ORIGINAL RESEARCH

Application Effect Evaluation of Optimizing Emergency Nursing Process Before Emergency Coronary Intervention in Patients with AMI and Hypertension

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ABSTRACT

Objective • The study aimed to assess the impact of optimizing the emergency nursing process on certain outcomes in AMI patients with hypertension undergoing coronary intervention therapy.

Methods • This is a retrospective cohort study, a total of 90 patients with AMI complicated with hypertension admitted from October 2020 to March 2022 to observe the effect and safety of two different nursing methods in patients with AMI complicated with hypertension. According to the different nursing process, the subjects were divided into the optimization and conventional groups, with 45 cases in each group. Then, the rescue efficiency, success rate, recurrence rate, re-PCI rate, negative emotions, and adverse reactions of the two groups were observed.

Results • The results showed that the first aid time (39.23±6.28 vs 49.78±9.14), PCI time (45.13±8.60 vs 60.40±8.16) and ECG time (4.18±0.69 vs 6.87±1.00), success rate (93.33% vs 66.67%) and recurrence rate (8.89% vs 22.22%) of the study subjects undergoing the optimized emergency nursing process were significantly better than those undergoing the general emergency nursing process ($P < .05$), and their negative emotions (7.51±1.77 vs 14.07±1.93) and adverse reactions (3 vs 9) were significantly lower than those of the conventional group ($P < .05$).

Conclusions • It is suggested that optimizing the emergency nursing process before PCI for patients with AMI complicated with hypertension positively impacts the clinical efficacy and prognosis. Optimizing the emergency nursing process may potential benefits for patient health, healthcare resource utilization, or the quality of care, which should be consider in clinical practice. (*Altern Ther Health Med.* 2024;30(1):339-343).

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INTRODUCTION

Acute myocardial infarction (AMI) is one of the common clinical critical diseases, with rapid onset and progression and high mortality, which seriously affects the physical and mental health of patients and brings great pressure to their families.[1,2] In recent years, AMI is often accompanied by various diseases, among which hypertension is the most common. In China, 54% of hypertensive patients died from ischemic heart disease in 2017. Hypertension is a common cardiovascular disease with a high mortality and disability rate.[3,4] Percutaneous coronary intervention (PCI) is a common clinical intervention for this disease. This treatment mainly promotes myocardial blood perfusion by dredging the occluded coronary lumen to control the development of the patient's condition and promote the recovery of the patient. Therefore, early PCI is the key to saving AMI patients' lives with hypertension.[5,6] It has been reported in the literature that the optimization of the nursing process before PCI can further shorten the diagnosis time, enable patients to perform surgical intervention as early as possible, and play a positive role in improving the prognosis of patients.[7]

The optimized emergency nursing process reduces myocardial ischemia time and injury degree by reducing revascularization time, improving patient prognosis. The benefits of optimized emergency care for patients with AMI include: rapid assessment and diagnosis, early interventional therapy, rapid pain relief, intensive monitoring and treatment, education and rehabilitation. Optimized emergency nursing processes can provide better care and treatment outcomes for patients with AMI through rapid assessment and diagnosis, early interventional therapy, rapid pain relief, intensive monitoring and treatment, and education and rehabilitation mechanisms. There is a lack of analysis on the efficacy of optimized emergency nursing process in the clinical treatment of AMI patients with hypertension.

Based on this, this study was a retrospective analysis of AMI patients with hypertension in our hospital, with the aim of exploring the application effect of optimizing the emergency nursing process before coronary intervention therapy in AMI patients with hypertension.

PATIENTS AND METHODS

Baseline Data

This is a retrospective cohort study, a total of 90 AMI patients complicated with hypertension admitted to our hospital from October 2020 to March 2022 were continuously included, and they were divided into optimization group (received optimized the emergency nursing process, n = 45) and conventional group (received general emergency nursing process, n = 45) according to different nursing intervention methods. The two groups had no significant difference in baseline data, with certain comparability ($P > .05$). Inclusion criteria: (1) Meeting the diagnostic criteria for AMI[8]: patients with symptoms of cardiac ischaemia, a troponin concentration above the 99th percentile, new electrocardiographic evidence of ST-segment elevation or left bundle branch block, pathological Q-wave appeared in the electrocardiogram, or angiographic evidence of coronary artery occlusion; (2) Onset and admission time < 12 hours due to emergency process; (3) ECG showed ≥2 ST-segment elevations > 0.1 mV; (4) Normal mental state, high treatment compliance; (5) Patient was diagnosed with hypertension: systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg at rest or previously diagnosed as hypertension in antihypertensive therapy; (6) No missing data, informed of the study, and signed the consent form. Exclusion criteria: (1) Complicated with other cardiovascular and cerebrovascular diseases, such as heart failure or stroke; (2) Severe damage of liver and kidney function; (3) Accompanied by other malignant tumors; (4) Pseudohypertension; (5) Unable to participate in the whole study. The ethics committee of Zhejiang Hospital approved this study. Signed written informed consents were obtained from all participants or family members before the study.

Methods

The routine group received general emergency nursing process, established venous access and oxygen inhalation for patients according to the doctor's advice, strictly observed the patients' electrocardiogram by bedside electrocardiogram, completed blood drawing and related examinations, and carried out symptomatic treatment. After admission procedures, preoperative preparation to help patients complete the operation.

The patients in the optimization group were optimized the emergency nursing process based on the routine group, and the specific contents were as follows: (1) The emergency-related team was established, the responsibilities within the team were reasonably allocated, and training was organized regularly for the team members. (2) Out-of-hospital rescue and transfer: The visit time should not exceed 5 minutes after receiving the emergency call. During the visit, relevant first-aid drugs and equipment should be prepared. During the visit, we should keep communication with the on-site staff to help them carry out simple first-aid. First aid and oxygen inhalation were performed immediately upon arrival, and the patients' vital signs were strictly monitored. At the same time, the psychological tension of the patients was calmed to prepare for transport. During the transport period, the patient's condition was judged on a basic basis, and at the same time, the emergency department of the hospital was contacted in time to inform the patient of the condition in detail. (3) Medical treatment: Patients, after admission, through the green channel, are immediately sent to the intensive care and invite relevant department consultation. send a special head to help families deal with relevant formalities, the rest of the nursing staff assist during the doctor rescue, to rapid assessment of patients' ideology, detailed record patients' symptoms, past medical history and the history of allergies, venous passage within 3 min, blood specimens sent to the clinical laboratory, the 18-lead ECG was established within 18 minutes after admission, and the patient was continuously monitored by electrocardiogram and oxygen inhalation. (4) Treatment: Patients diagnosed told patients the right medication (aspirin and clopidogrel, etc.), iodine allergy experiments, strict tests on vital signs in the patients, ease patients' bad emotions at the same time, strengthen the patients' treatment adherence, specifically for families of patients with the diagnosis and treatment, head of the explanation, after family members agree to transshipment, if the abnormal situation to be on-site emergency treatment.

Observation Indicators

The rescue efficiency, treatment success rate, disease recurrence rate, re-PCI rate, negative emotion score, and adverse reactions of the two groups were observed. The rescue efficiency means the length of time when receive medical treatment, included first aid time (time from onset to anticoagulant therapy), PCI time (time from onset to PCI), and ECG time (time from onset to ECG). Negative emotions were assessed by Hamilton Depression Scale (HAMD)[9] and Hamilton Anxiety Scale (HAMA),[10,] and the higher the score, the more serious the negative emotions of the subjects. To test the effect of optimizing the emergency nursing process on short-term prognosis, the participants were followed up for 2 months to observe the occurrence of adverse reactions.

Statistical analysis

Data were processed by Statistic Package for Social Science (SPSS) 26.0 (IBM, Armonk, NY, USA), measurement data were expressed as ($\bar{x} \pm s$), independent samples t test for data between groups, and F-test for data between multiple groups. Count data were expressed as (%), χ^2 test; Repeated measurement ANOVA, analyzed data of each time period between groups and spherical test was performed. $P < 0.05$ was used to indicate statistical significance.

RESULTS

Baseline Data

The ages were 61.69±6.23 and 61.67±5.65 in the optimize and conventional groups, respectively. The proportions of males were 51.11% and 55.56% in the optimize and conventional groups, respectively. The time from onset to admission were 2.67±0.69 and 2.68±0.65 in the optimize group and conventional group, respectively. The proportions of family history were 37.78% and 33.33% in the optimized group and conventional group, respectively. There were no significant differences in age, gender, time from onset to admission, and family history between the two groups ($P > .05$). Table 1.

Rescue efficiency

The optimization group's first aid time, PCI time and ECG time were 39.23±6.28 min, 45.13±8.60 min, 4.18±0.69 min, respectively. The conventional group was 49.78±9.14 min, 60.40±8.16 min, 6.87±1.00 min, respectively. The optimization group's first aid time, PCI time and ECG time were earlier than the conventional group's (both $P < .05$). Table 2.

Success rate, recurrence rate, and re-PCI rate

The optimized group's success rate, recurrence rate and rePCI rate were 93.33%, 8.89%, and 6.67%, respectively. In the conventional group, they were 66.67%, 22.22%, 17.78%, respectively. The success rate, recurrence rate and rePCI rate of the optimized emergency nursing process were better than those of the conventional group (all $P < .05$). Table 3.

Negative Emotions

In the optimized group, the HAMA scores before the intervention, in the intervention, and after the intervention were 34.06±2.45, 20.40±2.03, 11.00±1.58, respectively, and the HAMA scores were 25.10±2.93, 15.30±2.89, 7.51±1.77, respectively. In the conventional group, the HAMA scores before the intervention, in the intervention, and after the intervention were 35.09±2.41, 27.54±2.36, 18.67±1.84, respectively, and the HAMA scores were 25.60±2.73, 20.27±2.56, 14.07±1.93, respectively. In the middle and late period of intervention, the HAMD and HAMA scores of the optimization group were better than those of the conventional group, and the negative emotions were optimized more ($P < .05$). Attached Table 4, Figure 1, 2.

Adverse reactions

After 2 months of follow-up, there were 3 cases of adverse reactions in the optimization group and 9 cases in the conventional group. The optimized group's malignant arrhythmology, heart failure, and respiratory failure were 1, 1, and 1, respectively. And in the conventional group, they were 3, 4, 2, respectively. The optimization group was more safe ($P < .05$). Attached Table 5, Figure 3.

DISCUSSION

Patients with AMI complicated with hypertension have an urgent onset and rapid development of the disease, and

Table 1. Comparison of baseline data between the two groups [$\bar{x} \pm s$ (n, %)]

Project		Optimize group (n = 45)	conventional group (n = 45)	t/χ^2	*P* value
Age (years)		61.69±6.23	61.67±5.65	0.018	.986
Gender	Male	23(51.11)	25(55.56)	0.097	.907
	Female	22(48.89)	20(44.44)		
Time from onset to admission (h)		2.67±0.69	2.68±0.65	0.078	.938
Family history		17(37.78)	15(33.33)	0.124	.879

Table 2. Comparison of rescue efficiency between the two groups ($\bar{x} \pm s$)

Group	Number	First time (min)	Start PCI time (min)	Start time of ECG (min)
Optimize group	45	39.23±6.28	45.13±8.60	4.18±0.69
conventional group	45	49.78±9.14	60.40±8.16	6.87±1.00
t		6.380	8.635	14.913
P value		<.001	<.001	<.001

Table 3. Comparison of treatment success rate, disease recurrence rate and rePCI rate between the two groups (n, %)

Group	Number	Success rate of treatment	Disease recurrence rate	PCI rate again
Optimize group	45	42(93.33)	4(8.89)	3(6.67)
conventional group	45	30(66.67)	10(22.22)	8(17.78)
χ^2		0.176	0.154	0.098
P value		.870	.874	.096

Table 4. Comparison of negative emotions between the two groups before, during and after intervention ($\bar{x} \pm s$)

Group	HAMD(score)	HAMA(score)
Optimize group (n = 45)	34.06±2.45	25.10±2.93
Before the intervention		
In the intervention	20.40±2.03	15.30±2.89
After the intervention	11.00±1.58	7.51±1.77
conventional group (n = 45)	35.09±2.41	25.60±2.73
Before the intervention		
In the intervention	27.54±2.36	20.27±2.56
After the intervention	18.67±1.84	14.07±1.93
F_{time}	15.419	8.636
P_{time}	<.001	<.001
$F_{time\ point*group}$	21.222	16.812
$P_{time\ point*group}$	<.001	<.001

Figure 1. Comparison of HAMD scores between the two groups

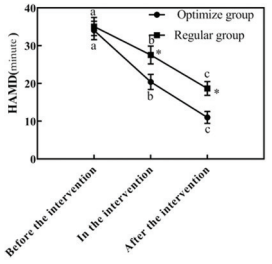


Figure 2. Comparison of HAMA scores between the two groups

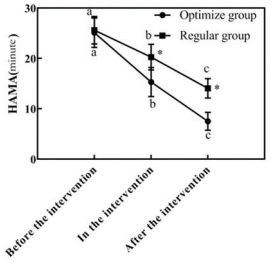
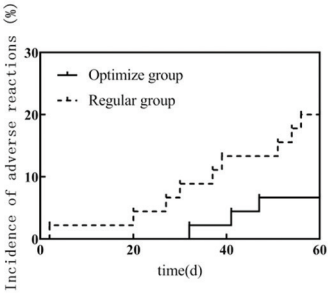


Table 5. Comparison of adverse reactions between the two groups at 2 months of postoperative follow-up (n, %)

Group	Number	Malignant arrhythmology	Heart failure	Respiratory failure	Combined
Optimize group	45	1(2.22)	1(2.22)	1(2.22)	3(6.67)
conventional group	45	3(6.67)	4(8.89)	2(4.44)	9(20.00)
χ^2		0.157	0.184	0.115	0.103
P value		.889	.864	.793	.789

Figure 3. Comparison of the incidence of adverse reactions between the two groups at two months of follow-up



relevant investigations show that the death toll of this disease within 1 hour after onset accounts for about 60% of the total death toll. Therefore, if not treated in time, the life safety of patients will be seriously threatened.[11,12] PCI, as a surgical method for dredging the coronary lumen by transcatheter cardiac catheterization, plays an important role in rescuing acute ST-segment and non-ST-segment elevation myocardial infarction.[13,14] PCI is the preferred treatment for AMI and is widely used in clinical practice. Early PCI can restore the blood supply of the heart in time, save cardiomyocytes, reduce the mortality of patients, and reduce the incidence of prognostic cardiovascular events. However, there are some defects in the routine preoperative nursing process (insufficient mastery of patients' condition by medical staff, poor cooperation, etc.), which leads to insufficient emergency efficiency.[15] Based on this, the author conducted a retrospective analysis of our hospital's AMI patients with hypertension who underwent optimized emergency nursing process to observe its efficacy.

Line, according to the results of this study to optimize the research object of emergency nursing process to rescue efficiency (emergency time, start time of PCI, and electrocardiogram) significantly superior to patients with the emergency nursing process, mainly because the optimization of emergency nursing management, the process has a team, have a regular training mission, medical personnel first aid knowledge and professional degrees are stronger, to speed up the pre-hospital rescue, Treat patients promptly to ensure rescue efficiency.[16] In addition, the authors found that the treatment success (93.33% vs 66.67%) , recurrence rate (8.89% vs 22.22%, and rePCI rates (6.67% vs 17.78%) of the optimized group were better than those of the conventional group. To investigate the reasons, the optimization of the emergency nursing process will send patients to rescue through the green channel, a timely evaluation of the patient's condition, and a detailed understanding of the patient's past history and allergy history. At the same time, venous access and ECG monitoring were established in time to reduce unnecessary waste of time and control the development of the disease as soon as possible.[17] Zhan[18] Scholars are consistent with the above conclusions of this study, which supports the authenticity and reliability of the results of this study. Optimization of the emergency nursing process can identify a patient's myocardial infarction as early as possible so that timely treatment can be initiated, and realize early PCI can restore blood flow, reduce myocardial damage, improve the survival rate and prognosis of patients. With real-time monitoring of ECG, blood pressure, oxygen saturation, and other indicators, optimization emergency nursing can be found in time and treatment of possible complications.

In addition, the author also found that the negative emotions (7.51±1.77 vs 14.07±1.93) and adverse reactions (3 vs 9) of patients with optimized emergency nursing processes were lower than those of the conventional group. The reasons were analyzed as follows: Optimized emergency nursing process can provide emotional management for patients, actively communicate with them, help patients to face treatment with a positive attitude, and reduce their psychological pressure. At the same time, the special person in charge provides the family members with counseling and relevant guidance to reduce the waste of time caused by the family members' unfamiliarity with the relevant process, speed up the rescue time of patients, and provide the patients with reasonable diet and exercise guidance to promote the postoperative recovery of patients, reduce the occurrence of adverse reactions, and improve the safety of surgery.[19,20]

Limitations

In this study, we provide evidence to support the effectiveness of optimization of the emergency nursing process before PCI for AMI complicated with hypertension. However, due to the small number of subjects selected in this study, selection bias and any other potential biases that might have affected the results, so subsequent studies with larger sample sizes are needed for analysis. The retrospective nature of the analysis, which might limit the establishment of causal relationships. In addition, the follow-up time of this study was only 2 months, and the follow-up time can be extended in future research to observe its impact on long-term prognosis. In the future, prospective studies, larger sample sizes, or longer follow-up periods to further investigate the impact of optimized nursing processes can further confirm the results of this study and promote its clinical application.

CONCLUSION

Optimizing the emergency nursing process before PCI for AMI complicated with hypertension can improve patients' rescue efficiency, accelerate patient recovery, and enhance patient treatment compliance, which is worthy of good clinical application value. Optimizing the emergency nursing process should be consider in clinical, which may have

potential impact on patient outcomes, healthcare resource utilization, or the quality of care within the healthcare system.

DATA AVAILABILITY

The simulation experiment data used to support the findings of this study are available from the corresponding author upon request.

CONFLICT OF INTEREST

The authors have no potential conflicts of interest to report relevant to this article.

AUTHOR CONTRIBUTIONS

YD and JS designed the study and performed the experiments, YD collected the data, JS analyzed the data, YD and JS prepared the manuscript. All authors read and approved the final manuscript.

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