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Analysis of the Emergency Rescue Nursing Intervention Effect and Rescue Success Rate for Patients with Traumatic Hemorrhagic Shock

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Abstract: *Objective:* To analyze the value of emergency rescue nursing intervention in the care of patients with traumatic hemorrhagic shock and its impact on the success rate of rescue efforts. *Methods:* A total of 80 patients with traumatic hemorrhagic shock were selected as samples, with the timeframe from July 2022 to July 2023. The patients were randomly divided into two groups using a random number table method. Group A received emergency rescue nursing, while Group B received routine nursing care. The success rate of rescue, rescue indicators, complication rates, and family satisfaction with nursing care were compared between the two groups. *Results:* The rescue success rate in Group A was higher than in Group B ($P < 0.05$); the total blood loss in Group A was less, and the rescue time, full transportation time, and hospitalization time were shorter than in Group B ($P < 0.05$); the complication rate of patients with traumatic hemorrhagic shock in Group A was lower than in Group B ($P < 0.05$); the family satisfaction with emergency nursing care in Group A was higher than in Group B ($P < 0.05$). *Conclusion:* Emergency rescue interventions for patients with traumatic hemorrhagic shock can reduce blood loss, shorten rescue times, and improve the success rate of shock rescue, providing a safe and effective approach.

Keywords: Emergency rescue nursing; Traumatic hemorrhagic shock; Rescue success rate

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1. Introduction

Traumatic hemorrhagic shock is associated with organ damage caused by violence and is characterized by a large amount of blood loss and low blood volume, which can lead to compensatory dysfunction. Common symptoms include rapid breathing, pallor, tachycardia, and a certain risk of death [1]. Traumatic hemorrhagic shock often occurs suddenly. Therefore, during emergency treatment, nursing interventions should be supplemented to shorten the emergency rescue time and improve rescue outcomes. Conventional emergency nursing follows physicians' instructions passively, with a single-focus approach and poor rescue outcomes.

Emergency rescue nursing, on the other hand, involves providing care based on the pathological characteristics of different patients with traumatic hemorrhagic shock, which can improve the efficiency of rescue and reduce complications associated with hemorrhagic shock [2]. This study uses 80 patients with traumatic hemorrhagic shock admitted between July 2022 and July 2023 as samples to explore the value of emergency rescue nursing interventions.

2. Materials and methods

2.1. General information

A total of 80 patients with traumatic hemorrhagic shock were selected as samples, with the timeframe from July 2022 to July 2023. The patients were randomly divided into two groups using a random number table method. Group A had 26 males and 14 females, aged 21 to 68 years, with an average age of (49.42 ± 3.57) years. The onset time ranged from 15 minutes to 3 hours, with an average of (1.42 ± 0.36) hours. Group B had 27 males and 13 females, aged 22 to 69 years, with an average age of (49.53 ± 3.61) years. The onset time ranged from 18 minutes to 3 hours, with an average of (1.44 ± 0.39) hours. There was no statistically significant difference between Group A and Group B in terms of patients with traumatic hemorrhagic shock, $P > 0.05$.

2.2. Inclusion and exclusion criteria

Inclusion criteria: (1) Massive blood loss after trauma, meeting the criteria for hemorrhagic shock; (2) Informed consent; (3) Time from onset to hospital admission less than 4 hours.

Exclusion criteria: (1) Coagulation dysfunction; (2) Multiple organ damage; (3) Severe infection; (4) Abnormal immune system.

2.3. Methods

2.3.1. Group A emergency rescue nursing

(1) Assist doctors in completing examinations: Assess the condition of shock patients, assist patients with hemorrhagic shock in completing ultrasound, urinalysis, blood tests, and physical examinations, and record the patient's condition. Establish 2–3 intravenous access points, administer fluids and blood transfusion as prescribed, and accurately record the fluid input and output of patients with hemorrhagic shock. Use electrocardiographic monitoring to assess fluctuations in blood pressure, respiration, consciousness, and heart rate, and observe changes in the patient's pupils. Assess whether the patient's blood pressure drops suddenly or if there are abnormalities in breathing, and assist doctors in rescue efforts if necessary. Once the vital signs of the hemorrhagic shock patient stabilize, move the patient into a lateral recumbent position with the head slightly elevated, administer oxygen, and clean the oral cavity to maintain clear airways.

(2) Control bleeding: During emergency rescue, quickly control bleeding by selecting a hemostasis strategy based on the amount of blood loss and the condition of the patient. Methods may include pressure dressing or surgical hemostasis. If the patient has complications such as pneumothorax, rib fractures, or organ damage and blood clots are present, regularly clear the airway to prevent lung infection. Additionally, if the patient suffers from severe trauma, they may experience intense localized pain, which could exacerbate shock, so appropriate pain medication should be administered based on the

patient's condition.

(3) Emotional reassurance: Patients with traumatic hemorrhagic shock may experience fear and anxiety due to pain, critical condition, and breathing difficulties. Emergency rescue nurses should patiently provide emotional guidance and reassurance. During the rescue process, nurses can calm the patient by explaining the illness, informing them of the treatment plan, and sharing examples of successful rescue cases to improve patient cooperation.

(4) Maintain smooth respiration: During emergency rescue, closely monitor the patient's respiratory fluctuations. Use arterial blood gas analysis to assess whether the patient is hypoxic. If the patient's condition is stable and circumstances allow, the nurse can help the patient move their upper limbs to promote lung expansion and alleviate hypoxia. If the patient becomes comatose, maintain a lateral recumbent position, clear airway secretions, and administer oxygen. If the patient experiences respiratory depression, perform intubation as quickly as possible to meet oxygen demands. If the patient has severe hypoxia, doctors may prescribe respiratory stimulants to restore physiological functions and alleviate hypoxia. During emergency anti-shock treatment, it is crucial to protect the patient's organs and minimize the impact of hemorrhagic shock on organ function. Additionally, ensures the correction of water-electrolyte imbalances to maintain the stability of the body's internal environment.

(5) Monitor urine output: When the urine output of a patient with traumatic hemorrhagic shock is less than 25 mL/h, symptoms of anuria or oliguria may be present, indicating a risk of acute renal failure. Therefore, it is important to monitor the patient's urine output and record fluctuations in arterial pressure and hemodynamics. Fluid supplementation should be administered based on test results. For patients with severe trauma, the nurse should clean and disinfect deep wounds, administer anti-infection drugs and antibiotics as prescribed, and observe the condition of adjacent skin and temperature changes.

2.3.2. Group B routine emergency nursing

For patients with traumatic hemorrhagic shock, treat the wound, establish intravenous access to replenish fluids and blood, administer symptomatic treatment based on the patient's condition, assess fluctuations in vital signs, and prepare for emergency surgery.

2.4. Observation indexes

(1) Rescue success rate: Rescue was considered successful if the patient's shock was relieved, related symptoms improved, and vital signs stabilized. The death of the patient was considered a failure of the rescue.

(2) Rescue indicators: Indicators such as blood loss, rescue time, total transport time, and hospitalization time were recorded.

(3) Complications: Water-electrolyte imbalance, infection, and organ failure were recorded.

(4) Family satisfaction with nursing: Family satisfaction with emergency rescue nursing was evaluated using a self-made emergency rescue nursing satisfaction scale, assessed in three dimensions. The scale was scored from 0 to 100 points, with scores > 80 indicating "very satisfied," scores between 40 and 80 indicating "basically satisfied," and scores < 40 indicating "dissatisfied."

2.5. Statistical analysis

Data from patients with traumatic hemorrhagic shock were processed using SPSS 21.0. Percentage (%) and chi-square (χ^2) tests were used for categorical variables, and mean ± standard deviation (SD) and *t*-tests were used for continuous variables. Statistical differences were considered significant when $P < 0.05$.

3. Results

3.1. Comparison of resuscitation success rate

As shown in **Table 1**, the success rate of resuscitation in Group A (100.00%) was higher than that in Group B (90.00%) ($P < 0.05$).

Table 1. Comparison of resuscitation success rate between the two groups [*n* (%)]

Groups	Resuscitation success rate	Sickness and death rate
Group A ($n = 40$)	40 (100.00)	0 (0.00)
Group B ($n = 40$)	36 (90.00)	4 (10.00)
χ^2	4.2105	
P	0.0402	

3.2. Comparison of resuscitation indicators

As shown in **Table 2**, the total bleeding volume of Group A was less than Group B, and the resuscitation time, the whole transfer time, and the length of hospitalization were all shorter than that of Group B ($P < 0.05$).

Table 2. Comparison of resuscitation indexes between the two groups (mean ± SD)

Groups	Total bleeding volume (mL)	Resuscitation time (min)	Total transfer time (h)	Hospitalization time (d)
Group A ($n = 40$)	349.42 ± 15.25	36.05 ± 3.25	2.08 ± 0.88	3.41 ± 0.84
Group B ($n = 40$)	504.84 ± 18.44	45.87 ± 3.89	3.57 ± 0.96	4.96 ± 0.91
t	37.8723	11.2961	6.6713	7.2980
P	0.0000	0.0000	0.0000	0.0000

3.3. Comparison of complication indicators

The complication rate of patients in Group B (15.00%) was higher than in Group A (2.50%) ($P < 0.05$).

Table 3. Comparison of complication indicators between the two groups [*n* (%)]

Groups	Hydro-electrolyte disorders	Infections	Organ failure	Incidence
Group A ($n = 40$)	0 (0.00)	1 (2.50)	0 (0.00)	1 (2.50)
Group B ($n = 40$)	2 (5.00)	3 (7.50)	1 (2.50)	6 (15.00)
χ^2	-	-	-	3.9139
P	-	-	-	0.0479

3.4. Comparison of treatment satisfaction indicators

As shown in **Table 4**, the satisfaction of family members with emergency care in Group A (97.50%) was higher

than that of Group B (85.00%) ($P < 0.05$).

Table 4. Comparison of family care satisfaction indexes between the two groups [*n* (%)]

Groups	Very satisfied	Satisfied	Dissatisfied	Satisfaction rate
Group A ($n = 40$)	35 (87.50)	4 (10.00)	1 (2.50)	39 (97.50)
Group B ($n = 40$)	27 (67.50)	7 (17.50)	6 (15.00)	34 (85.00)
χ^2	-	-	-	3.9139
P	-	-	-	0.0479

4. Discussion

Traumatic hemorrhagic shock refers to a condition of massive bleeding caused by trauma, leading to insufficient effective circulating blood volume, which can affect blood perfusion and manifest as metabolic disorders and organ dysfunction [3]. After the onset of traumatic hemorrhagic shock, if the blood loss is ≤ 15%, it is classified as Grade I. At this stage, the patient experiences mild tachycardia without complications. If blood loss ranges from 15%–30%, it is classified as Grade II, where the heart rate increases to over 100 beats per minute, accompanied by delayed capillary refill, cool and moist skin, and rapid breathing. If blood loss is between 30%–40%, it is classified as Grade III, where systolic blood pressure (SBP) significantly decreases, accompanied by tachycardia and rapid breathing. If blood loss exceeds 40%, it is classified as Grade IV, in which diastolic blood pressure (DBP) may not be detectable, and SBP drops sharply, accompanied by tachycardia and loss of consciousness [4]. Therefore, after the onset of traumatic hemorrhagic shock, immediate symptomatic intervention is necessary to save the patient's life.

During the emergency rescue of patients with hemorrhagic shock, the principles of "rescue > treatment" and "prioritize life-threatening injuries" should be followed. Accurate evaluation of the patient's disease progression, early assessment of initial shock symptoms, and the formulation of rescue strategies based on the progression of hemorrhagic shock can improve the success rate of shock treatment [5]. Conventional emergency nursing requires nurses to complete tasks according to medical orders. While this demands high levels of responsibility, skill, and theoretical knowledge, there are still shortcomings in rescue nursing beyond medical orders, and the prevention of shock-related complications is often overlooked, leading to poor prognosis in some patients and an increased risk of hemorrhagic shock complications [6]. In recent years, the emergency rescue nursing model has gradually been applied to the care of patients with traumatic hemorrhagic shock. This model requires nurses to have a high level of professional competence, familiarity with emergency nursing knowledge, and proficiency in nursing techniques. Nurses must also seize the golden window for shock rescue and provide efficient care to reduce the risk of shock-related complications [7]. Moreover, during the emergency rescue, nurses must have strong observational and anticipatory skills, be able to quickly assess the patient's disease progression, and provide timely feedback to physicians about fluctuations in the patient's condition, allowing for appropriate adjustments to the rescue strategy [8].

According to the analysis of data in this study, the rescue success rate in Group A was 100.00%, significantly higher than Group B's 90.00%, with $P < 0.05$. This suggests that emergency rescue nursing can improve the success rate of rescue efforts. The reason for this is that emergency rescue nursing prioritizes life-threatening injuries and emphasizes cooperation between medical staff, allowing for the scientific deployment

of emergency personnel. This ensures the systematic and safe coordination of out-of-hospital emergency care and in-hospital treatment, which helps improve the success rate of rescue efforts [9]. Another set of data shows that the total blood loss in Group A was lower than that of Group B, and the rescue time, transfer time, and hospitalization time were all shorter in Group A than in Group B, with $P < 0.05$. This suggests that emergency rescue nursing can shorten the course of hemorrhagic trauma and reduce blood loss during the rescue process. The reason for this is that emergency rescue nursing adjusts nursing strategies according to the patient's disease progression and nursing needs, while also taking preventive measures against various risk factors, thereby reducing the harmful effects of blood loss and promoting better patient outcomes [10]. Another set of data shows that the complication rate in Group A was 2.50%, significantly lower than Group B's 15.00%, with $P < 0.05$. This suggests that emergency rescue nursing can reduce the incidence of hemorrhagic shock-related complications. The reason for this is that emergency rescue nursing includes precise assessments of individual patient conditions and disease progression, along with targeted nursing interventions to mitigate potential risk factors, reducing complications. The final set of data shows that family satisfaction with emergency nursing in Group A was 97.50%, significantly higher than Group B's 85.00%, with $P < 0.05$. This suggests that emergency rescue nursing can effectively improve family satisfaction with emergency care. The reason for this is that during emergency rescue nursing, comprehensive assessments of the patient's psychological and physical conditions, monitoring of vital signs, and anticipation of potential complications help stabilize the patient's condition. Additionally, targeted emotional support for patients, guidance on medication, and the establishment of intravenous access for blood and fluid replenishment as per medical instructions correct electrolyte imbalances and promote recovery from shock, resulting in higher family satisfaction.

5. Conclusion

In conclusion, the application of emergency rescue nursing in the care of patients with traumatic hemorrhagic shock can improve the success rate of emergency rescue, reduce the risk of shock-related complications, and shorten the course of shock. This approach has significant value for widespread application.

Disclosure statement

The author declares no conflict of interest.

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