Journal of Clinical and Nursing Research

Research Article

Comparison of the Effect of Combined Cardiovascular Dexmedetomidine and Propofol in Minimally Invasive axillary Odor Surgery with Tumescent Anesthesia

Chunfei Xu, Xiaoying Gao*

Department of plastic surgery, People's hospital of shizhu tujia autonomous county, Chongqing, China

Abstract: ***Objective:*** The effects of combined dexmedetomidine hydrochloride and propofol in minimally invasive axillary odor surgery with tumescent anesthesia. ***Methods:*** A total of 46 patients underwent minimally invasive axillary odor surgery by tumescent anesthesia received in the hospital from May 2017 to January 2019 were divided into observation group (23 cases) and control group (23 cases) according to the random number table method. The control group used propofol, and the observation group underwent minimally invasive axillary odor combined with dexmedetomidine hydrochloride by tumescent anesthesia. The changes of arterial blood pressure (MAP), heart rate (HR) and postoperative complications before and after anesthesia were compared and analyzed between the two groups. ***Results:*** After anesthesia, MAP and HR in both groups were lower than before anesthesia, and the observation group was lower than the control group, the difference was statistically significant (P<0.05). Compared with the control group, the postoperative complications were less in the observation group, but the difference was not statistically significant (P>0.05). ***Conclusion:*** Compared with the use of propofol, the effect of dexmedetomidine hydrochloride combined with minimally invasive axillary odor surgery by tumescent anesthesia is more obvious, and the postoperative recovery is faster with fewer complications.

Keywords: Tumescent anesthesia; Minimally invasive axillary odor surgery; Dexmedetomidine hydrochloride; Propofol

Publication date: March, 2020

Publication online: 31 March, 2020

***Corresponding author:** Xiaoying Gao, gxy2008gxy@163.com

1 Introduction

Axillary odor or body odor, it is because the sweat component secreted by the sweat glands under the dermis of the armpit is more than that of normal people. It is resulted by the decomposition of bacteria on the surface of the skin. Axillary odor is a genetic predisposition that occurs more frequently in young adults. There are many methods for treating axillary odor, such as topical rubbing of drugs, although it is simple and easy to implement, but the effect is not long-lasting and it cannot permanently eliminate axillary odor. Although the local drug injection has minimal injury, simple and fast, it is easy to recur. High frequency or laser is prone to miss the large sweat glands at the site thus the axillary odor cannot be eradicated. Traditional surgical procedures have more prominent scars after healing, which affects the appearance and aggravates the psychological stress in patients[1-3]. Patients undergoing minimally invasive axillary odor surgery with tumescent anesthesia can quickly obtain good deodorization effects. Dexmedetomidine hydrochloride has analgesic effect and can alleviate patients' discomfort during the operation while propofol is suitable for the induction and maintenance of general anesthesia[4]. This study mainly compared the effects of dexmedetomidine hydrochloride and propofol on anesthesia in patients undergoing minimally invasive axillary odor surgery with tumescent anesthesia. The report results are shown below.

2 Materials and methods

2.1 General information

Forty-six patients with minimally invasive axillary odor by tumescent anesthesia received in the hospital from May 2017 to January 2019 were divided into two groups according to the random number table method, with 23 patients in each group. There were 6 males and 17 females in the observation group; aged 25 – 50 years, mean age (37.51 ± 2.32) years; weight 45 – 67 kg, mean weight (56.49 ± 3.47) kg. The control group included 9 males and 14 females, aged 26 – 51 years, with an average age of (38.52 ± 2.40) years; body weight was 44 – 66 kg, and the average weight was (55.52 ± 3.49) kg. The exclusion criteria including complicated hypertension, heart failure, coagulopathy, bronchial asthma, peptic ulcer and other serious diseases. Those who have recently received opioid therapy, have mental disorders and are allergic to non-steroidal anti-inflammatory drugs are refused to participate in this study. There was no difference in the information of the two groups (P>0.05), which can be compared. This study was approved by the Medical Ethics Committee.

2.2 Method

The control group received propofol (manufactured: Jiangxi Enhua Pharmaceutical Co., Ltd., National Pharmaceutical Standard H20123138, specification: 20 ml: 0.2 g) for continuous intravenous pumping, and the speed was controlled to 3 mg per kg per hour. Meanwhile, the observation group underwent minimally invasive axillary odor with tumescent anesthesia combined with dexmedetomidine hydrochloride. The specific measures are as follows: Take the patient in a supine position, outstretch his both arms, shave the armpit hair clean, establish a venous channel, and inject 0.3 μg/kg dexmedetomidine hydrochloride (manufactured: Yangzijiang Pharmaceutical Group Co., Ltd., National Pharmaceutical Standard H20183220, specifications: 1 ml: 0.1 mg) for continuous intravenous pumping and the speed was controlled to 0.3 μg per kg per hour. The surgical area was marked 0.5 cm along the axillary hair edge with nail polish, and the marking line was fixed with 3% iodine. The marked position was routinely disinfected and clothed with iodophor. The tumescent anesthesia solution was made from 30 ml of 2% lidocaine, 0.5 ml of 1% epinephrine, 500 ml of normal saline and 5 ml of NaHCO3 was given to the patient's surgical marker line and the dose was 150 ml. Make a 0.3 - 0.5 cm horizontal incision on the inside of the patient's upper arm with a No. 11 labelled blade at the tip of the marked area, and then insert a No. 4 liposuction needle into the marked area from the incision, and adjust the negative pressure to 0.08 - 0.1 kPa before suctioning. In order to avoid or prevent damage to deep nerves or blood vessels, the needle holes for liposuction should be directed at the skin. When the skin in the marked area becomes thin, the liposuction needle should be pressed and still sucked. Rinse the residue left by the syringe on the swollen fluid injected into the cavity to ensure that the cavity is clean, and then use gauze to squeeze out the remaining cavity. Finally, the incision was sutured with a 7/0 silk thread, gauze was stuffed under the armpit, and a self-adhesive elastic bandage was bandaged by applying pressure to fix it. Take antibiotics for 1 week (no dressing change required) and remove the thread after 1 week. Followed up for 6 months.

2.3 Observation indicators

(1)Welch AIIyn, inc vital sign monitor (USA, model: 530TP) was used to measure changes in arterial pressure (MAP and heart rate (HR). (2)Complications: A comparative analysis of postoperative complications in two groups, including scar hyperplasia, wound infection and subcutaneous hematoma.

2.4 Statistical methods

SPSS 18.0 software was used for data processing to represent measurement data. Independent sample t-test was used between groups while paired sample t-test was used in the group. Count data was expressed as percentages and χ^2 test was used. P<0.05 was considered statistically significant.

3 Results

3.1 Anesthetic effect

There was no significant difference in anesthetic effect between the two groups (P>0.05). After anesthesia, MAP and HR in the two groups were lower than before, and the observation group was lower than the control group. The difference was statistically significant (P<0.05). As shown in Table 1.

Table 1. Comparison of anesthetic effects between two groups ($\bar{x} \pm s$)

Time	Group	MAP (mmHg)	HR (times/min)
Before anesthesia	Control group (n=23)	96.12 ± 8.23	87.34 ± 9.16
	Observation group (n=23)	97.26 ± 8.25	87.40 ± 9.18
	t	0.469	0.022
	P	0.641	0.982
After anesthesia	Control group (n=23)	86.51 ± 8.17*	68.33 ± 8.21*
	Observation group (n=23)	81.25 ± 8.13*	63.20 ± 8.07*
	t	2.189	2.137
	P	0.034	0.038

Note: Compared with this group before anesthesia: [a]$P<0.05$

3.2 Complications

The total incidence of postoperative complications in the observation group was lower than that in the control group, but the difference was not statistically significant ($P>0.05$). See Table 2.

Table 2. Comparison of the incidence of postoperative complications between the two groups n (%)

Group	Scar hyperplasia	Wound infection	Subcutaneous hematoma	Total incidence
Control group (n=23)	2 (8.70)	3 (13.04)	1 (4.35)	6 (26.09)
Observation group (n=23)	0	1 (4.35)	0	1 (4.35)
χ^2				2.696
P				0.040

4 Discussion

Axillary odor is a kind of sweaty glandular odor, which mainly occurs in areas such as the axillary, umbilical, and areola. Among them, the armpits are the most typical, with a pungent smell. The incidence of stinky sweat signs varies according to individuals and races. There are no significant differences in climate and season. It is more common in women and are closely related to heredity, so they will still be passed on to the next generation after surgery[5].

Propofol is a widely used intravenous anesthetic in clinical anesthesia, which has the characteristics of powerful, fast onset, and wake-up fast. After intravenous injection of propofol for 15s, the patient will fall asleep, and within 15 minutes of stopping propofol, the patient will wake up. Although propofol is a powerful intravenous anesthetic with rapid onset and rapid metabolism, rapid bolus injection of propofol during operation is prone to apnea and lower blood pressure. Thus, it would lead to complications such as scar hyperplasia, wound infection, and subcutaneous hematoma after surgery[6]. Therefore, the clinical application of propofol requires the participation of rigorously trained and qualified anaesthesiologists to ensure patient safety. The mechanism of tumescent anaesthesia is that after injecting a certain amount of lidocaine and epinephrine anaesthesia solution under the skin, edema can be formed between various structures of the subcutaneous tissue, result in excessive pressure and compression of tiny blood vessels to cause occlusion which can reduce the amount of bleeding and drug absorption. When small nerve fibres are compressed, it will produce a better aesthetic effect. However, it should be noted that the tumescent anaesthesia of the axillary arm should be injected at a low concentration for mastering the plane and peeling. Moreover, the peeling plane should be located between the subcutaneous fat and the dermal basal layer. Too deep is not only difficult to cut off sebaceous gland ducts, but also easy to recur. Lastly, the fat under the skin flap should be thoroughly stripped. Dexmedetomidine hydrochloride injection is an α2-adrenergic receptor agonist developed by Abott (USA company) and Orion Pharma (Finland company), which has a stronger selectivity for central α2-adrenergic receptor activation. The dosage is small and the half-life is short[7]. Dexmedetomidine hydrochloride injection is an α2-adrenergic receptor agonist developed by Abott (USA) and Orion Pharma (Finland), which has a stronger selectivity for central α2-adrenergic receptor activation with a small dosage and short half-life[7]. In addition, the sedative drug also has anti-anxiety and anti-sympathetic suppression during the perioperative stress response which can reduce the amount of aesthetic drugs, and is conducive to maintaining stable

hemodynamics[8]. The results of this study show that after anaesthesia, the MAP and HR in the observation group were lower than those in the control group, and the postoperative complications were lower than those in the control group. This shows that the combination of dexmedetomidine hydrochloride in the minimally invasive axillary odor surgery with tumescent anaesthesia can completely destroy the sweat glands, lipid gland, sweat gland duct and other structures, which play a role in eradicating axillary odor. The combined scheme has the advantages of small incision, strong analgesia, no scars, and few complications, and provides an important reference for clinical practice.

In summary, compared with the use of propofol, the effect of dexmedetomidine hydrochloride combined with minimally invasive axillary odor surgery with tumescent anaesthesia is more obvious, and the postoperative recovery is faster with fewer complications, which is worth learning.

References

[1] Sun XF, Zheng YL, Jiang T, et al. Analysis of the evolution of the axillary odor technique [J]. Medicine and Philosophy, 2011, 32(9): 57-58.

[2] Fu JH. Sedation of dexmedetomidine-assisted general anesthesia and the effect of general anesthetics [J]. Contemporary Medicine, 2015, 4(22): 77-78.

[3] Chen XT, Liu JH, Qiu BS, et al. Practical skin histopathology [M]. Guangzhou: Guangdong Science and Technology Press, 1994: 9.

[4] Zhang JZ. Exploring the application value of propofol combined with sufentanil and flurbiprofen ester in plastic anesthesia [J]. China Medical Cosmetology, 2016, 6(6): 18-20.

[5] Li CH. Comparison of the effects of anesthesia with plastic surgery on dexmedetomidine hydrochloride and propofol[J]. Journal of Contemporary Medicine, 2018, 16(17): 120-121.

[6] Wu QC. Anesthetic effect of dexmedetomidine hydrochloride combined with remifentanil in orthopedic surgery [J]. Practical Clinical Journal of Integrated Traditional Chinese and Western Medicine, 2017, 17(6): 67-68.

[7] Feng AM, Lu XH, Li J, et al. Synergistic effect of dexmedetomidine and propofol during induction of anesthesia [J]. Journal of Clinical Anesthesiology, 2018, 34(5): 429-431.

[8] Sui JH, Liu XW, Deng XM, et al. Application of midazolam and propofol combined with sufentanil sober sedation in plastic surgery [J]. Chinese Journal of Plastic Surgery, 2015, 28(4): 278-281.