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Effect of Emergency Green Channel Optimization on Ischemic Stroke Patients: Impact on Emergency Response Time, Effectiveness, Anxiety, and Acute Stress

ABSTRACT

Objective: The aim was to assess the effectiveness of an optimized emergency green channel in the treatment of acute ischemic stroke (AIS) patients and its effect on emergency response time, effectiveness, anxiety, and acute stress.

Methods: A retrospective analysis was conducted on 349 AIS patients treated with intravenous thrombolysis from January 2019 to May 2022. The patients were divided into those who received optimized emergency green channel treatment (155) and those who did not (194). Propensity score matching (PSM) was used to balance the admission pathways, living conditions, insurance methods, and residential locations of the 2 patient groups. The key metrics comprised the times from onset to admission, admission to computed tomography (CT), CT to thrombolysis, admission to thrombolysis (door-to-needle time (DNT)), National Institute of Health Stroke Scale (NIHSS) scores at various intervals post thrombolysis, heart rate, blood pressure, and scores in Self-Rating Anxiety Scale (SAS) and the Stanford Acute Stress Reaction Questionnaire (SASRQ).

Results: Post PSM, 118 patients were analyzed (54 control and 64 observation). The observation group showed significantly lower time results than the control group, which included the following: the time from onset to admission ($t=31.428$, $P < .001$), door-to-imaging time ($t=27.317$, $P < .001$), imaging-to-needle time ($t=20.951$, $P < .001$, and DNT ($t=25.954$, $P < .001$). Significant differences were observed in 24 hour-post thrombolysis NIHSS scores, heart rate, blood pressure, SAS, and SASRQ scores ($P < .05$) but not in NIHSS scores at 7 and 30 days.

Conclusion: The optimized emergency green channel process effectively reduced the treatment time for ischemic stroke patients, improved rescue efficiency, and positively influenced the psychological stress levels of patients post treatment.

Keywords: Ischemic stroke, DNT, green channel, acute stress, anxiety

Introduction

Acute stroke refers to an acute cerebrovascular disease characterized by the loss of local neurological function; this sickness is dangerous, progresses rapidly, and has a high mortality and disability rate.[1,2] This condition mainly includes ischemic and hemorrhagic cerebral apoplexy, of which the former accounts for approximately 80% of cases.[3,4] Emergency-department thrombolysis is a crucial component of ischemic stroke treatment, and it has achieved remarkable progress in clinical practice. With continuous innovation of thrombolysis techniques, thrombolytic therapy in emergency care has gradually become a standard practice.[5] Intravenous thrombolysis within a certain time window is currently the most effective treatment for ischemic stroke; this method restores normal brain tissue blood supply immediately, saves the ischemic penumbra, and reduces infarct size and disability rate after onset. To improve the efficiency and quality of emergency medical

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care, medical institutions have introduced the optimization process of green channels.[6-8] In this study, the optimization process of emergency green channels refers to the improvement of the green channel within an emergency medical system to effectively address acute events, such as ischemic stroke. This optimization process aims to reduce patient waiting times, expedite diagnostic and treatment processes through improvement of workflows and coordination and provision of prompt medical services to minimize the effects of acute events, such as ischemic stroke. Offering an exclusive emergency green channel to patients with acute ischemic stroke (AIS) and early diagnosis and treatment can effectively shorten the treatment time of each link, reduce the degree of neurological impairment among patients with AIS, and improve their daily life ability.[9] The green channel is aimed at the minimization of patient visit time and improvement of the effectiveness of emergency care through simplification of processes and prioritization of rapid diagnosis and treatment. Door-to-needle time (DNT) refers to the time between a patient's arrival at the hospital and intravenous thrombolysis. However, the current traditional green channel mode for AIS patients fails to achieve control of the DNT within 60 minutes.[10] Moreover, the sudden onset of AIS may trigger a series of negative emotions, such as anxiety, depression, fear, etc., among patients. Such an experience may lead to acute stress disorder, which is a common psychological problem observed in patients with AIS. Such a condition not only affects the quality of life of patients but also increases the risk of recurrence and poor prognosis. Our hospital has adopted an innovative application model of the prehospital and in-hospital collaborative treatment platform based on the high-speed network transmission of all AIS core medical data. As a result, the in-hospital stroke treatment team can initially grasp a patient's condition, formulate emergency plans in advance, seamlessly connect prehospital emergency treatment and in-hospital treatment, and alleviate the patient's acute stress disorder via high-quality and orderly diagnosis and treatment activities. In view of this, this study discusses the means by which emergency green channel optimization saves time, the treatment effect on patients with ischemic stroke, and the influence of stress disorder.

MAIN POINTS

- *The study revealed a substantial decrease in various time metrics, including the time from admission to thrombolysis. Such reduction is a crucial factor in improving the effectiveness of stroke treatment.*
- *The optimized green channel process not only improved rescue efficiency but also positively influenced the psychological stress levels of patients post treatment. This is evident from the significant differences observed in National Institute of Health Stroke Scale (NIHSS) scores, heart rate, blood pressure, and anxiety and stress scores.*
- *Propensity score matching ensured comparability of the groups, which strengthened the validity of results through the reduction of selection bias.*
- *Meticulous comparison of several key metrics, such as the times from onset to admission, NIHSS scores, and physiological indicators, was conducted, and the findings offer a comprehensive understanding of the effect of green channel optimization.*
- *The positive outcomes imply the potential of an optimized emergency green channel process for broader applications in medical settings and possible benefits to a larger population of ischemic stroke patients.*

Material and Methods

Screening and Assignment of Patients

This study involved a retrospective, nonrandomized, single-center analysis. The emergency department of our institution comprises 30 beds, has access to 3 ambulances, and occupies a total area of 2000 m^2. Data were collected from the medical records of patients with AIS who received intravenous thrombolysis in the emergency department of our hospital from January 2019 to May 2022. The patients were divided into the control and observation groups based on whether they underwent emergency green channel optimization. This study received approval from the ethics committee of The Second Affiliated Hospital Of Guizhou Medical University (Approval Number: 2021-Lunshen-21). To reduce selection bias and balance the baseline characteristics of both groups, we applied propensity score matching (PSM) to match the patients based on the following covariates: age, gender, National Institute of Health Stroke Scale (NIHSS) score, hypertension, diabetes, coronary heart disease, hyperlipidemia, history of stroke, atrial fibrillation, antiplatelet drugs, admission route, living condition, insurance mode, and place of residence.

Inclusion Criteria

(1) Head computed tomography (CT) revealed no cerebral hemorrhage and no evident low-density lesions indicating neurological impairment. Acute ischemic stroke was initially diagnosed, and intravenous thrombolysis was performed. (2) The onset time was less than 4.5 hours. (3) A prehospital hospital collaborative treatment platform was used for the treatment, and (4) complete time data was used. (5) Patients or their family members signed informed consent forms and satisfaction questionnaires.

Exclusion Criteria

(1) rt-PA thrombolytic contraindications included the following: (i) severe head trauma or cerebral infarction within the last 3 months; (ii) suspected subarachnoid hemorrhage or seizure; (iii) difficulty in achieving compression hemostasis of the artery puncture at the site in the last 7 days; (iv) previous history of intracranial hemorrhage; (v) intracranial tumors, arteriovenous malformations, or aneurysms; (vi) recent intracranial or spinal canal surgery; (vii) high blood pressure, with systolic pressure $\geq$180 mmHg or diastolic pressure $\geq$100 mmHg; (viii) recent severe internal bleeding or acute bleeding tendency, platelet count less than 100×10^9/L; (ix) currently taking thrombin inhibitors or have taken oral anticoagulants; (2) recurrent transient ischemic attacks without signs; (3) patients with self-admission and in-hospital stroke; (4) patients with consciousness disorder and no cognitive ability.

Emergency Channel Process

Control Group

Upon receipt of a prehospital 120 emergency call, the pre-examination desk personnel prepares to receive the patient. After initial triage, if the patient is suspected of having AIS, the emergency neurologist is promptly notified. The neurologist then arrives on time to

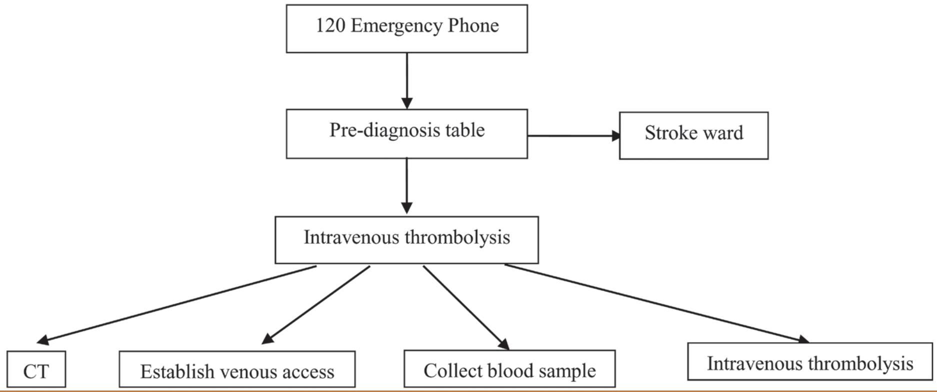

Figure 1. Flowchart. CT, computed tomography.

assess the severity of the patient's AIS and determine whether the patient should be admitted to the stroke ward or directed to the green channel for thrombolytic therapy. Based on their condition and imaging studies, a patient who meets the criteria for intravenous thrombolysis will be approved by the physician for the green channel. The physician will accompany the patient for a CT scan, measure vital signs, establish venous access, and collect blood samples, followed by rapid intravenous thrombolysis (Figure 1). Patients who are unsuitable for thrombolytic therapy will be admitted to the stroke ward for appropriate management.

Observation Group

Prehospital Mobile Emergency Rescue System: Equipped with an ambulance that can transmit information remotely, the stroke treatment team can determine the patient's status in real time and monitor and guide the rescue process provided by the emergency vehicle at the hospital. In addition, a mobile terminal records a patient's medical history, contact information, and other relevant information. Moreover, the patient can wear a smart bracelet and be automatically sent to the hospital stroke treatment quality-control system. The complete green channel process involves virtual account registration, condition assessment, and doctor's orders.

In-Hospital Stroke Treatment Quality-Control System: The in-hospital stroke treatment quality control system can be shared with the prehospital mobile emergency rescue system. Doctors and nurses can use a tablet computer to establish a green-channel virtual account for patients. Thus, doctors can receive patients in the first time. This quality-control system comes with a preset medical order package, a green channel nursing record template, and a medical sharing information interface. Specialists are provided with advance access to patient information. Moreover, the system can record the start and end time nodes of the whole process, such as patient history collection, condition assessment, blood collection, medical examination, and real-time implementation of key treatment technologies, and generate green channel markers simultaneously during inspection and prescription, which is convenient for priority treatment. To avoid human interference, the system establishes a seamless connection with the hospital laboratory information management system and image PACS system to create a proprietary timeline of the entire stroke treatment process and provide an accurate scientific basis for the continuous improvement of green channel treatment of AIS patients.

Observation Indicators

Baseline Indicators: Baseline data considered in this work included patient gender, age, education, marital status, smoking history, hypertension, coronary heart disease, diabetes, hyperlipidemia, stroke history, atrial fibrillation, antiplatelet, and preintervention NIHSS score.

Time Required for Each Link: The 2 groups were compared in terms of their door-to-imaging time, imaging-to-needle time, onset-to-door time, and DNT. Emergency green channel optimization process for the observation group involved the tracking and real-time recording of time points of each link. For the control group, a self-made treatment-process record table was used for manual recording.

Neurological Function: The NIHSS[11] mainly evaluates the degree of neurological impairment of patients; the scale comprises 15 items, such as pupillary reflex, sensory function, and plantar reflex. The scoring criteria are as follows: 0-1, normal or near normal condition; 2-4, mild stroke; 5-15, moderate stroke; 15-20, moderate-to-severe stroke; 21-42, severe stroke.[10] The scale was measured at 24 hours after thrombolysis, on day 7, and on day 90.

Physiological Indicators: Comparison was conducted on the changes in physiological indexes, including the heart rate and systolic and diastolic blood pressures, between the 2 groups. Recording of physiological parameters was conducted before admission and during thrombolysis.

Anxiety Status: Self-Rating Anxiety Scale (SAS)[12] was used to evaluate the psychological status of patients, with 20 items used for each; the maximum total score was 100 points. The higher the score, the more serious the negative emotions of patients. Self-Rating Anxiety Scale was administered 24 hours after thrombolysis.

Acute Stress Disorder Level: The Stanford Acute Stress Reaction Questionnaire (SASRQ) was administered to evaluate the level of acute stress disorder among patients.[13] The common SASRQ tools for acute stress disorder comprise 5 dimensions, namely, vigilance (6 items), dissociation (10 items), avoidance (6 items), reliving (6 items), and social function impairment (2 items), with a total of 30 items, with results ranging from "never experience" to "always experience". The total score was 0-5. The higher the total score, the more severe the acute stress disorder. Points ≥40 indicate a moderate possibility of acute stress disorder, and points ≥57 indicate a high possibility of acute stress disorder.

Sample Size Calculation: The SAS was the main outcome index of this research, and the sample size was calculated using 2 groups of retrospective cohort study. According to the pretest results, the SAS scores of the control and observation groups were 35.51 and 32.66, respectively, with a standard deviation of 3.67, α level of 0.05, efficacy of 0.9, and bilateral test. The minimum sample size (34 cases) for each group was calculated using Statistical Package for the Social Sciences (SPSS) version 15.0 (SPSS Inc.; Chicago, IL, USA) software. In consideration of the loss of follow-up rate of no more than 10%, the final sample size was 39 cases for each group.

Statistical Analysis

Retrospective cohort studies describe PSM as a statistical method that limits treatment selection bias during estimation of causal treatment effects. The following covariates were assessed in our model: admission route, living condition, insurance mode, and place of residence. These parameters were used as a basis to apply one-to-one nearest neighbor matching using logistic regression-based propensity scores, which matched patients in the Enhanced Recovery After Surgery (ERAS) and conventional groups. Two researchers collected data independently, and Statistical Package for the Social Sciences (SPSS) version 26.0 software (IBM SPSS Corp.; Armonk, NY, USA) was used for statistical analysis. The durations of the 3 study stages were expressed as the mean (SD). The 2 groups were compared in terms of the time from onset to admission, time from admission to imaging, and time from imaging to thrombolysis. Comparisons were also conducted on anxiety and stress disorder scores between the 2 groups to assess the green channel availability. Independent samples *t*-tests were conducted for the comparison of the independent means of the 2 groups, where data presented a normal distribution. χ^2 test was performed for the comparison between optimization and the percentage of relevant variables in the optimization group. National Institute of Health Stroke Scale scores of the 2 groups were subjected to repeated measures analysis of variance.

Results

Baseline Data

This study enrolled 349 patients, which were divided into the observation (155) and control (194) groups. Before PSM, the 2 groups exhibited significant differences in terms of their admission route, living condition, insurance mode, and place of residence ($P < .001$). After PSM, 118 well-balanced patients were compared, and no statistical differences were observed in the 4 measures ($P > .05$).

No significant differences were recorded in the preoperative data between the 2 groups after PSM ($P > .05$) (Table 1).

Comparison of the Time Required for Each Link of Treatment Between the 2 Groups

Compared with the control group, the observation group presented significantly shorter times from onset to admission, from admission to CT diagnosis, from CT diagnosis to thrombolysis, and DNT, with statistical significance at $P < .05$ (Table 2).

Comparison of National Institute of Health Stroke Scale Scores After Thrombolysis Between the 2 Groups

Repeated measures analysis of variance revealed a significant main effect for the 2 groups ($F = 5.066$, $P = .026$), a significant main effect for the measurement period ($F = 49.376$, $P < .001$), and a significant interaction effect between the measurement period and the groups ($F = 7.508$, $P = .001$) (Table 3).

Post hoc tests for the group main effect revealed a significant simple group effect at 24 hours ($F = 16.308$, $P < .01$). At 7 and 30 days, nonsignificant simple group effects were observed ($F = 0.152$, $P = .697$; $F = 0.31$, $P = .579$, respectively). Post hoc tests for the measurement period for the main effect indicated a significant simple effect for the measurement period in the control group ($F = 33.798$, $P < .001$). In addition, the observation group exhibited a significant simple effect for measurement time ($F = 8.254$, $P < .001$). Multiple comparisons revealed the significantly higher NIHSS scores of the control group at 24 hours than at 7 and 30 days ($P < .001$), with no significant difference between the 2 latter periods ($P = 1.000$). The observation group achieved significantly higher NIHSS scores at 24 hours than at 7 ($P < .001$) and 30 days ($P = .003$), with no significant difference between the 2 latter periods ($P = 1.000$).

Comparison of Physiological Indexes Between the 2 Groups

The observation group presented lower systolic blood pressure, diastolic blood pressure, and heart rate than the control group. In addition, their SAS and stress scores were lower in all dimensions, and the differences were statistically significant ($P < .05$) (Table 4).

Comparison of Anxiety and Acute Stress Response Between the 2 Groups

The observation group exhibited lower SAS and acute stress scores than the control group, and the differences were statistically significant ($P < .05$) (Table 5).

Discussion and Conclusion

AIS exhibits rapid progress and acute onset, and it causes irreversible damage to the brain tissue of patients within a short period, which results in high mortality and disability rate.[4] Early opening of occlusion is the key to the treatment of AIS, and vascular recanalization in the acute phase, including endovascular intervention and intravenous thrombolysis, is the most important AIS treatment method.[14-16] Time delay, including in-hospital and prehospital delays, is an important reason for most patients with AIS to miss out on the period of intravenous thrombolysis.[17] Door-to-needle time during intravenous thrombolytic therapy in patients with AIS is critical and determines their prognosis.[18] In developed countries, delays to hospital admission can be reduced to 20 minutes. Nonetheless, DTN can be controlled and reduced to 60 minutes in the Chinese healthcare system.[19-21] As a result, an increasing number of medical and health institutions improve the treatment effect on patients with AIS, reduce the delay time, set up a stroke team, and enhance the treatment of patients including the green channel of innovation and improvement.[22,23] Relevant measures have been put forward for the innovation of the green channel for AIS in our hospital, and good application effects have been achieved.

The results of this study show the significantly lower NIHSS score of the observation group than the control group. The observation group also achieved a significantly lower DNT, which conformed to the standard period. This finding proves that the innovative green channel process in the emergency department reduced DNT and thereby improved the effect of thrombolytic therapy and shortened

Table 1. Comparison of Baseline Data

Variable	Control Group (n = 194)	Observation Group (n = 155)	t/χ^2	P	Control Group (n = 54)	Observation Group (n = 64)	t/χ^2	P
Age (years)	73.37 (10.96)	71.54 (14.23)	$t = 1.314$	.196	71.97 (11.18)	71.46 (14.60)	$t = 0.212$	.832
NIHSS	12.28 (1.97)	12.35 (1.93)	$t = -0.333$	.739	12.22 (2.04)	12.25 (2.06)	$t = -0.090$	.929
Gender			$\chi^2 = 0.052$	.827			$\chi^2 = 0.318$	.573
Female	105 (54.12)	82 (52.90)			34 (57.63)	37 (62.71)		
Male	89 (45.88)	73 (47.10)			25 (42.37)	22 (37.29)		
Educational level			$\chi^2 = 0.217$	.897			$\chi^2 = 2.590$	.274
Elementary school and below	69 (35.57)	53 (34.19)			18 (30.51)	21 (35.59)		
Middle school	63 (32.47)	54 (34.84)			22 (37.29)	14 (23.73)		
College and above	62 (31.96)	48 (30.97)			19 (32.20)	24 (40.68)		
Marital status			$\chi^2 = 0.108$	.742			$\chi^2 = 0.179$	.672
Married	48 (24.74)	36 (23.23)			14 (23.73)	16 (27.12)		
Divorced/widowed/unmarried	146 (75.26)	119 (76.77)			45 (76.27)	43 (72.88)		
Smoking history			$\chi^2 = 0.895$	.344			$\chi^2 = 2.175$	.140
No	100 (51.55)	72 (46.45)			32 (54.24)	24 (40.68)		
Yes	94 (48.45)	83 (53.55)			27 (45.76)	35 (59.32)		
Hypertension			$\chi^2 = 2.251$	.133			$\chi^2 = 7.103$	.008
No	82 (42.27)	78 (50.32)			15 (25.42)	29 (49.15)		
Yes	112 (57.73)	77 (49.68)			44 (74.58)	30 (50.85)		
Coronary heart disease			$\chi^2 = 1.426$	.232			$\chi^2 = 0.145$	.703
No	126 (64.95)	91 (58.71)			36 (61.02)	38 (64.41)		
Yes	68 (35.05)	64 (41.29)			23 (38.98)	21 (35.59)		
Diabetes			$\chi^2 = 1.534$	.215			$\chi^2 = 2.746$	.098
No	113 (58.25)	80 (51.61)			34 (57.63)	25 (42.37)		
Yes	81 (41.75)	75 (48.39)			25 (42.37)	34 (57.63)		
Hyperlipemia			$\chi^2 = 0.004$	.949			$\chi^2 = 2.221$	.136
No	117 (60.31)	94 (60.65)			30 (50.85)	38 (64.41)		
Yes	77 (39.69)	61 (39.35)			29 (49.15)	21 (35.59)		
History of stroke			$\chi^2 = 2.558$	.113			$\chi^2 = 1.748$	.186
No	180 (92.78)	136 (87.74)			56 (94.92)	52 (88.14)		
Yes	14 (7.22)	19 (12.26)			3 (5.08)	7 (11.86)		
Atrial fibrillation			$\chi^2 = 0.009$	.926			$\chi^2 = 1.397$	.237
No	128 (65.98)	103 (66.45)			43 (72.88)	37 (62.71)		
Yes	66 (34.02)	52 (33.55)			16 (27.12)	22 (37.29)		
Antiplatelet drugs			$\chi^2 = 1.577$	.209			$\chi^2 = 0.345$	.557
No	132 (68.04)	115 (74.19)			38 (64.41)	41 (69.49)		
Yes	62 (31.96)	40 (25.81)			21 (35.59)	18 (30.51)		
Admission route			$\chi^2 = 84.347$	<.001			$\chi^2 = 0.000$	1.000
Ambulance	22 (11.34)	89 (57.42)			19 (32.20)	19 (32.20)		
Self-admission	172 (88.66)	66 (42.58)			40 (67.80)	40 (67.80)		
Living condition			$\chi^2 = 5.788$	.016			$\chi^2 = 0.000$	1.000
Live with family members	151 (77.84)	136 (87.74)			40 (67.80)	40 (67.80)		
Live alone	43 (22.16)	19 (12.26)			19 (32.20)	19 (32.20)		
Insurance mode			$\chi^2 = 138.399$	<.001			$\chi^2 = 0.000$	1.000
Have health insurance	160 (82.47)	30 (19.35)			30 (50.85)	30 (50.85)		
Without health insurance	34 (17.53)	125 (80.65)			29 (49.15)	29 (49.15)		
Place of residence			$\chi^2 = 90.876$	<.001			$\chi^2 = 0.000$	1.000
Village	147 (75.77)	38 (24.52)			30 (50.85)	30 (50.85)		
Towns	47 (24.23)	117 (75.48)			29 (49.15)	29 (49.15)		

NIHSS, National Institute of Health stroke scale.

the recovery process of patients. Such result was observed innovation of the green channel in radiology, clinical laboratory, and the emergency department led to the establishment of a green channel flow, with coordination from various departments. As a result, patients receive professional treatment, which reduces queuing delay and registration period and shortens the DNT.

Table 2. Comparison of Time Required for Each Link of Treatment Between the Two Groups

Variable	Control Group (n = 54)	Observation Group (n = 64)	*t*	*P*
ODT (min)	130.11 (3.89)	88.22 (9.79)	31.428	<.001
DIT (min)	36.98 (3.07)	22.98 (2.50)	27.317	<.001
INT (min)	31.00 (2.51)	21.83 (2.24)	20.951	<.001
DNT (min)	62.98 (4.23)	44.81 (3.19)	25.954	<.001

DIT, door-to-imaging time; DNT, door-to-needle time; INT, imaging-to-needle time; ODT, onset-to-door time.

Table 3. Results of Repeated-Measures Analysis of Variance for Emergency Green Channel Optimization for National Institute of Health Stroke Scale Scores

				Repeated Measures ANOVA	
Variable	NIHSS_24h	NIHSS_7d	NIHSS_30d	*F*	*P*
Control group (n = 54)	8.20 (1.66)	6.07 (1.45)	5.87 (1.35)	–	–
Observation group (n = 64)	6.98 (1.61)	5.97 (1.47)	6.02 (1.46)	–	–
Group main effect	–	–	–	5.066	.026
Time main effect	–	–	–	49.376	<.001
Group*time	–	–	–	7.508	.001

ANOVA, analysis of variance; NIHSS, National Institute of Health Stroke Scale.

In addition, the anxiety score of ischemic stroke patients in the observation group was lower than that in the control group, which indicates that the optimized process of the emergency green channel can alleviate the anxiety of patients. Self-Rating Anxiety Scale was selected as the primary outcome measure given its crucial role in the stress response. Uğur K[24] revealed that individuals with high anxiety may face an increased risk of post-traumatic stress disorder (PTSD). Stowman et al[25] observed that anxiety emotions mediate acute stress disorder symptoms and subsequent PTSD symptoms. Causal analysis yielded the following: The optimized emergency treatment and nursing process can involve the recording of basic information of patients through prehospital emergency care, monitoring a patient's electrocardiogram and other vital signs, timely reporting to the doctor, easing a patient's tension, advising family members not to panic, comprehending a patient's stress source, implementing effective psychological intervention, and working hard and exerting efforts for a patient's health education and psychological support. In addition, improvement of the emergency care process strengthens the service provided to patients. Patients and their families are advised to avoid emotional excitement, and their fear and other measures are appeased. Optimization of the emergency treatment process for the establishment of a green channel strengthens the scheduling of personnel, further shortens the patient's first-aid period, and stabilizes the patient's mood.

Table 4. Comparison of Physiological Indexes Before and After Treatment Between the 2 Groups

Variable	Control Group (n = 54)	Observation Group (n = 64)	*t*	*P*
SBP_ pre (mmHg)	134.70 (3.10)	135.30 (3.04)	−1.047	.297
SBP_ post (mmHg)	132.48 (4.43)	126.72 (4.69)	6.822	<.001
DBP_ pre (mmHg)	96.33 (2.89)	95.94 (3.38)	0.677	.500
DBP_ post (mmHg)	93.54 (4.70)	90.62 (4.31)	3.507	<.001
HR_ pre (bpm)	110.35 (3.45)	110.42 (3.22)	−0.114	.910
HR_ post (bpm)	105.00 (4.24)	101.25 (3.99)	4.942	<.001

DBP, diastolic blood pressure; HR, heart rate; SBP, systolic blood pressure.

Table 5. Comparison of Anxiety and Acute Stress Response Between the 2 Groups

Variable	Control Group (n = 54)	Observation Group (n = 64)	*t*	*P*
SAS score[a]	35.69 (3.25)	32.02 (3.70)	5.671	<.001
Avoidance	18.00 (3.19)	16.73 (3.60)	2.004	.047
Reexperiencing of trauma	19.13 (4.14)	16.89 (2.89)	3.343	.001
Dissociation	35.24 (7.70)	27.05 (9.12)	5.291	<.001
Anxiety and hyperarousal	16.52 (5.16)	12.38 (2.65)	5.341	<.001
Impairment in functioning	5.57 (1.54)	4.80 (1.89)	2.465	.015
SASRQ score[b]	94.46 (12.41)	77.84 (10.34)	7.936	<.001

SAS, Self-Rating Anxiety Scale; SASRQ, The Stanford Acute Stress Reaction Questionnaire.

After intervention, the observation group showed significantly lower physiological indexes and stress status than the control group, which suggests that the optimized process of the emergency green channel can reduce the stress level of patients. Relevant research reveals that[23,26] a patient's stress response can cause an increase in body heart rate and water and sodium retention, which affect the quality of surgical treatment of patients. Thus, intervention of the stressors is necessary. In addition, the emergency green channel optimization process can improve nurses' subjective initiative toward prehospital emergency treatment. Optimized psychological intervention and emergency treatment processes can effectively calm a patient's nerves, intervene with the source of tension, improve patient circulation, reduce blood vessel tone, and decrease the blood pressure, heart rate, and stress levels in patients with stable vital signs.

Availability of Data and Materials: The datasets used and/or analyzed during the current study available from the corresponding author on reasonable request.

Ethics Committee Approval: This study received approval from the ethics committee of The Second Affiliated Hospital Of Guizhou Medical University. (Approval Number: 2021-Lunshen-21).

Informed Consent: Informed consent was obtained from the patients who agreed to take part in the study.

Peer-review: Externally peer-reviewed.

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Processing – H.Y.; Analysis and/or Interpretation – H.Y., J.Z.; Literature Search – H.Y., J.Z.; Writing – H.Y., J.Z.; Critical Review – J.Z., Q.W.

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