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Effect of Nursing Interventions Based on APACHE II Scores on Gastrointestinal Function Recovery Time in Patients with Severe Pancreatitis

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Abstract: *Objective:* To explore the application effect of nursing interventions based on APACHE II scores in patients with severe pancreatitis and its impact on the recovery time of the gastrointestinal function. *Methods:* A total of 86 patients with severe pancreatitis treated in our hospital from March 2023 to March 2024 were selected. Using a random number table method, the patients were divided into a control group receiving conventional nursing care and a study group receiving nursing interventions based on APACHE II scores, with 43 patients in each group. The intervention effects of the two groups were compared. *Results:* The recovery time of gastrointestinal function in the study group was significantly shorter than that in the control group ($P < 0.05$). After the intervention, the quality of life scores in the study group was significantly higher than those in the control group ($P < 0.05$). The incidence of complications in the study group was significantly lower than in the control group ($P < 0.05$). *Conclusion:* Nursing interventions based on APACHE II scores can shorten gastrointestinal recovery time and reduce complications in patients with severe pancreatitis, contributing to improved quality of life.

Keywords: Severe pancreatitis; APACHE II score; Nursing; Gastrointestinal function

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1. Introduction

As a common condition in intensive care units, severe pancreatitis poses critical risks to patients due to its rapid progression and changes. The clinical mortality rate of the disease ranges from 36% to 50% [1]. Severe pancreatitis damages multiple organs in the body and can lead to complications such as multiple organ dysfunction syndrome, systemic inflammatory response syndrome, and pancreatic tissue infection, significantly increasing the risk of mortality [2]. Studies have shown that effective treatment and intervention for severe pancreatitis can reduce the risk of complications and mortality [3]. Based on this, a comparative study was conducted on 86 patients with severe pancreatitis treated at our hospital from March 2023 to March 2024 to investigate the effects of nursing

interventions based on APACHE II scores on the recovery time of the gastrointestinal function.

2. Materials and methods

2.1. General information

A total of 86 patients with severe pancreatitis admitted to our hospital from March 2023 to March 2024 were selected. Using a random number table method, the patients were divided into a control group (receiving conventional nursing care) and a study group (receiving nursing interventions based on APACHE II scores), with 43 patients in each group. The general information of the two groups was comparable ($P > 0.05$), as shown in **Table 1**. All patients and their families were informed about the purpose and methods of the study and signed informed consent forms. The study was conducted with the approval of the hospital's ethics committee.

Table 1. Comparison of general information between the two groups

Group	*n*	Gender		Age (years)	Disease duration (h)	BMI (kg/m²)
		Male (%)	Female (%)			
Control	43	24 (79.07)	19 (44.19)	57.34 ± 8.32	2.25 ± 0.23	23.66 ± 3.51
Study	43	23 (53.48)	20 (46.51)	57.12 ± 8.61	2.23 ± 0.14	23.75 ± 3.62
χ^2 / t		0.047		0.120	0.487	0.117
P		0.829		0.904	0.626	0.907

2.2. Inclusion and exclusion criteria

Inclusion criteria:

(1) Patients with typical clinical symptoms meet the diagnostic criteria [4] and are confirmed by diagnostic tests.

(2) Patients capable of cooperating with nursing care independently or with the assistance of family members.

(3) Patients with an Acute Physiology and Chronic Health Evaluation II (APACHE II) score of no less than 8.

Exclusion criteria:

(1) Patients with cognitive or consciousness disorders, severe organ dysfunction, or malignant tumors.

(2) Patients with pancreatic hemorrhage or necrosis.

(3) Patients with bradycardia or hemodynamic instability.

(4) Patients with incomplete clinical data.

2.3. Methods

2.3.1. Control group

Patients received conventional nursing care, including gastrointestinal decompression, medication guidance, monitoring vital signs, and observing disease progression.

2.3.2. Study group

On the basis of conventional care, patients received nursing interventions tailored to APACHE II scores:

(1) APACHE II score evaluation: Specialized physicians with intensive care qualifications conducted APACHE II scoring upon admission. Higher scores were assigned to higher-level nurses, with

scoring repeated every 12 hours to adjust nursing methods. Senior nurses with provincial critical care qualifications acted as team leaders to collect score data, supervise implementation, and ensure adherence to nursing measures.

(2) Interventions based on APACHE II scores:

(a) Scores below 16:

(i) 1:1 nurse-patient ratio. Nurses used communication techniques to address patient and family concerns, explain the disease and treatments, and alleviate anxiety.

(ii) Vital signs (e.g., temperature, respiration) were recorded, along with cough frequency and sputum volume. Skin integrity was monitored.

(iii) Abdominal massage and acupressure (e.g., Hegu and Zusanli points) were performed to promote bowel movements.

(iv) Patients were guided to move their limbs to prevent deep vein thrombosis (DVT).

(b) Scores 16–25:

(i) 1:1.5 nurse-patient ratio. Individualized nursing plans were developed.

(ii) Vital signs were recorded every 2 hours. Abdominal massage, acupressure, regular turning, and limb massage were performed.

(iii) Preventive measures against DVT and pressure ulcers were implemented.

(c) Scores above 25:

(i) 1.5:2 nurse-patient ratio. Vital signs were monitored hourly, and cough and sputum volume were recorded.

(ii) Airway management and turning were performed every 0.5 hours.

(iii) Abdominal massage, acupressure, and limb activity guidance were strengthened.

(iv) Patients were encouraged to lift their hips 80 times daily, soak their feet twice daily, and use intermittent gradient pressure devices to prevent DVT in comatose patients.

2.4. Observation indicators

(1) Gastrointestinal function recovery time: Recovery metrics included time to first flatulence, bowel movement, relief from abdominal distension and pain, and restoration of bowel sounds.

(2) Quality of life scores: Quality of life was assessed using the SF-36 Health Survey [5], covering dimensions such as bodily pain, physical function, role-physical, general health, vitality, social function, emotional role, and mental health. Each dimension had a maximum score of 100, with higher scores indicating a better quality of life.

(3) Incidence of complications: Complications assessed included pancreatic infection, pneumonia, and respiratory failure.

2.5. Statistical methods

Data were analyzed using SPSS 22.0 software. Normally distributed measurement data were expressed as mean ± standard deviation (SD) and tested with *t*-tests, while count data were expressed as frequency [*n* (%)] and tested with χ^2 tests. A *P*-value of < 0.05 was considered statistically significant.

3. Results

3.1. Comparison of gastrointestinal function recovery time between the two groups

The gastrointestinal function recovery time in the study group was significantly shorter than in the control group ($P < 0.05$). See **Table 2**.

Table 3. Comparison of gastrointestinal function recovery time between the two groups (mean ± SD)

Group	*n*	First flatulence time (h)	First bowel movement time (h)	Abdominal pain relief time (d)	Abdominal distension relief time (d)	Bowel sound recovery time (d)
Control	43	22.32 ± 5.32	51.33 ± 12.32	5.13 ± 1.32	6.54 ± 1.32	5.98 ± 1.63
Study	43	18.56 ± 4.43	31.42 ± 6.34	3.43 ± 0.53	3.65 ± 0.85	4.15 ± 1.03
t		3.561	9.423	7.837	12.071	6.224
P		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

3.2. Comparison of quality of life scores before and after intervention between the two groups

The quality of life scores in the study group after the intervention were significantly higher than those in the control group ($P < 0.05$). See **Table 3**.

Table 3. Comparison of quality of life scores before and after intervention (mean ± SD, points)

		Control group (*n* = 43)	Study group (*n* = 43)	*t*	*P*
Bodily pain	Before	45.63 ± 6.53	45.62 ± 6.34	0.007	0.994
	After	81.02 ± 8.32*	91.45 ± 7.35*	6.161	< 0.001
Physiological function	Before	47.35 ± 5.63	47.53 ± 5.45	0.151	0.881
	After	81.03 ± 6.35*	89.23 ± 7.33*	5.545	< 0.001
Physical function	Before	43.32 ± 9.32	43.63 ± 9.42	0.153	0.878
	After	82.42 ± 6.42*	91.06 ± 5.52*	6.692	< 0.001
General health	Before	45.13 ± 6.23	45.24 ± 6.35	0.081	0.936
	After	82.78 ± 6.35*	90.11 ± 8.36*	4.579	< 0.001
Vitality	Before	47.14 ± 6.62	47.46 ± 6.21	0.231	0.818
	After	83.25 ± 7.35*	92.02 ± 8.52*	5.111	< 0.001
Social function	Before	44.24 ± 6.73	44.32 ± 6.35	0.057	0.955
	After	85.01 ± 8.35*	93.52 ± 9.42*	4.433	< 0.001
Emotional function	Before	46.24 ± 8.35	46.44 ± 8.31	0.111	0.912
	After	85.62 ± 6.35*	93.22 ± 8.25*	4.787	< 0.001
Mental health	Before	43.53 ± 9.42	43.63 ± 9.22	0.050	0.960
	After	84.98 ± 6.33*	92.89 ± 3.35*	7.242	< 0.001

Note: Compared with before intervention, *$P < 0.05$.

3.3. Comparison of complication rates between the two groups

The complication rate in the study group was significantly lower than in the control group ($P < 0.05$). See **Table 4**.

Table 4. Comparison of complication rates between the two groups [*n* (%)]

Group	*n*	Pancreatic infection	Pneumonia	Respiratory failure	Total incidence
Control	43	3 (6.98)	2 (4.65)	1 (2.33)	6 (13.95)
Study	43	1 (2.33)	0 (0.00)	0 (0.00)	1 (2.33)
χ^2					3.888
P					0.049

4. Discussion

The onset of severe acute pancreatitis (SAP) is associated with various factors, including excessive alcohol consumption, overeating, and history of gallbladder disease, with middle-aged and elderly individuals being at higher risk [6]. SAP has an acute onset and severe progression, with a high mortality rate that significantly impacts patients' prognosis and quality of life. In addition to implementing scientific and standardized treatment measures, effective nursing interventions are crucial for the treatment and prognosis of SAP patients [7].

The Acute Physiology and Chronic Health Evaluation II (APACHE II) scoring system is primarily used to assess the condition and prognosis of critically ill patients. Research by Bi *et al.* [8] has shown that the APACHE II score is positively correlated with pancreatic infection in SAP patients. This correlation provides guidance for clinical interventions and has a positive effect on improving patient outcomes. Interventions guided by APACHE II scores can enhance the specificity and effectiveness of nursing care, thereby improving clinical outcomes [9].

In SAP patients, inflammatory mediators released due to various injuries and ischemia-reperfusion impair the intestinal mucosal barrier function, leading to an imbalance and translocation of intestinal toxins and metabolites. This can result in gut-derived bacteria and endotoxemia, making the restoration of gastrointestinal function critically important [10]. Tan *et al.* [11] noted that scientific nursing interventions in SAP patients can promote gastrointestinal recovery.

In this study, the gastrointestinal recovery time in the study group was significantly shorter than that in the control group. The nursing interventions, designed based on patients' APACHE II scores, enabled targeted and individualized care, enhancing the effectiveness of the interventions. Abdominal and acupoint massages promoted gastrointestinal recovery. Furthermore, the quality of life scores in the study group after the intervention were significantly higher than those in the control group. Effective nursing interventions improved disease control, alleviated symptoms, reduced psychological burdens, and enhanced physical and mental comfort, contributing to patient recovery and improved quality of life.

The results also demonstrated that the incidence of complications in the study group was significantly lower than in the control group. Nursing interventions based on APACHE II scores facilitated gastrointestinal recovery and improved patient monitoring, enabling timely detection of disease changes. Preventive measures were taken against potential complications, effectively reducing their incidence.

5. Conclusion

In conclusion, nursing interventions guided by APACHE II scores in SAP patients can promote gastrointestinal recovery, reduce complications, and improve quality of life, demonstrating clinical value.

Disclosure statement

The author declares no conflict of interest.

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