Research Advances in Comprehensive Clinical Treatment and Nursing Care for Elderly Female Patients with Urinary Incontinence: Postprint

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Date: 2023-04-24T00:00:00+00:00

Abstract

This study reviews the current domestic and international research status of elderly female patients with urinary incontinence (UI) from the perspectives of epidemiology, evaluation criteria for UI, comprehensive treatment, and nursing care, summarizes existing treatment and nursing intervention measures, and provides a basis for constructing a whole-course management system for elderly female UI patients.

Full Text

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Abstract

This review summarizes the current domestic and international research status on the epidemiology, evaluation, treatment, and nursing interventions for elderly female patients with urinary incontinence (UI). It also provides a theoretical basis for developing a comprehensive management system for this patient population.

Keywords: elderly women; urinary incontinence; integrated management; pelvic floor muscle exercise; Traditional Chinese Medicine; health education

Introduction

The International Continence Society defines urinary incontinence (UI) as intermittent or continuous, involuntary leakage of urine from the urethra caused by various factors. Epidemiological studies report that the incidence of UI is approximately [percentage missing in original]%, with higher prevalence among women and the elderly. As global population aging intensifies, the number of elderly female UI patients continues to increase, yet diagnosis and treatment rates remain suboptimal. This underutilization is closely related to insufficient knowledge among elderly women regarding UI symptoms and available treatments. This article reviews recent advances in comprehensive clinical treatment and nursing care for elderly female UI patients, providing a reference for establishing integrated management approaches for this population.

According to surgical treatment guidelines, UI is classified into four main types: stress urinary incontinence (SUI), urge urinary incontinence (UUI), overflow urinary incontinence (OUI), and mixed urinary incontinence (MUI). A comprehensive medical history should include UI type, severity, and associated symptoms such as urgency, dysuria, hematuria, recurrent urinary tract infections, pelvic surgery history, radiation history, and medication use—all of which can significantly impact UI symptoms.

1. Evaluation Criteria for UI

1.1 Bladder Diary and Automated Recording

Patients are required to record daily urine volume, voiding frequency, and UI episodes for [hours missing] consecutive hours. Traditional manual recording is prone to errors and particularly challenging for elderly patients to complete independently. With advances in internet technology, artificial intelligence applications have been developed to facilitate patient recording. Shun et al. designed an automated device that collects patient voiding data. Patients register on the device before and after voiding, and the system automatically generates a voiding diary while recording urine volume through body weight changes before and after voiding. Results demonstrated consistency with traditional manual recording while offering significantly improved accuracy and convenience.

1.2 Pad Test

The pad test recommended by the International Continence Society involves weighing sanitary pads before and after use. After voiding, patients wear preweighed pads, consume [volume missing] mL of sugar-free, non-salt water within [minutes missing] minutes, and record the completion time. Activities including climbing stairs and squatting-stand exercises are performed in sequence within [minutes missing] minutes. The pad test can predict UI severity and reflect patients' current quality of life. Notably, this test's evaluation indicators cannot be replaced by simply counting pad numbers, as pad count correlates poorly with

UI symptoms and actual urine leakage volume.

1.3 Standardized Questionnaires

Clinical practice should employ standardized scales to assess UI symptom severity and quality of life. Commonly used instruments include the International Consultation on Incontinence Questionnaire (ICIQ) and the Incontinence Quality of Life questionnaire (I-QOL). The ICIQ is currently the primary method for evaluating UI severity in women, while the I-QOL scale demonstrates good adaptability across different countries and cultures for predicting quality of life in UI patients. However, Pe et al.'s research indicates that age, education level, and occupation can affect patients' ability to complete questionnaires accurately. Therefore, comprehensive assessment of elderly UI patients should integrate questionnaire results, patient-reported symptoms, and auxiliary examinations.

1.4 Urodynamic Studies

Urodynamic studies are only appropriate for UI patients with intact neurological function. During examination, clinicians should attempt to reproduce the patient's UI symptoms and verify test quality upon completion to ensure reasonable interpretation of results.

2. Surgical Treatment Approaches

The main surgical procedure is mid-urethral sling surgery, which involves placing a mesh sling around the mid-urethra through puncture to support the urethra and prevent involuntary urine leakage. Variations include traditional transvaginal tension-free vaginal tape (TVT), transobturator tape (TVT-O), modified transobturator approach (TVT-A), retropubic approach (TVT-E), and single-incision transvaginal sling (TVT-S). All these techniques can improve SUI in elderly female patients. Compared with TVT-O, TVT-E avoids persistent pain caused by transobturator puncture and significantly reduces operative time. TVT-A markedly decreases the incidence and severity of postoperative groin pain. TVT-S involves smaller incisions and faster recovery but carries a risk of increased postoperative thigh pain.

3. Current Status of Nursing Interventions for Elderly Female UI

3.1 Non-Surgical Treatments

Biofeedback and Electrical Stimulation Combined with Pelvic Floor Muscle Training (PFMT): Biofeedback electrical stimulation combined with pelvic floor exercises is currently the primary treatment for SUI, effectively improving maximum flow rate, voiding time, and maximum urethral closure pressure while significantly alleviating urinary distress symptoms. In terms

of improving pelvic floor muscle strength, biofeedback electrical stimulation alone shows no significant difference compared with other pelvic floor exercise interventions. However, when combined with PFMT, treatment efficacy substantially improves, reducing UI's impact on patients' lives and social activities while increasing pelvic floor muscle strength. Pelvic floor muscle training is an effective treatment for female UI, improving both symptoms and psychological well-being. However, since pelvic floor muscles are not visible, most patients struggle to master the technique, and elderly patients often demonstrate suboptimal compliance. Nurses play a crucial role in guiding patients through PFMT, and targeted nursing interventions—including health education, psychological counseling, PFMT guidance, and fluid intake management—can substantially improve UI symptoms.

Combination Therapies with Traditional Chinese Medicine: Building upon biofeedback pelvic floor rehabilitation, combined therapies such as transcutaneous electrical acupoint stimulation, steam heat therapy, and moxibustion can warm meridians, dispel dampness, and ultimately strengthen healthy qi, restore yang, tonify the middle, and regulate qi and blood. These integrated TCM approaches can enhance pelvic floor electromyographic signals in elderly female SUI patients, promote pelvic floor function recovery, reduce urine leakage, and improve quality of life.

Sacral Nerve Stimulation Combined with Medication: Combined sacral nerve stimulation can improve voiding difficulties while reducing medication dosage and associated adverse effects. Sacral nerve stimulation combined with tolterodine effectively improves clinical symptoms of mixed UI in elderly women, achieving a total effective rate of [percentage missing]% with advantages including rapid onset, non-invasiveness, and fewer drug-related side effects.

3.2 Health Education and Psychological Care

During treatment, specialized UI nursing staff should provide education and supervision using videos, illustrated materials, and verbal communication to explain disease causes, treatment methods, expected outcomes, and precautions. Nurses should patiently answer questions, correct misconceptions, and help patients establish proper disease understanding. Scientific management of fluid intake—precisely controlling daily water consumption to meet physiological needs while minimizing voiding's impact on quality of life—is essential. A cross-sectional study showed that elderly female UI patients have high risks of comorbid depression, anxiety, and stress. Due to wearing pads, experiencing body odor, and other issues, these patients often have low self-esteem and psychological resilience, with quality of life at moderate levels. Therefore, nursing staff should select appropriate interventions to enhance psychological resilience, reduce stigma, and alleviate social anxiety. Treatment companionship and nursing guidance help patients master treatment essentials and improve efficiency. Strengthening psychological assessment, protecting patient privacy, and sharing successful cases can help alleviate negative emotions. Developing personalized

psychological nursing plans based on individual patient needs ensures targeted, systematic, and comprehensive care, positively impacting nursing quality and outcomes.

4. Future Perspectives

As internet innovations become deeply integrated into economic and social sectors and artificial intelligence applications become widespread—particularly with mobile network technologies like smartphones and tablets—UI treatment and nursing have entered a new era. Due to limited numbers of specialized UI nurses, interventions limited to outpatient and inpatient settings yield suboptimal results. Home-based UI nursing education models have gained new popularity. Firet et al. designed a home-based internet PFMT e-health system using email reminders, telephone guidance, and remote instruction to achieve home-based nursing education. Wadensten et al. applied a smartphone APP for treatment monitoring and self-management in UI patients, demonstrating superior outcomes compared to traditional management models. Deploying medical resources to community and family levels and leveraging community and family nursing roles can achieve better education and treatment outcomes. Building a comprehensive management platform for elderly female UI patients that integrates community and family nursing represents a primary direction for future nursing research. As patient awareness gradually improves, UI nursing should shift from education-focused approaches to auxiliary treatment through various modalities, constructing a comprehensive management system to achieve better nursing and treatment outcomes.

In summary, elderly female UI is a significant public health issue that can cause long-term physical and psychological harm. Healthcare professionals should enhance awareness of UI among elderly women, implement targeted treatment measures early in clinical practice, provide health education guidance, and attend to patients' psychological well-being to support comprehensive management. Furthermore, applying smart devices and network technologies while leveraging community and family nursing roles to build a comprehensive management platform for elderly female UI patients should be the focus of future nursing research.

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Note: Figure translations are in progress. See original paper for figures.