

The Impact of Standardized Emergency Care on Acute Stroke Treatment and Recovery Time

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Abstract: *Objective:* To investigate the clinical benefits derived from the implementation of standardized emergency care for patients experiencing acute strokes. *Methods:* One hundred cases of acute stroke were categorized based on the admission order, with 50 cases per group. The control group received routine emergency care, while the observation group received standardized emergency care. A comparison of the general observation indicators and complication rates of emergency care was conducted. *Results:* The observation group exhibited shorter pre-examination and assessment time, quicker physician reception time, faster emergency green channel treatment time, and reduced door-to-needle time compared to the control group ($P < 0.05$). Moreover, the emergency treatment success rate was higher, and the total number of complications was lower in the observation group than in the control group ($P < 0.05$). *Conclusion:* The implementation of standardized emergency care proves effective in reducing treatment and recovery times for acute stroke patients. It enhances the success rate of emergency treatment and diminishes the risk of associated complications. These findings underscore the significance of promoting standardized emergency care for acute stroke patients.

Keywords: Standardized emergency care; Acute stroke; Treatment time; Recovery time

Online publication: December 18, 2023

1. Introduction

Acute stroke stands as one of the prevalent forms of acute cerebrovascular diseases encountered in emergency departments. It primarily denotes the sudden rupture or blockage of cerebral blood vessels influenced by various internal and external factors, leading to hypoxia-ischemic necrosis of brain tissue^[1]. According to pertinent research data, the 4.5 hours following the onset of a stroke represent the golden window for diagnosis and treatment. Administering effective intravenous thrombolytic treatment within this timeframe significantly restores blood supply to the patient's brain tissue, thereby reducing the risk of cerebral infarction and mitigating the severity of tissue damage.

However, routine emergency nursing processes were excessively intricate. Much of the nursing interventions were executed in adherence to rules and regulations, lacking predictability, planning, and standardization. Consequently, numerous patients experienced delays in receiving optimal treatment. The timing

of treatment plays a pivotal role in determining the final recovery outcome ^[2,3].

Standardized emergency care emerges as an enhanced iteration of routine emergency care. It simplifies unnecessary care processes based on the patient's actual situation while concurrently standardizing the implementation of high-quality predictive care measures. This approach serves to enhance patient care, improve the efficiency of emergency treatment, and contribute to more satisfactory treatment outcomes ^[4]. This study focused on 100 cases diagnosed with acute stroke, delving into the clinical benefits derived from the application of the standardized emergency care model within routine emergency care practices.

2. Materials and methods

2.1. General information

One hundred cases of acute stroke were enrolled, all admitted within the study's specified time frame (commencing in January 2020 and concluding in January 2023). Group processing was standardized based on the patient's admission time, resulting in 50 cases per group.

In the control group, there were 26 males and 24 females, with ages statistically ranging between 55 and 86 years, averaging 70.53 ± 6.19 years. The severity of illness was categorized as follows: 15 mild cases, 20 moderate cases, and 15 severe cases. The distribution of total basic diseases was 18 with hypertension, 16 with diabetes, and 16 with coronary heart disease.

The observation group comprised 24 males and 26 females, with ages ranging from 54 to 85 years, averaging 70.48 ± 6.12 years. The severity of illness in this group was distributed as 16 mild, 22 moderate, and 12 severe, whereas the distribution of total basic diseases was 16 with hypertension, 17 with diabetes, and 17 with coronary heart disease. After a standardized comparison of data between groups, no significant differences were observed ($P > 0.05$).

Inclusion criteria included patients meeting the relevant diagnostic standards outlined in the "Chinese Guidelines for the Prevention and Treatment of Cerebrovascular Disease" ^[5], confirmation of disease through head computed tomography (CT) scan and other examinations, National Institutes of Health Stroke Scale (NIHSS) score exceeding 4 points, with no history of epilepsy, Alzheimer's disease, mental disorder, and psychological disorder, and can express oneself normally, as well as voluntarily sign the informed consent relevant documents.

Exclusion criteria included patients with combined severe dysfunction of vital organs such as heart, lung, and kidney, coexistence with coagulation disorders and immune system diseases, presence of intracranial malignant tumors or severe brain trauma, death occurring midway through the study, and withdrawal from the study before completion.

2.2. Methods

Control group: Routine emergency nursing procedures are systematically executed. Upon admission, patients are guided to register and make payments first. Subsequently, they are triaged to the clinic or emergency room for preliminary assessment, clinical examination, emergency treatment, and other essential processes. Following diagnosis, patients are then transferred to a specialist for comprehensive systemic treatment.

Observation group: The standardized emergency nursing model is implemented based on the care provided to the control group. Specifically:

- (1) Establishment of a "standardized emergency nursing team": This team, led by the head nurse of the emergency department, includes four emergency nurses with over five years of experience and doctors from various departments, such as emergency medicine, surgery, and imaging. Regular training

sessions are conducted to ensure team members are well-versed in the emergency care process, possess a deep understanding of it, and are aware of risk prevention and control.

(2) Execution of standardized emergency care:

- Reception: From receiving the patient's emergency call, relevant personnel are immediately notified to prepare for departure within 5 minutes. Simultaneously, first aid items, instruments, and personnel are prepared based on received patient information.
- Pre-examination and triage: Completed within five minutes of the patient's arrival. The green channel is promptly opened, guiding the patient to the emergency room. The doctor's first-diagnosis responsibility system is enforced, prioritizing examination and preliminary condition assessment. The team leader allocates nursing work based on the "examination first, pay later" principle, ensuring the orderly and safe progression of treatment. Patient data is immediately entered into the information storage system for accessibility by other departments.
- Emergency treatment: Upon entering the rescue room, the intravenous channel is opened, the ECG monitor is connected, and oxygen therapy is administered. A designated individual communicates effectively with family members to gather medical history, allergy information, and other pertinent details for planning follow-up diagnosis and treatment. Relevant examinations are completed in a standardized manner, wristbands of varying grades are promptly applied, and doctors from relevant departments are contacted for symptomatic treatment within 10 minutes.
- Transfer: Accompanied by a dedicated individual, patients are transferred using restraint belts to prevent falling accidents. Real-time tracking of inspection reports is maintained. For patients undergoing intravenous thrombolysis or surgical treatment, effective communication with family members is initiated to clarify the necessity and importance of treatment. Consent forms are signed efficiently, and treatment preparations are completed promptly. Non-surgical patients are prioritized to their wards, where family members are notified to undergo admission procedures. The patient's vital signs are monitored in real-time, with immediate reporting and symptomatic treatment for any abnormalities discovered.

2.3. Observation indicators

General observation indicators of emergency care, including pre-examination and assessment time, physician reception time, emergency green channel treatment time, and the time from consultation to intravenous thrombolytic therapy (also known as the door-to-needle time; DNT), were meticulously recorded for both groups. The observed values were compared, and simultaneously, the emergency treatment success rates of the two groups were calculated and subjected to comparison. Statistical comparisons of complication incidence rates, encompassing respiratory obstruction, neurological sequelae, and cerebral herniation, were conducted between the two groups.

2.4. Statistics

Utilizing SPSS 25.0 for Windows software as the statistical foundation, all obtained data were categorized by nature. For measurement data, it was presented as mean \pm standard deviation (SD), with a parallel *t*-test applied. For count data, it was expressed as %, with a chi-squared test applied. A final *P* value smaller than 0.05 denotes a statistically significant difference.

3. Results

3.1. Comparison of general observation indicators of emergency care between the two groups

As depicted in **Table 1**, the pre-examination and assessment time, physician reception time, emergency green channel treatment time, and DNT time in the observation group were all shorter than those in the control group ($P < 0.05$). Furthermore, the emergency treatment success rate in the observation group surpassed that of the control group ($P < 0.05$).

Table 1. Comparison of observation results of general indicators of emergency care (mean \pm SD, min)

	Pre-examination and assessment time	Physician reception time	Emergency green channel treatment time	DNT	Emergency treatment success rate [n (%)]
Control group (n = 50)	4.62 \pm 2.11	10.98 \pm 4.92	61.54 \pm 18.62	115.25 \pm 28.65	37 (74.00)
Observation group (n = 50)	3.82 \pm 1.84	9.29 \pm 3.11	42.89 \pm 11.56	49.12 \pm 12.05	48 (96.00)
<i>t</i> / χ^2	2.021	2.053	6.017	15.045	9.490
<i>P</i>	0.046	0.043	0.001	0.001	0.002

3.2. Comparison of complication rates between the two groups

Table 2 illustrates that upon observing the total complication rates in both groups, the observation group displayed a rate of 4.00%, significantly lower than the statistically calculated rate of 18.00% in the control group ($P < 0.05$).

Table 2. Comparison of total observed values of complications [n (%)]

	Airway obstruction	Neurological sequelae	Cerebral herniation	Total value
Control group (n = 50)	5 (10.00)	1 (2.00)	3 (6.00)	9 (18.00)
Observation group (n = 50)	1 (2.00)	0 (0.00)	1 (2.00)	2 (4.00)
<i>t</i> / χ^2	-	-	-	5.005
<i>P</i>	-	-	-	0.025

4. Discussion

Acute stroke clinically manifests in two main types: ischemic stroke and hemorrhagic stroke. Ischemic stroke holds a higher incidence, constituting approximately 60%–70% of the total cases [6]. With the acceleration of the country’s aging process in recent years, the prevalence of chronic diseases such as acute stroke, prevalent among middle-aged and elderly individuals, has risen steadily. Characterized by the “four highs” (high incidence, high disability rate, high mortality rate, and high recurrence rate), patients and their families endure significant physical and mental challenges, leading to substantial economic losses for both individuals and society [7].

In-depth clinical research reveals that approximately 1.9 million brain cells die every minute after a stroke. Simultaneously, functional losses occur in areas such as language, movement, and cognition controlled by affected brain tissue. It is widely acknowledged that the longer the interval between the onset of the disease and standardized diagnosis and treatment, the greater the likelihood of lasting sequelae and increased severity. Beyond a certain time limit, this delay can result in a patient’s death. Therefore, in the case of acute stroke,

clinical practice has consistently adhered to the principle of “early diagnosis, early intervention.” The goal is to implement relevant standardized intervention measures in the emergency care process, minimizing the patient’s treatment and recovery time while ensuring a favorable prognosis ^[8-10].

Traditionally, clinical patients with acute stroke often opted for the routine emergency care model, characterized by a set sequence of procedures: registration → registration → payment → medical treatment → preliminary assessment → emergency treatment → triage to a specialist for systematic treatment. While this approach ensures the orderly development of nursing work, it poses obstacles for emergency patients racing against time to receive systemic treatment. Conversely, it can easily lead to a delay in the patient’s optimal treatment opportunity ^[11,12].

Judging from the results in **Tables 1** and **2** in this study, in comparison to the control group, the observation group exhibited a shorter emergency treatment time, a higher emergency treatment success rate, and a total complication rate of only 4.00%. This confirms that the standardized emergency care model boasts more effective application advantages. Analysis of reasons reveals that standardized emergency care places greater emphasis on flexibility and adaptability. The nursing measures prioritize “life rescue,” focusing on care that can stabilize the patient’s condition to the maximum extent and enhance the nursing efficiency of emergency treatment. For instance, responding to an emergency call within 5 minutes, preparing relevant first aid items and equipment, conducting immediate pre-examination triage upon the patient’s arrival at the hospital, and ensuring an orderly transfer after diagnosis, all contribute to a streamlined process without wasting any nursing links. Consequently, this significantly reduces the patient’s unnecessary time expenditure, resulting in a shorter diagnosis and treatment time and ultimately achieving a more satisfactory treatment outcome ^[13-15].

In summary, the implementation of standardized emergency care for acute stroke patients demonstrates a significant reduction in treatment and recovery time, an increased success rate of emergency treatment, and an overall improved prognosis. It is strongly recommended for widespread promotion.

Disclosure statement

The author declares no conflict of interest.

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