Analysis of the effect of comprehensive physical and mental nursing for patients with acute cerebral infarction in intravenous thrombolytic therapy and its influence on quality of life and psychological state

Yun Zhang[#a], Mingxia Wang[#a], Tingting Zhao[a], Jing Zhang[a], Zequn Shen[b*]

Abstract

Background: To study the efficacy of comprehensive physical andmental nursing for patients with acute cerebral infarction (ACI) undergoing intravenous thrombolytic therapy and its impact on patients' quality of life and psychological state. **Methods:** Two hundred patients with ACI enrolled in our hospital between December 2018 and December 2019 were included and equally assigned to the control group and the experimental group by random number table. The control group adopted routine care, and the experimental group received comprehensive physical and mental nursing. The nursing efficacy, nursing satisfaction, quality of life index (QLI) score, mental status scale in non-psychiatric settings (MSSNS) scale, self-rating anxiety scale (SAS), self-rating depression scale (SDS), National Institute of Health Stroke Scale (NIHSS), changes in hemodynamic indicators, and incidence of adverse events during intravenous thrombolysis were compared between the two groups. **Results:** The nursing satisfaction and efficacy were higher in the experimental group than the control group (P<0.05). The experimental group obtained higher QLI scores, and lower scores of MSSNS, SAS, SDS , and and NIHSS in contrast to the control group (P<0.05). The experimental group outperformed the control group with regard to incidence of adverse reactions (P<0.05). **Conclusion:** Comprehensive physical and mental nursing for patients with ACI undergoing intravenous thrombolysis contributes to improving the nursing efficacy and satisfaction, quality of life, and patients' psychological state.

Keywords: Comprehensive physical and mental nursing; Acute cerebral infarction; Intravenous thrombolysis; Quality of life; Mental state; Application effect

Literature Review

Acute cerebral infarction (ACI) is an acute cerebrovascular disease that occurs mostly in middle-aged and elderly people, with a high mortality and recurrence rate, and patients are predisposed to obvious sequelae after treatment (Nam et al., 2020; Ren et al., 2020; B. Zhang, Di, Song, & Li, 2020). The onset of ACI mainly occurs at getting up in the morning or in wake of sitting or resting, with main manifestations such as dyskinesias, language

a. *Emergency ward, Haian Hospital, Nantong University, Jiangsu Province ,17 Zhongba Zhonglu ,226600*
b. *School of nursing, Hangzhou vocational and technical college, 68 xiasha xueyuan street, jianggan district,Hangzhou City, 310018 Zhejiang Province, China.*
#Contributed equally to this work
*Address correspondence to: Zequn Shen. School of nursing, Hangzhou vocational and technical college, 68 xiasha xueyuan street, jianggan district, Hangzhou City, 310018 Zhejiang Province, China.
E-mail: guaxiajiaocibwiuyk@163.com; Tel.:86-13867161865

disorders, and coma. The optimal timing for thrombolytic therapy is within 6 hours after the onset (Tian et al., 2020; Wu, Li, & Sun, 2020; Xie, Zhao, & Li, 2020). Intravenous thrombolysis is the most common and effective treatment for ACI. As intravenous thrombolysis rapidly reduces the platelets in the patient's body to lower the coagulation function, patients may experience decreased blood pressure and bleeding during thrombolysis (Kim, Sohn, & Jung, 2020). In addition, patients with ACI mostly suffer adverse emotions, which may impair treatment efficacy and prolong recovery. Therefore, rigorous and professional nursing, and close monitoring of hemodynamic indicators and hemorrhage for ACI patients receiving intravenous thrombolysis are of great significance to ensure better recovery. Nonetheless, the efficiency of current routine nursing leaves much to be desired as it is insufficient in the amelioration of patients' mental state (Lyu, Xie, Sun,

& Zhang, 2020; Wang, Wang, Guo, Gao, & Yu, 2020).

Introduction

Comprehensive physical and mental nursing centers on the nursing of patients' physical and mental health, which fascilitates eliminating negative emotions and reducing adverse reactions in patients. To investigate the application value of comprehensive physical and mental nursing in intravenous thrombolysis for patients with ACI, this study selected patients with ACI as the research subjects and analyzed the nursing efficiency, nursing satisfaction, hemodynamic indicators. The specific research reports are as follows.

1 Data and Methods
Ethical statement

The study was approved by the Haian Hospital, Nantong University ethics committee, all methods were conducted in accordance with the Declaration of Helsinki, and all patients voluntarily participated in the study with signed informed consent form.

1.1. General Data

Two hundred patients with ACI enrolled in our hospital from December 2018 to December 2019 were identified as research subjects and distributed to the control group and the experimental group using the random number table, with 100 cases in each group. This study used stratified sampling by capturing key population characteristics in the sample, to produce characteristics in the sample that are proportional to the overall population. Patients in the experimental group were aged 36-75 years, and patients in the control group were aged 35-77 years. The two groups had comparable general data (P>0.05). See Table 1.

1.2 Inclusion/Exclusion Criteria
1.2.1 Inclusion Criteria
(1) Met the clinical signs of ACI;
(2) Aged 18- 80 years;
(3) Without drug allergies and drug abuse histories, or bad habits;
(4) Without organic diseases;
(5) The study was approved by the hospital ethics committee, and all patients voluntarily participated in the study with signed informed consent form.

1.2.2 Exclusion Criteria
(1) With an onset time exceeding 6h;
(2) With consciousness disorders that prevented cooperation with the research;
(3) With non-first-time ACI

1.3 Methods

All patients underwent routine physical examination and intravenous thrombolysis after admission. The control group received routine care, including monitoring of vital signs and regular inspection of the oral cavity and skin surface. Bleeding gums or occult blood in the skin were promptly reported to the attending physician. The experimental group adopted comprehensive physical and mental nursing. Corresponding nursing protocols were formulated according to the patients' conditions. Movement disorders required assistance from nursing staff for position changes such as turning, sitting, and lying, and speech disorders required guidance from nursing staff for speech exercises. In the nursing process, nursing staff should pay attention to patients' physical and emotional changes, relieve patients' psychological pressure through light music and positive energy videos, and improve patients' understanding of acute cerebral infarction through health education popularization, to alleviate their fears and maintain a positive state of mind for active treatment.

1.4 Observational indicators

The changes in heart rate, blood pressure, and blood oxygen saturation, and the incidence of adverse reactions in the two groups during intravenous thrombolysis were analyzed.

If the patient had no bleeding, no unconsciousness, and no obvious adverse reactions, and experienced significant mitigation in speech and motor dysfunction, the efficacy of the treatment was considered markedly effective. The efficacy was considered effective if the patient had no bleeding and no obvious adverse reactions, and experienced significant mitigation in speech and motor dysfunction. The treatment efficacy was considered ineffective if the patients had obvious adverse reactions.

The quality of life index (QLI) scoring standard includes 10 items such as daily activities, work and life, interpersonal relationships, and treatment feelings, with a total of 100 points. The score is propotional to quality of life.

The mental status scale in non-psychiatric settings (MSSNS) has 60 points in total, with a score below 60 points representing a normal mental state, 60 -70 points representing a mildly abnormal mental state, and > 70 points representing an abnormal mental state.

The self-rating anxiety scale (SAS) has 50 points in total, with a score below 50 points representing a normal state, 50-59 points representing mild anxiety, 60-69 points representing moderate anxiety, and >

70 points representing severe anxiety.

The self-rating depression scale (SDS) score regards 53 as the reference value, with a score below 53 points representing a normal state, 53-62 points representing mild depression, 63-72 points representing moderate depression, and > 72 points representing severe depression.

The National Institute of Health Stroke Scale (NIHSS) score has 42 points in total. The score is propotional to the severity of neurological deficit, with a score of 0-1 points representing a normal state, 1-4 points representing mild stroke, 5-15 points representing moderate stroke, 16 -20 points representing moderate and severe stroke, and 21-42 points representing severe stroke.

1.5 Statistically analyses

Statistical software SPSS21.0 was used for data analysis. Measurement data were expressed as $(\bar{x} \pm s)$, and processed using the t-test. Count data were expressed as [n(%)] and processed using the chi-square test. P<0.05 indicated a statistically significant difference.

2 Results

2.1 Comparison of the nursing efficacy

The experimental group obtained a higher effective rate than the control group (93% vs. 75%) (P<0.05). See Table 2.

2.2 Comparison of the nursing satisfaction

The experimental group showed a markedly higher nursing satisfaction o than the control group (97% vs. 81%) (P<0.05). See Table 3.

2.3 Comparison of the evaluation indicators

The experimental group was recorded with higher QLI scores, and lower MSSNS scores, SAS scores, SDS scores, and NIHSS scores than the control group (P<0.05). See Figure 1.

2.4 Comparison of hemodynamic indicators

The two groups has similar results of blood pressure, oxygen saturation, and heart rate (P>0.05). See Figure 2.

2.5 Comparison of adverse reactions

Bleeding gum, fecal occult blood, dizziness, and nausea were the adverse reactions in this study. A lower incidence of adverse reactions was witnessed in the experimental group than the control group (8% vs. 19%) (P<0.05). See Table 4.

3. Discussion

Thrombolytic therapy within 6 hours after the onset of ACI effectively improves treatment efficacy and avoids the sequelae of patients with ACI (Abdelsalam et al., 2020; Kawada, 2020; Sabben et al., 2020). However, thrombolytic therapy may cause severe bleeding and even cerebral hemorrhage in case of the loss of the optimal treatment timing of 6 hours (Fujii et al., 2020; Q. Zhang, Yuan, Liu, Li, & Dong, 2020). Intravenous thrombolytic therapy for patients with ACI normally lasts 24 hours, during which the occurrence of bleeding requires timely and effective treatment (Bao, Gao, Pan, Zhao, & Sun, 2021; Wen & Wang, 2020; Yoshida et al., 2020). Given various precautions in intravenous thrombolytic therapy, hospital care plays a key role in this process. The conventional hospital care model is highly specialized in the physiological performance, vital sign changes, and adverse reaction management of patients, but is relatively deficient in the attention and guidance of patients' psychological status (Matsumoto et al., 2020). Comprehensive physical and mental nursing is to strengthen the care of patients' psychological states on the basis of conventional nursing. To probe into the nursing effectiveness of intravenous thrombolysis in ACI patients and the application of comprehensive physical and mental nursing, this study compared the nursing effectiveness and satisfaction of conventional nursing and comprehensive physical and mental nursing in patients with ACI.

Herein, the nursing efficiency and satisfaction of the experimental group exceeded the control group, indicating that comprehensive physical and mental nursing is effective in ameliorating nursing efficiency and nursing satisfaction. The experimental group had higher QLI scores and lower MSSNS scores, SAS scores, SDS scores, and NIHSS scores (P<0.05), suggesting that comprehensive physical and mental nursing can enhance patients' quality of life and psychological state, with a promising effect on enhancing the neurological function. In addition, no great disparity in hemodynamic indicators was found between the two groups, which indicated that the comprehensive nursing model had little effect on the hemodynamic indicators of patients with intravenous thrombolysis. Comprehensive physical and mental nursing can significantly drive down the incidence of adverse reactions in ACI patients (P<0.05). Xiaomei Chen (Chen, 2020) stated that comprehensive nursing reduces the incidence of complications of ACI patients in intravenous thrombolysis, and significantly alleviate patients' neurological deficits, which conforms to the results of this study. The limitation of this study is the absence of a large sample size and long term efficacy investigation, which will be further investigated in future studies to provide more supportive clinical data.

Study Implications

Comprehensive physical and mental nursing effectively reinforces the nursing efficiency and satisfaction of ACI patients in intravenous thrombolysis, enhance the quality of life, mental state, and neurological function, and decrease the occurrence of adverse reactions in patients, which may provide references for the treatment of ACI.

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Table 1. **General Data Comparison($\bar{x}\pm s$)**

Groups	Experimental Group	Control Group	t/X^2	P
Sex(male/female)	59/41	55/45	0.33	0.57
Age	59.30±6.39	60.08±5.99	0.89	0.37
Height(cm)	168.15±11.39	167.68±10.64	0.30	0.76
Weight(kg)	70.38±5.22	71.48±5.01	1.52	0.13
Onset time(h)	3.38±1.08	3.46±1.00	0.55	0.59
hypertension	27	25	0.10	0.75
diabetes	30	29	0.02	0.88
Hyperlipidemia	11	14	0.41	0.52
Smoking history(year)	15.08±2.29	15.37±2.48	0.86	0.39
Drinking history(year)	20.37±3.67	19.66±3.51	1.40	0.16

Table 2. **Comparison of the Nursing Effectiveness Between the Two Groups**

Groups	Markedly effective	effective	ineffective	Total effectiveness rate (%)
Experimental Group	60	33	7	93%
Control Group	24	51	25	75%
X^2				12.05
P				0.001

Table 3. **Comparison of the Nursing Satisfaction Between the Two Groups**

Groups	Very satisfied	Satisfied	Basically satisfied	unsatisfied	Satisfaction rate (%)
Experimental Group	44	21	32	3	97%
Control Group	14	37	30	19	81%
X^2					13.07
P					<0.001

Table 4. **Comparison of the Incidence of Adverse Reactions Between the Two Groups**

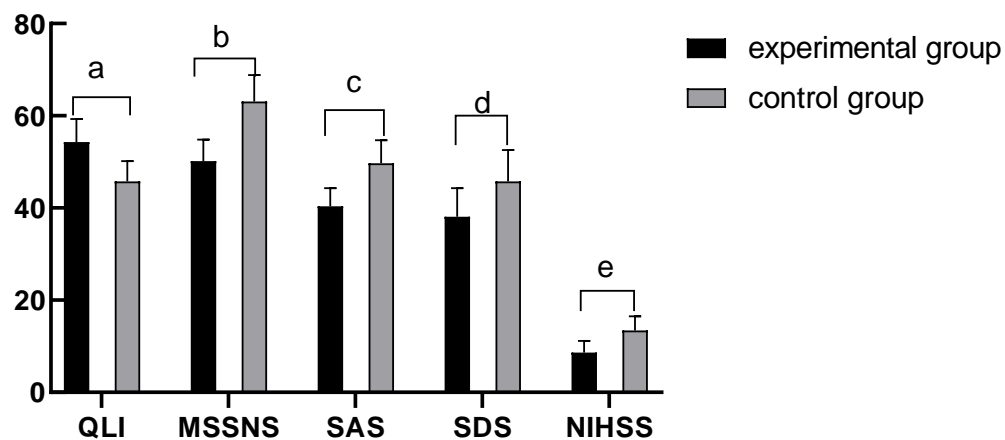| Groups	Gum bleeding	Fecal occult blood	Dizziness	Nausea	Adverse reactions incidence （%）
Experimental Group	1	0	4	3	8%
Control Group	4	3	8	4	19%
X^2					5.18
P					0.02

Figure 1. **Comparison of the Evaluation Indicators Scores Between the Two Groups**
Note: The abscissa represents the QLI quality of life scale, MSSNS mental state assessment scale, SAS, SDS depression and anxiety scale, and NIHSS neurological function score scale in order from left to right in the

experimental group and the control group. The ordinate represents the score of each scale, the unit (point).

In the experimental group, QLI quality of life scale score (54.29±5.02) points, MSSNS mental state assessment scale (50.17±4.69) points, SAS anxiety scale score (40.39±3.88) points, SDS depression scale score (38.09±6.22) points, NIHSS neurological function score (8.61±2.54) points.

The control group QLI quality of life scale score (45.79±4.38) points, MSSNS mental state assessment scale (63.07±5.78) points, SAS anxiety scale score (49.67±5.00) points, SDS depression scale score (45.75±6.84) points, NIHSS neurological function score (13.42±3.08) points.

a represented the comparison of QLI quality of life scores between the two groups, t=12.76, P<0.001;

b represented the comparison of the two groups of MSSNS mental state assessment scales, t=17.33, P<0.001;

c represented the comparison of SAS anxiety scale scores between the two groups, t=14.66, P<0.001;

d represented the comparison of SDS depression scale scores between the two groups, t=8.29, P<0.001;

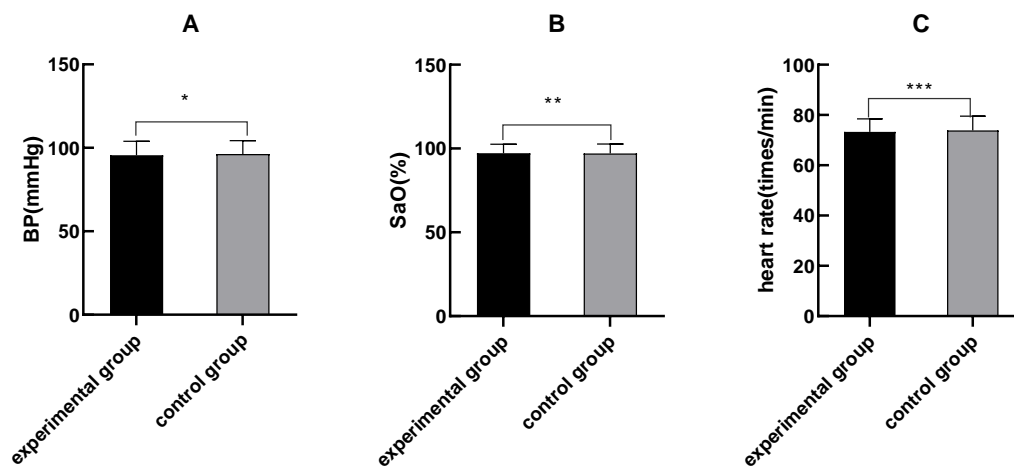e represented the comparison of the two groups of NIHSS neural function scores, t=12.05, P<0.001.

Figure 2. **Comparison of Hemodynamic Indicators Between the Two Groups**

Note: The abscissa of Figure A represented the experimental group and the control group from left to right, and the ordinate represents blood pressure (BP, mmHg).

The abscissa of Figure B represented the experimental group and the control group from left to right, and the ordinate represents the blood oxygen saturation (SaO, %).

The abscissa of Figure C represented the experimental group and the control group from left to right, and the ordinate represents the heart rate (beats/min).

In the experimental group, blood pressure (95.61±8.29) mmHg, blood oxygen saturation (97.24±5.33)%, heart rate (73.28±5.14) beats/min.

In the control group, blood pressure (96.25±8.07) mmHg, blood oxygen saturation (97.08±5.61)%, heart rate (73.86±5.64) beats/min.

* Indicated the comparison of blood pressure between the two groups, t=0.55, P=0.58>0.05;

** indicated the comparison of blood oxygen saturation between the two groups, t=0.21, P=0.84>0.05;

*** indicated the comparison of the heart rate between the two groups, t=0.76, P=0.45>0.05.