

Anesthetic Effect of Sufentanil Combined with Remifentanil in Patients Undergoing Radical Gastrectomy

Jianyue Wang*

Department of Anesthesiology, Binzhou People's Hospital, No.515 Huanghe 7 Road, Binzhou 256610, Shandong Province, China

*Corresponding author: Jianyue Wang, sdbzwjy2021@163.com

Abstract: *Objective:* To explore and analyze the anesthetic effect of sufentanil combined with remifentanil in patients undergoing radical gastrectomy for gastric cancer. *Methods:* In this study, 100 patients receiving radical gastrectomy for gastric cancer in our hospital were selected as the research subjects, and the period from June 2019 to February 2021 was divided into different anesthesia regimens. Fifty patients receiving remifentanil anesthesia were used as the control group, and 50 patients receiving remifentanil combined with sufentanil anesthesia were used as the research group. The anesthetic effect of the two groups of patients was analyzed and compared. *Results:* The HR and MAP of the study group at different time after intubation were lower than those of the control group ($P<0.05$). The changes of HR and MAP before and after intubation in two groups were significant compared with those before intubation ($P<0.05$). The postoperative VAS score of the study group was significantly better than that of the control group ($P<0.05$). *Conclusions:* In radical gastrectomy for gastric cancer, the choice of sufentanil and remifentanil as the anesthesia scheme can effectively stabilize the hemodynamics of patients, relieve the degree of postoperative pain, with obvious clinical value.

Keywords: Radical gastrectomy; Remifentanil; Sufentanil; Hemodynamics

Publication date: July 2021; **Online publication:** July 31, 2021

1. Introduction

In radical gastrectomy, patients not only need to feel no pain, but also need to have stable vital signs. As a result, patients often opt for general anesthesia, but patients under general anesthesia feel pain during surgery, but there is severe pain after surgery. Therefore, the selection of analgesic drugs is very critical, currently commonly used analgesic drugs are sufentanil and remifentanil ^[1]. Remifentanil works in a short period of time and requires continuous intravenous pumping. After surgery, patients may experience pain for a short period of time, which may affect the outcome. Sufentanil has attracted wide attention because of its long analgesic time and strong curative effect ^[2]. In this study, the anesthesia effect of sufentanil combined with remifentanil in patients undergoing radical gastrectomy was investigated and studied.

2. Materials and methods

2.1. General information

A total of 100 patients receiving radical gastrectomy for gastric cancer in our hospital from June 2019 to February 2021 were selected as the research subjects, and the patients were grouped according to different anesthesia regimens. In the study group, there were 50 patients, including 24 males and 26 females, with an average age of (59.26 ± 5.36) years old. In control group, there were 50 patients, including 27 males and 23 females, with an average age of (59.27 ± 5.41) years. Before participating in the study, patients need to

conduct basic data registration and data statistics, and the result is $P > 0.05$ before starting the study. Patients provided in-person signed informed consent for the study.

2.2. Research methods

Before surgery, patients in both groups were connected to the monitor, monitored by ECG, and routine venous access was established to monitor their blood pressure.

Control group received general anesthesia of remifentanyl: anesthesia induction, intravenous infusion of midazolam (National drug approval: H10980025) at a dose of 0.03mg/kg, and propofol (national drug approval:H20143253), initially at a target concentration of 2 μ g/ mL, then increased the concentration to 5 μ g/ mL, intravenous infusion of 0.3 μ g/kg remifentanyl (National drug approval : H20030197), and intravenous infusion of cisatracurium (National drug approval :H20183042) at a dose of 0.5mg/kg and was intubated after muscle relaxation was determined. Anesthesia was maintained with 4 μ g/ mL propofol, 4ng/ mL remifentanyl, and intermittent addition of 0.2mg/kg cisatracurium. An analgesic pump was used during suture.

Patients in the study group received sufentanil in line with remifentanyl general anesthesia: anesthesia induction, intravenous midazolam at 0.03mg/kg, initial target concentration of propofol at 2 μ g/ mL, then increased the concentration to 5 μ g/ mL, intravenous sufentanil (National drug approval:H20054171) at a dose of 0.3 μ g/kg and intravenous infusion of cisatracurium at 0.5 mg/kg and intubated after muscle relaxation was determined. Anesthesia was maintained with 4 μ g/ mL propofol, 4ng/ mL remifentanyl, and intermittent supplementation with 0.2 mg/kg cisatracurium. An analgesic pump was used during suture.

2.3. Research Indicators

The hemodynamic indexes of the two groups at different time points were detected and compared, respectively, before anesthesia, before intubation, 1min after intubation, 1min and 5min after extubation [3]. Visual analogue pain scale was used to evaluate and compare the pain degree at 6h, 12h and 24h after surgery between the two groups [4].

2.4. Statistical analysis

Statistical software SPSS 22.2 was selected as the data processing tool, in which the counting data was expressed as (%), and the test was X^2 calculation. The measurement data was expressed as ($\bar{x} \pm s$), and the test was calculated as t , $P < 0.05$.

3. Results

3.1. Comparison of hemodynamics between the two groups at different time points

As shown in **Table 1.**, HR and MAP of patients in the study group at different time after intubation were lower than those in the control group ($P < 0.05$). The changes of HR and MAP before and after intubation in two groups were significant compared with those before intubation ($P < 0.05$).

3.2. Comparison of postoperative VAS scores between the two groups

As shown in **Table 2.**, postoperative VAS scores in the study group were significantly better than those in the control group ($P < 0.05$).

Table 1. Hemodynamic questionnaire of patients in two groups at different time points ($\bar{x} \pm s$)

Project	Before anesthesia	Before intubation	1 min after intubation	1 min after extubation	5 min after extubation
HR (b/min)					
Research Group (n=50)	77.59±14.23	67.25±2.16 ^a	86.26±14.32 ^{ab}	91.26±13.24 ^{ab}	81.26±12.25 ^{ab}
Control group (n=50)	79.26±15.24	69.26±13.26 ^a	97.26±15.23 ^a	104.26±15.36 ^a	96.26±14.69 ^a
The MAP (mmHg)					
Research Group (n=50)	88.21±11.26	73.26±8.25 ^a	83.26±8.67 ^{ab}	88.72±10.26 ^{ab}	86.62±8.26 ^{ab}
Control group (n=50)	86.29±10.26	75.62±9.25 ^a	93.31±12.25 ^a	99.26±11.45 ^a	95.26±12.24 ^a

Note: Compared with before anesthesia, Pa < 0.05; Compared with control group, Pb<0.05.

Table 2. Questionnaire of postoperative VAS scores in the two groups ($\bar{x} \pm s$)

Project	6h	12h	24h
Research Group (n=50)	2.31±0.62	2.61±0.62	1.91±0.42
Control group (n=50)	5.53±1.56	4.81±1.15	3.51±1.12
T value	13.5635	11.9070	9.4584
P values	P < 0.05	P < 0.05	P < 0.05

4. Discussion

Gastric cancer is common clinically with high incidence, which seriously threatens the life safety of patients. At present, radical resection of gastric cancer can be used as the main method of treatment. However, due to the need for abdominal incision and wide scope of trauma, it is easy to cause severe pain stimulation, stress and change the hemodynamic indicators [5]. Clinical pain can be divided into three levels: mild, moderate and severe. Most of the pain in tumor surgery is severe, so preoperative anesthesia and analgesic drugs are very important [6].

Remifentanil is an opioid analgesic. Even if long-term infusion does not affect patients' respiration and postoperative recovery, studies have shown that remifentanil plays a faster role and has a short half-life, which makes it difficult to maintain long-term analgesic effect by infusion, leading to more obvious postoperative reactions than other opiates [7]. Sufentanil is an opioid receptor agonist, which is not easy to cause acute pain and hypersensitivity, and only requires small doses to achieve lasting analgesic effect. Moreover, Sufentanil is mainly metabolized outside the body by the liver and kidneys, so it is more popular in clinical use [8]. The results of this study showed that the HR and MAP of patients in the study group at different time after intubation were lower than those in the control group ($P < 0.05$). The changes of HR and MAP before and after intubation in two groups were significant compared with those before intubation ($P < 0.05$). The postoperative VAS score of the study group was significantly better than that of the control group ($P < 0.05$). Neuroendocrine disorders can cause neuroendocrine disorders due to traumatic and postoperative pain. The body produces large amounts of cytokines, catecholamines and stress responses [9]. Combined use of sufentanil and remifentanil can block pain nerves, help to maintain anesthesia effect,

maintain blood flow mechanism indicators, effectively inhibit harmful stimulation caused by endocrine reaction, reduce postoperative pain and allergy, and effectively inhibit stress response ^[10].

In conclusion, in radical gastrectomy for gastric cancer, choosing sufentanil combined with remifentanil as the anesthesia program can effectively stabilize the hemodynamics of patients, relieve the surgical stress response and postoperative pain degree of patients, with obvious clinical value.

Disclosure statement

The author declares no conflict of interest.

References

- [1] Yang Y, Li S, Xu F, 2019, Anesthetic Effect of Sufentanil Combined with Remifentanil in Radical Gastrectomy of Gastric Cancer and Improvement of Stress Response. *Progress in Modern General Surgery in China*, 23(4):316-318.
- [2] Cong H, 2017, Effects of Sufentanil Combined with Remifentanil on Anesthetic Effect and Stress Response in Patients Undergoing Radical Gastrectomy. *Chinese Journal of General Practice*, 15(7):1172-1174.
- [3] Feng Y, Li J, Wang H, et al., 2019, Anesthetic Effect of Propofol Combined with Remifentanil or Sevoflurane Anesthesia on Patients Undergoing Radical Gastrectomy. *Oncology letters*, 17(6).
- [4] Chen Yufen, Wang Xinhui. Effect of Remifentanil Combined with Propofol on Endoscopic Radical Gastrectomy [J]. *China General Practice*, 2018, 21(S2):105-106.
- [5] Zheng L, Zhao J, Zheng L, et al., 2020, Effect of Dexmedetomidine on Perioperative Stress Response and Immune Function in Patients with Tumors. *Technology in Cancer Research & Treatment*, 19(1):153.
- [6] Chen J, Li C, 2019, Effect of Remifentanil Combined with Epidural Anesthesia on Hemodynamics in Radical Gastrectomy. *Chinese Archives of General Surgery (Electronic Edition)*, 15(2): 120-124.
- [7] Cheng ZY, 2019, Effect of Sufentanil Combined with Remifentanil on Stress Response in Patients Undergoing Radical Gastrectomy. *Medical Equipment*, 32(3): 83-84.
- [8] Huang S, Wei SS, Anesthesiology DO, 2019, The Effect of Levobupivacaine Combined with Sufentanil in Superficial Cervical Plexus Block on the Dosage of General Anesthesia and Recovery Period in Thyroid Surgery. *World Latest Medicine Information*.
- [9] Cai S, Shen L, Sun H, 2019, Effects of Remifentanil and Sufentanil on Hemodynamics and Stress Levels in Patients Undergoing Radical Gastrectomy. *Chinese Journal of Clinical Oncology*, 26(08):920-924.
- [10] Zhang Y, Zuo Y, Yang Y, 2019, Effects of Remifentanil Combined with Sufentanil General Anesthesia on Stress Response, Immune Function and Hemodynamics in Elderly Patients Undergoing Abdominal Trauma Surgery. *Journal of Chengdu Medical College*, (4).