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Application Value of Bundle Management in Safe Nursing Care for Patients with Autoimmune Encephalitis

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Abstract: *Objective:* To explore the application effect of bundle management in the safe nursing of patients with autoimmune encephalitis. *Methods:* Seventy-five patients with autoimmune encephalitis who met the inclusion criteria in our hospital from January 2024 to June 2024 were randomly divided into two groups: an observation group of 39 patients and a control group of 36 patients. The control group received routine nursing care, while the observation group implemented a bundle management strategy based on routine nursing care. Safety nursing outcomes, clinical symptom improvement time, hospital stay, and neurologic function recovery were observed in both groups. *Results:* The incidence of adverse events in the observation group was 12.82%, significantly lower than the 33.33% in the control group, with a statistically significant difference ($P < 0.05$). There was no statistically significant difference in restraint usage and ICU transfer rates between the two groups ($P > 0.05$). The clinical symptom improvement time, hospital stay, and neurologic function recovery in the observation group were significantly better than those in the control group, with a statistically significant difference ($P < 0.05$). *Conclusion:* Through the bundle management model, effective connections can be ensured in various aspects of treatment and rehabilitation for patients with autoimmune encephalitis, providing patients with comprehensive and multi-level nursing services and improving their overall satisfaction and treatment effectiveness.

Keywords: Bundle management; Autoimmune Encephalitis; Safe nursing; Clinical effect

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1. Introduction

Autoimmune encephalitis is an inflammatory disease of the central nervous system, with main symptoms including consciousness disturbance, epileptic seizures, and intellectual decline. The etiology of autoimmune encephalitis is complex, and its specific cause is currently unclear. However, most scholars believe it is related to genetics, infection, and autoimmunity. In recent years, with the deepening of research on autoimmune encephalitis, the treatment effect has been continuously improved, prognosis has been enhanced, and it has gradually become a

common clinical disease in neurology. The 2018 Chinese Guidelines for the Diagnosis and Treatment of Epileptic Diseases included autoimmune encephalitis in the types of epileptic seizures and proposed strengthening nursing management for patients with autoimmune encephalitis to reduce adverse events and improve patients' quality of life. Therefore, to improve healthcare providers' understanding of this disease and ensure that patients receive safe and effective treatment, this study adopted the nursing model of bundle management to provide patients with comprehensive and full-cycle nursing intervention, aiming to promote their physical and mental health development and improve their quality of life.

2. Materials and methods

2.1. General information

From January 2024 to June 2024, a total of 75 patients with autoimmune encephalitis who met the inclusion criteria were admitted to our hospital. Among them, 39 were in the observation group, including 24 males and 15 females, with an average age of (43.38 ± 10.62) years, average weight of (62.40 ± 8.15) kg, and disease duration ranging from 20 to 95 days. There were 36 patients in the control group, with a male-to-female ratio of 1:1, an average age of (43.8 ± 10.6) years, average weight of (63.4 ± 8.13) kg, and disease duration ranging from 20 to 95 days. There were no statistically significant differences in gender, age, and disease duration between the two groups ($P > 0.05$), making them comparable.

Inclusion criteria were based on the Chinese Expert Consensus on the Diagnosis and Treatment of Autoimmune Encephalitis (2022 Edition), age ≥ 18 years, and signed informed consent by family members or patients [1]. Exclusion criteria included severe cardiac, liver, or renal insufficiency, malignant tumors or immunodeficiency diseases, history of mental illness or cognitive impairment that prevents cooperation with nursing, and withdrawal or death during the study [2].

2.2. Methods

The control group received routine nursing care, including monitoring of vital signs, medication management, basic nursing, immunotherapy (such as glucocorticoids, gamma globulin, etc.) according to doctor's orders, and routine health education.

The observation group implemented a bundle management strategy based on routine nursing care, with specific measures as follows: Establishing a multidisciplinary team including neurology, ICU, rehabilitation, and psychology departments to develop individualized nursing plans; keeping emergency medications (such as diazepam) bedside and monitoring electroencephalograms (EEG); using the fall risk assessment scale (Morse scale), bedrail protection, and 24-hour dedicated care; assessing swallowing function (VFSS or FEES) and providing nasal feeding if necessary; applying intermittent pneumatic compression devices (IPC) combined with early rehabilitation training; adopting non-pharmacological restraints (such as environmental adjustments, psychological counseling), and using sedatives if necessary; implementing the NRS scoring system and a stepwise analgesic plan; initiating rehabilitation training (such as cognitive training and physical function exercises) once the condition stabilizes; and regularly conducting family training to improve home care abilities.

2.3. Observation indicators

The safety nursing outcomes of the two groups were observed, including the incidence of adverse events (such as epileptic seizures, falls, aspiration, DVT, etc.), the utilization rate of restraints (such as physical/pharmacological

restraints), and the ICU transfer rate (the proportion of cases transferred to the ICU due to worsened condition). Additionally, the improvement time of clinical symptoms (days), length of hospital stay (days), and modified Rankin Scale (mRS) scores (to evaluate neurologic function recovery, with a score range of 0–6, where lower scores indicate better prognosis) were also observed.

2.4. Statistical methods

Statistical analysis was performed using SPSS 27.0 software. Measurement data were expressed as mean ± standard deviation (±s), and comparisons between groups were made using the t-test. Count data were expressed as rates (%), and comparisons between groups were made using the chi-square test. A P-value < 0.05 was considered statistically significant.

3. Results

3.1. Comparison of safety nursing outcomes between the two groups

The incidence of adverse events in the observation group was 12.82%, which was significantly lower than the 33.33% in the control group, with a statistically significant difference ($P < 0.05$). There was no statistically significant difference in the utilization rate of restraints and the ICU transfer rate between the two groups ($P > 0.05$), as shown in **Table 1**.

Table 1. Comparison of safety nursing outcomes between two groups of patients[n(%)]

Group	Adverse event rate	Restraint utilization rate	ICU transfer rate
Control group (n=36)	12(33.33)	15(41.67)	8(22.22)
Observation group (n=39)	5(12.82)	9(23.08)	3(7.69)
x^2	4.494	2.973	3.158
P	0.034	> 0.05	> 0.05

3.2. Comparison of clinical symptom improvement time, hospital stay, and neurologic function recovery between the two groups

The clinical symptom improvement time, hospital stay, and neurologic function recovery in the observation group were significantly better than those in the control group, with a statistically significant difference ($P < 0.05$); see **Table 2** for details.

Table 2. Comparison of clinical symptom improvement time, hospital stay, and neurologic function recovery between the two groups ($\bar{x}$±s)

Group	Clinical symptom improvement time (d)	Length of hospital stay (d)	Recovery of neurological function (score)
Control group (n=36)	7.52 ± 2.36	14.85 ± 3.72	3.45 ± 1.28
Observation group (n=39)	5.23 ± 1.87	11.62 ± 2.95	2.16 ± 0.94
t	4.876	5.213	3.942
P	0.000	0.000	0.00

4. Discussion

According to statistics, the global incidence of autoimmune encephalitis is between 1/200,000 and 3/200,000. Among these cases, patients aged 65 and above account for 70%, with males predominating over females. Additionally, studies have indicated that epilepsy, diabetes, chronic obstructive pulmonary disease, and other conditions are risk factors for autoimmune encephalitis [3]. Clinically, patients with autoimmune encephalitis may exhibit varying degrees of consciousness and intellectual impairments, accompanied by symptoms such as headache, vomiting, and epileptic seizures. It is generally believed that the initial onset may primarily manifest as consciousness disturbances, and as the disease progresses, the proportion of symptoms related to nervous system dysfunction gradually increases.

Specifically, some patients may present with focal encephalopathy (e.g., cerebral infarction) or psychomotor disorders (e.g., hemiplegia); a few patients manifest diffuse brain injury (e.g., status epilepticus); and another subset of patients experience peripheral neuropathy (e.g., Raynaud's syndrome, sensory disturbances, numbness, tingling sensations, skin rashes, etc.) [4]. It's worth noting that early-stage autoimmune encephalitis patients are highly susceptible to being misdiagnosed with diseases other than autoimmune encephalitis, leading to delayed treatment. Therefore, careful observation of the clinical manifestations of autoimmune encephalitis patients is crucial for early detection of their unique characteristics [5]. Diagnosing autoimmune encephalitis is challenging due to its early-stage similarity with other neurological diseases.

Currently, diagnosis relies primarily on medical history collection, physical examination, imaging, and laboratory tests. MRI is the most commonly used imaging technique, often revealing bilateral symmetric cerebral atrophy in the cerebral hemispheres. Some patients may also exhibit vascular malformations, intracranial hemorrhages, and calcifications. Laboratory tests include detecting anti-NMDA receptor antibodies, measuring beta-amyloid protein (Aβ) levels, and performing transferrin PET scans to aid in diagnosis. Currently, the primary treatment methods for autoimmune encephalitis include symptomatic treatment, immunosuppression, and neuroprotection.

Clinical research has found that nursing interventions for autoimmune encephalitis patients can significantly improve their quality of life [5]. Firstly, establishing a reasonable health education system allows patients' families to grasp disease knowledge and related nursing skills, reducing patients' mental stress and anxiety levels. Secondly, strengthening communication with patients' families enhances their cooperation. Furthermore, regularly conducting health education lectures encourages patients to actively participate in activities, improves physical fitness, and helps them develop healthy lifestyle habits through tailored dietary plans and guidance [6, 7]. As patients with autoimmune encephalitis often experience severe symptoms such as consciousness disturbances, cognitive decline, and epileptic seizures after onset, they face a high risk of mortality upon admission. To reduce mortality rates, healthcare professionals must be adequately prepared to provide timely and effective treatment. For this specific population, medical professionals should also utilize modern medical technologies such as intracranial pressure monitoring, EEG, blood oxygen saturation measurements, and chest CT scans to assess the patient's condition and adjust nursing plans accordingly, ensuring patient safety.

Bundle management, as a novel management philosophy and model, centers on the patient, establishes a multidisciplinary team, and implements a comprehensive nursing model characterized by integration, systematization, and continuity. Its core lies in integrating resources, breaking down departmental barriers, and facilitating information sharing to enhance nursing quality [8]. In recent years, this management model has been widely applied in clinical settings, yielding positive results and gaining recognition and promotion from the

international nursing community. In China, bundle management represents a patient-centered, systematic nursing management approach aimed at establishing scientific and efficient nursing workflows. This enables nursing staff to complete various nursing tasks more accurately and timely, thereby improving nursing quality and efficiency [9]. Currently, the bundle management model has been widely adopted in clinical nursing practice, achieving remarkable success.

The results of this study indicate that the adoption of a bundle management model in the care of patients with autoimmune encephalitis integrates the entire process from admission to discharge, including patient condition assessment, treatment, rehabilitation training, psychological support, and other aspects. Specifically, first, a comprehensive assessment of the patient is conducted, including neurological symptoms, mental state, vital signs, etc. Simultaneously, the patient's family members are trained to understand the basic knowledge of the disease and preventive measures so as to provide more care and attention to the patient in daily life. Secondly, personalized nursing plans are developed based on the patient's actual condition, including medication, nutritional support, exercise guidance, psychological counseling, and other aspects [10]. Additionally, communication and collaboration between doctors and nurses are strengthened to discuss the best treatment plan and adjust nursing measures promptly. Finally, patients are regularly organized to participate in rehabilitation activities such as Tai Chi and yoga to promote their physical and mental recovery.

Autoimmune encephalitis is a severe and progressive disease characterized by high disability rates, high fatality rates, and high recurrence rates. Therefore, early diagnosis and timely treatment are particularly important, and it is also very necessary to provide full-course nursing and long-term management to patients. In this context, bundle management is applied to the long-term care of patients, enabling them to receive effective and safe nursing. Although the application of bundle management in the long-term care of patients with autoimmune encephalitis has been reported in the literature, a unified nursing model has not yet been established. Based on existing research and years of clinical experience, this study proposes a bundle management model suitable for patients with autoimmune encephalitis in China, including: (1) Strengthening education and raising awareness of the disease among patients and their families; (2) Establishing a three-level linkage mechanism between medical staff, nursing staff, and patients to optimize nursing resource allocation; (3) Emphasizing psychological nursing and paying attention to patients' emotional needs; (4) establishing a multidisciplinary team to standardize treatment plans.

5. Conclusion

In summary, the bundle management model can achieve continuous nursing services for patients from admission to discharge, which is more conducive to improving the overall condition of patients and enhancing their quality of life. Although bundle management has achieved good results in patients with autoimmune encephalitis in our hospital, there are still some issues that need further exploration and improvement, such as how to combine this model with traditional nursing models and make appropriate adjustments based on the different conditions of patients; and how to determine the standards and quantitative indicators of bundle management. In addition, various unpredictable problems may be encountered during implementation, such as insufficient professional knowledge and skills of medical staff, inadequate medical equipment, etc., which can affect the effectiveness of bundle management. Therefore, it is necessary to continuously improve the bundle management system, strengthen nursing staff training, and enhance medical standards to better ensure patient safety.

Disclosure statement

The author declares no conflict of interest.

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