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Intervention and Effect of Targeted Anesthesia Nursing Measures on Post-operative Emergence Agitation in Elderly Patients Undergoing General Anesthesia

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Abstract

To explore the effect of targeted anesthesia nursing measures on emergence agitation (EA) in elderly patients who were anesthetized by general anesthesia. In this study, 186 cases of elderly patients admitted to Deyang People's Hospital for general anesthesia surgery from March 2022 to March 2024 were selected prospectively, and the 186 patients included in the study were randomly divided into the control group (n=93) and the observation group (n=93) according to the method of randomized numerical table. Routine nursing measures were adopted in the resuscitation period of the control group; targeted anesthetic nursing measures were adopted in the resuscitation period of the observation group; routine nursing measures were adopted in the resuscitation period of the control group. The control group used conventional nursing measures during the resuscitation period after anesthesia, and the observation group used targeted anesthesia nursing measures during the resuscitation period after anesthesia, the incidence of EA, the incidence of EA-related complications, patient satisfaction and the incidence of hypothermia during anesthesia resuscitation in the two groups were compared. The results show that the incidence of EA in the observation group

with targeted anesthesia nursing measures was significantly lower than that in the control group ($P < 0.05$), the incidence of EA-related complications in the observation group with targeted anesthesia nursing measures was significantly lower than that in the control group ($P < 0.05$), the satisfaction score in the observation group with targeted anesthesia nursing measures was significantly higher than that in the control group ($P < 0.05$), and the rate of hypothermia during resuscitation of the patients in the observation group with targeted anesthesia nursing measures was significantly lower than that in the control group ($P < 0.05$). The incidence of hypothermia during anesthesia resuscitation in the observation group was significantly lower than that in the control group ($P < 0.05$). In summary, targeted anesthesia nursing interventions can effectively reduce the incidence of postoperative EA, the incidence of EA-related adverse events and hypothermia during resuscitation in elderly patients, and improve patient satisfaction, which is worthy of application and promotion.

Keywords: targeted anesthesia nursing measures, elderly patients, general anesthesia, post-anesthesia awakening agitation, nursing intervention

1. Introduction

Emergence agitation (EA) is a common post-operative complication after surgical general anesthesia, which often occurs during the recovery period of anesthesia, and is mainly manifested as acute mental disorders, in which patients suffer from sudden excitement, agitation, confusion, and impaired consciousness (Duran H T, Kizilkaya M, Aydinli A, et al, 2024; Robinson T N, Eiseman B, 2008). At present, the pathogenesis of EA is not clear, but relevant studies have pointed out that during general anesthesia, the dose of anesthesia drugs used is large, and in the recovery phase after surgery, patients' consciousness and bodily functions have not yet recovered, and they are affected by the stimulation of the anesthesia drugs left in the body, which leads to the emergence of the symptoms of EA in patients (Zhu H, Cheng L, Tang T, et al., 2021). Compared with young and middle-aged patients, the incidence of post-operative EA in elderly patients is significantly higher, about 40.7% (Assefa M T, Chekol W B, Melesse D Y, et al., 2022), which makes us pay attention to the intervention of post-operative EA in elderly patients. Targeted anesthesia care measures are a series of nursing interventions for patients after anesthesia, and their interventions are aimed at preventing and alleviating the complications that may arise in patients after anesthesia and promoting the recovery of patients' diseases. At present, there are few reports on targeted nursing interventions in post-operative EA after general anesthesia, so this study applies targeted anesthesia nursing interventions in post-operative EA after general anesthesia in elderly patients to observe the effect of the interventions.

2. Information and Methods

2.1 General Information

In this study, a total of 186 elderly patients admitted to Deyang People's Hospital from March 2022 to March 2024 who were intended to undergo general anesthesia surgery were selected in a prospective study. Inclusion criteria are as following: (1) age ≥ 65 years; (2) American Society of Anesthesiologists score (ASA) of grade I and II (Irlbeck T, Zwissler B, Bauer A.,

2017); (3) informed and agreed to participate in this study. Exclusion criteria are as following: (1) people with combined cognitive impairment or Alzheimer's disease; (2) people with combined traumatic brain injuries that may cause patients to develop mental behavioral disorder diseases after surgery; (3) people with serious post-operative complications that need to undergo surgical treatment again; (4) people with combined history of mania before surgery; (5) people with hemodynamic instability; (6) people with incomplete clinical data due to various reasons. The 186 patients included in the study were randomly divided into the control group (n=93) and the observation group (n=93) according to the random number table method. There was no statistically significant difference in the general information of the patients in the two groups, such as gender, age, surgical site, etc. (P>0.05), as shown in Table 1. This study was approved by the Medical Ethics Review Committee of our hospital (Ethics Review No. 2022-01-010-k02), and all the research subjects participating in this study gave their informed consent and signed the informed consent form.

Table 1. Comparison of General Information of Patients in Two Groups(n, $\bar{x} \pm s$)

Group Number of Cases	Number	Gender(n)		Age (Yrs)	Average Age ($\bar{x} \pm s$, Yrs)	Surgical Site(n)				
		Male	Female			Chest	Abdomen	Orthopedics	Urology	Gynecology
Control Group	93	43	50	66-76	69.56±7.38	24	24	17	15	13
Observation Group	93	58	35	68-79	71.38±6.45	20	26	19	14	14
t/χ2		1.743			1.790			0.626		
P		0.187			0.075			0.890		

2.2 Nursing Methods

The control group adopts conventional nursing measures during the recovery period after anesthesia, the specific interventions are as follows: after the end of the patient's operation, patients were pushed into the anesthesia recovery room (PACU), and were assisted to go to the decubitus position, with the head tilted to the side, elevate the head of the bed by about 10 ° - 15 °. After removing the oral secretions, provide the patient with oxygen inhalation and electrocardiographic monitoring to monitor the vital signs, and observe the patient's condition changes closely when the patient developed EA symptoms, then provide the appropriate interventions to intervene. When EA symptoms appeared in the patient, appropriate

interventions were carried out.

The observation group adopts targeted anesthesia nursing measures during the recovery period after anesthesia, and the specific interventions are as follows: (1) pre-operative health education: during the pre-operative visit, the anesthesia nurse, on the basis of the routine visit, conducts anesthesia-related education for the elderly patients who are about to be operated on to promote the understanding of anesthesia processes, and to alleviate the pre-operative anxiety and fear of the elderly patients; (2) pre-operative sleep interventions: most of the elderly patients have sleep disorders, and sleep disorders will affect the anesthesia effect of the patients. Elderly patients have sleep disorders, and sleep disorders will affect the effect of anesthesia, so for elderly patients with sleep disorders, they can be instructed to take oral melatonin or ghrelin and other drugs to help them sleep the night before the operation, but it is not recommended for elderly patients to take psychotropic sleeping aids orally because psychotropic sleeping aids may induce the occurrence of post-operative EA in the patients (Leung J M, Tang C, Do Q, et al. 2023; Gao J, Zheng Q, Liu M, et al., 2022); (3) post-operative thermal insulation measures: since the ambient temperature of the PACU is often lower than that of the regular PACU, the temperature of the PACU environment is lower than that of the PACU environment. PACU ambient temperature is often lower than the conventional ambient temperature, so patients are often prone to shivering induced EA after the end of surgery, especially the elderly patients with low basal metabolism, whose body temperature is also lower than that of the average adult patients, and it is easier for EA to occur, thus the anesthesia nurses need to emphasize on the heat preservation measures for the elderly patients entering the PACU, and the use of warming blankets to wrap the patients, so that the patients will rewarm as soon as possible. (4) Post-operative multi-mode analgesic nursing measures: with the disappearance of anesthetic drugs in the patient's body after general anesthesia, the patient's consciousness and limb sensation began to recover, the anesthesia nurse needs to pay attention to the patient's pain in a timely manner, and give the patient the appropriate analgesic treatment according to the patient's degree of pain; (5) Wake-up nursing: After the patient enters the PACU, the nurse in charge needs to call the patient's name every 1 minute and hold the patient's hands so that the patient's psychology can be pacified, thus realizing the prediction of the patient's consciousness.

2.3 Evaluation Criteria

EA occurrence: the Riker Sedation-Agitation Scale (SAS) was used to assess the occurrence of EA in the two groups of patients, which was scored on a scale of 1-7, in which 1 represented inability to arouse; 2 represented very sedated; 3 represented sedated; 4 represented quiet and cooperative; 5 represented agitated; 6 represented very agitated; 7 represented dangerously agitated, and patients were indicated to have EA when the score≥5 is present (Scott L K, Green R, McCarthy P J, et al., 2009).

Incidence of EA-related complications: the number of cases of elevated blood pressure (systolic blood pressure ≥160 mmhg or pulse pressure difference higher than 30% or more than the basal pulse pressure), increased heart rate (heart rate ≥100 beats/min), and unplanned extubation was recorded in the two groups of patients during anesthesia resuscitation.

Patient satisfaction in the two groups: 1 day after the operation when the anesthesia nurses returned to visit the patients, they used the hospital's homemade satisfaction survey scale for this anesthesia care satisfaction survey, which is divided into 100 points, and the higher the score represents the higher the degree of satisfaction of the patients.

The incidence of hypothermia during anesthesia resuscitation in the two groups of patients: record the temperature of the two groups of patients 5 minutes after entering the PACU, in which the patient's body temperature <30.0 ℃ represents the occurrence of hypothermia in the patient.

2.4 Statistical Methods

This study used SPSS 26.0 software to analyze all the data, in which the measurement data were expressed as independent samples t-test, and the count data were expressed as n (%) with c2 test, and the data of the two groups were expressed as statistically different with $P < 0.05$.

3. Results

3.1 Comparison of the Occurrence of EA Between the Two Groups of Patients

The incidence of EA in the observation group with targeted anesthesia care measures was significantly lower than that in the control group ($P < 0.05$), see Table 2.

Table 2. Comparison of the Occurrence of EA in the Two Groups (n, %)

Group	Number of cases	SAS≤4	SAS＝5	SAS＝6	SAS＝7	EA Incidence Rate
Control Group	93	77(82.79)	13(13.98)	3(3.23)	0(0.00)	16(17.21)
Observation Group	93	63(67.74)	20(21.51)	9(9.68)	1(1.08)	30(32.26)
χ^2						5.661
P						0.017

3.2 Comparison of the Incidence of EA-related Complications Between the Two Groups

The EA-related complication rate of the observation group with targeted anesthesia care measures was significantly lower than that of the control group ($P < 0.05$), see Table 3.

Table 3. Comparison of the Incidence of EA-related Complications Between the Two Groups (n, %)

Group	Number of Cases	Elevated Blood Pressure	Increased Heart Rate	Unplanned Extubation	Incidence of EA-related Complications
Control Group	93	7(7.53)	6(6.45)	1(1.08)	14(15.06)
Observation Group	93	20(21.51)	16(17.20)	3(3.23)	39(41.93)
χ^2					16.492
P					0.000

3.3 Comparison of Patient Satisfaction Between the Two Groups

The satisfaction score of the observation group with targeted anesthesia care measures was significantly higher than that of the control group (P < 0.05), see Table 4.

Table 4. Comparison of Patient Satisfaction Scores Between the Two Groups($\bar{x} \pm s$,points)

Group	Number of Cases	Satisfaction Score
Control Group	93	85.78±4.67
Observation Group	93	94.35±3.52
t		14.132
P		0.000

3.4 Comparison of the Incidence of Hypothermia During Anesthesia Resuscitation Between the Two Groups of Patients

The incidence of hypothermia during anesthesia resuscitation in the observation group with targeted anesthesia care measures was significantly lower than that in the control group (P < 0.05), see Table 5.

Table 5. Comparison of the Incidence of Hypothermia During Anesthesia Resuscitation in the Two Groups (n, %)

Group	Number of cases	Incidence of Hypothermia During Anesthesia Resuscitation
Control Group	93	18(19.35)
Observation Group	93	3(3.23)
t		12.078
P		0.001

4. Discussion

EA as one of the common complications during anesthesia resuscitation of general anesthesia patients, patients with EA due to their sympathetic nerves are overly excited, which will lead to excitement and agitation, resulting in involuntary activities, leading to the occurrence of unplanned postoperative anesthesia extubation and wound dehiscence and other related adverse events, and in severe cases, the collision of medical equipment and the personal injury of medical personnel might happen. Thus the occurrence of EA will not only bring physical harm to patients, but also impedes the implementation of anesthesia care, which seriously affects the recovery of patients, and also increases the burden of medical care (Yu L, Wang B, Huang L, et al., 2024; Aldwikat R K, Manias E, Holmes A C, et al., 2023; Yang K L, Detroyer E, Van Grootven B, et al., 2023). In recent years, more and more researchers have strengthened the study on the influencing factors related to EA, and related studies have concluded that the occurrence of EA has a close relationship with the patient's age, insufficient analgesia, post-operative hypothermia after anesthesia, and sleep disorders and other factors (Cao L, Ren Y, Wen F, et al., 2024; Wang C, Tan B, Qian Q., 2023). And as aging continues to deepen, the increase in the number of elderly surgical patients also brings great challenges to anesthesia care. For the prevention and management of EA, nurse anesthetists play an irreplaceable role in the prevention and management of patients in the peri-operative period (Zhou C, Qu X, Wang L, et al., 2023). In conclusion, this study applied targeted anesthesia nursing interventions to the management of EA in elderly patients and achieved good results.

Relevant studies have pointed out that the occurrence of EA has an important relationship with the pre-operative psychological state of patients, especially the pre-operative tension and anxiety of patients may be a pre-disposing factor for EA after surgery. Therefore, in this study, when implementing targeted anesthesia care interventions for patients in the observation group, it was emphasized that the pre-operative visit should strengthen patient's disease knowledge and the anesthesia process, so as to promote the patient's understanding of the

process of surgical anesthesia and to alleviate the pre-disposing factors for the occurrence of post-operative EA in the patient. Some studies have pointed out that the improvement of sleep quality can effectively reduce the incidence of post-operative EA in patients, therefore the targeted anesthesia nursing interventions adopted in this study strengthened the use of sleep aids for patients in the pre-operative period. Although there are few research reports on the pre-operative use of melatonin to help surgical patients to improve the quality of sleep, however, in this study, after the use of sleep aids for the intervention of the observation group, the incidence of post-operative EA in the patients in the observation group was reduced to 1.2% in the pre-operative period, in which patients had a lower incidence of post-operative EA than the control group patients. In this study, we implemented post-operative warming measures for patients in the observation group, so that the post-operative hypothermia rate of patients in the observation group was significantly lower than that of the control group, and the incidence of post-operative EA and related complications in patients in the observation group was significantly lower than that of the control group, which is also consistent with the study of Zhuang H et al (Zhuang H, Li W, Xue X, et al., 2024). Some scholars believe that opioids and nonsteroidal drugs can relieve the stress reaction that occurs in patients after surgery, thus reducing the chance of EA in patients after surgery and avoiding the occurrence of unexpected events such as bleeding, cardiovascular events, gastrointestinal bleeding and other events in patients after surgery (Ristescu A I, Pintilie G, Moscalu M, et al., 2021; Cao L, Ren Y, Wen F, et al., 2024). In this study, by adopting a multi-modal analgesic mode for the patients in the observation group, it alleviated the incidence rate of EA in patients and related adverse events. In addition, by adopting a multi-modal analgesic mode for the observation group, the incidence of EA and related adverse events were reduced, which is consistent with the above scholars' studies. At the same time, the anesthesia nurses also pacified the patients' psychology by means of arousal nursing, thus reducing the incidence of EA and improving the patients' satisfaction in this study.

5. Conclusion

In this study, by using targeted anesthesia nursing interventions for elderly patients after general anesthesia, we were able to effectively reduce the incidence of post-operative EA, the incidence of EA-related adverse events and the rate of hypothermia during the resuscitation period in elderly patients, which led to an increase in the satisfaction of the patients. However, there are also shortcomings in this study in that cognitive impairment was not assessed for the elderly patients prior to the surgery. In the future, we will consider this factor in our work and research. In conclusion, targeted anesthesia nursing interventions have a positive effect on improving the EA status of elderly general anesthesia post-operative patients, which is worthy of clinical application and promotion.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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