rates of urinary stones, urethral injury, urinary tract infections, and hydronephrosis.

Previous studies have shown that neurogenic lower urinary tract dysfunction is associated with lower QoL in patients with SCI.^{4,14} Additionally, some studies have reported that QoL appears to be most affected if CIC is performed by a nurse attendant.^{15,16} In this study, we found that the patients' QoL was significantly improved after continuous care intervention compared with before intervention, including body function, society function, and role function. The patients' compliance rate, such as clean intermittent self-catheterization, a drinking plan, and bladder training guidance, was significantly higher after continuous care intervention than before intervention.

Before we conducted the study, we considered the possible issues of natural healing and adaptation. While reviewing the literature, we found that urinary storage and voiding dysfunction caused by neurogenic bladder has a long course of disease according to care guidelines for neurogenic bladder (Rehabilitation Nursing Committee of the Chinese Association of Rehabilitation

Medicine, 2011). Therefore, natural healing can be excluded within a short duration of NBD. In this study, we used a paired design before and after the intervention, and the intervention time was only 3 months. Therefore, there was little natural healing and adaptation in this study and their effect on our results are likely to be negligible.

The current study has limitations because of its retrospective nature. First, the number of patients was relatively small. Second, the current study lacked a control group. Third, the methodology was relatively weak. Therefore, further studies with a larger number of samples and a control group are required to confirm our results through appropriate methodology.

Conclusion

In conclusion, this study shows that continuous care intervention can improve patients' compliance, reduce urinary complications, and play a positive role in improving QoL in patients with NBD.

Declaration of conflicting interest

The authors declare that there is no conflict of interest.

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