

Research on dezocine in peritoneal gynecology operation under the target organ effect

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Abstract: This paper was aimed to further analyze the concrete clinical efficacy of dezocine as an anesthetic for peritoneal gynecology operation and to offer a scientific guidance for future surgical treatments. This paper randomly selected 1000 peritoneal gynecology operation patients in 5 hospitals from January to December 2015 as research objects in the observation group, who were mainly applied with dezocine in operative anesthesia. By analyzing data of cases, it concluded efficacy characteristics of dezocine in various phases, and thus provide scientific guidance for future surgical treatments. Another 500 patients who were given with fentanyl as anesthetic in peritoneal gynecology operation were selected as research objects in the control group. We compared the two groups in aspects of index changes before and after operative anesthesia, VAS scores and haemodynamics changes in 2 hours of anesthesia. The results showed that, index changes occurred in both of groups after anesthesia, but patients in the observation group presented a more obvious efficacy with a significant difference ($P < 0.05$). Besides, adverse reactions in both of groups during the operation were basically comparative, so there was no significant difference ($P > 0.05$) or statistical value. This research demonstrated that dezocine, as an anaesthetic in gynecology operation, has a good therapeutic effect and value of wide application in clinical anesthesia.

Keywords: Target organ effect, dezocine; peritoneal operation, analgesic effect.

INTRODUCTION

Similar to the electronic gastroscope, peritoneoscope is an instrument provided with a miniature camera and peritoneal operation is performed by such a peritoneoscope and other related instruments (Hu *et al.*, 2012; Li *et al.*, 2014). To be specific, this operation uses the cold light source to supply lighting, inserts the peritoneoscope lens (with the diameter of 3~10mm) inside peritoneal, applies the digital photographic technology to transmit images shot by peritoneoscope lens to signal processing system via light-guide fibre, and displays on a special monitor on real-time (in fig. 1). Based on images displayed on monitor screen from different angles, doctors can make analysis and judgment on pathogenetic conditions and apply special peritoneal instruments to perform operations. With the development of medical science and technology, peritoneoscope has become an essential examination and treatment means for female infertility (Shen *et al.*, 2011; Wei, 2012; Tan *et al.*, 2013). As a minimally invasive surgery, peritoneal technique enables doctors to clearly see tissues and organs inside of pelvic and peritoneal, and thus to make a quick and clear diagnosis and perform necessary operations under the peritoneoscope (Yang, 2011). Hydrotubation can be performed under direct vision of peritoneoscope with a large volume of liquid instillation and good negotiation effect. Due to the short length of stay, safe operation and rapid recovery, performing neostomy at salpingian fimbria can eliminate ponding and adhesion at

fimbria and adhesion separation in pelvic, perform enucleation of ovarian chocolate cyst and operation of polycystic ovarian drilling, and minimize damages caused by other operations. Although non-invasive (see in fig. 2), a good anesthesia is required to control physical indications within reasonable bounds.

Fentanyl is often used in clinical gynecological operation (fig. 3). Fentanyl is an opioid receptor agonist, a strongly effective analgetic in anaesthesia, of which the pharmacological effect is similar to that of morphine (Ye, 2015). The related researches indicate that the analgesic effect of fentanyl is about 80 times of morphine. It needs little to take effect (after 1 minute), but does not last long (reaching peak after 4 minutes and maintaining for 30 minutes). In case of intramuscular injection, it takes effect approximately after 7 minutes and maintains for 1~2 hours. Due to its weaker respiration inhibition, fentanyl has fewer adverse reactions than morphine (Li, 2014). However, numerous adverse reactions may occur when using fentanyl in gynecological anaesthetic operations, like nausea and vomiting, blurred vision, itching and euphoria. Thus, a safer treatment means for gynecology operation patients is necessitated.

As κ receptor agonist and μ receptor antagonist, dezocine has a stronger analgesic effect than that of pentazocine (fig. 4). Opioid agents are basic drugs for postoperative analgesia, but its analgesic and side effect are receptor dependent. The motorial analgesic effect may be insufficient if the static analgesic effect is reached and

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once a good motorial analgesic effect is reached up, the static analgesic effect may cause side effects like respiratory depression. Mainly distributed in κ receptor of cerebral, brainstem and spinal cord, opi-oid receptor mixed agonist reduces or eliminates the central sensitization after injuries to achieve the analgesic effect by preventing noxious stimulus induced by central nervous impulse or reducing excitability of nervous centralis ahead of time. Dezocine is a benzomorphan derivative, of which the small addiction is primarily caused by the receptor's agonistic and antagonistic effect. Due to its strong analgesic effect, it can be rapidly absorbed via the subcutaneous and intramuscular injection: 30 minutes for intramuscular injection to take effect and 15 minutes for intravenous injection to take effect. The analgesic effect of 5~10mg of dezocine amounts to that of 50~100mg of pethidine, wherein $t_{1/2}$ refers to 2.2~2.8 hours. For liver metabolism, over 80% can be excreted in the urine within 8 hours after the drug was administered. Hence, dezocine can be used for postoperative, visceral and cancerous pains.

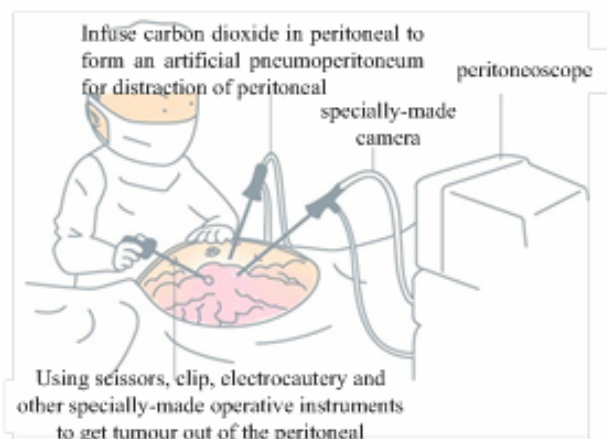


Fig. 1: Peritoneal technique.

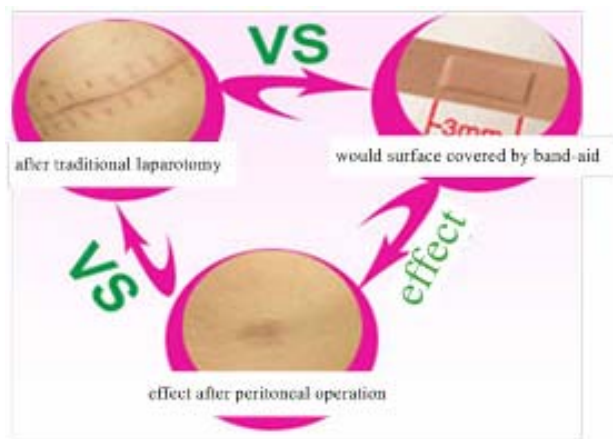


Fig. 2: Peritoneal operation is non-invasive.

Therefore, this paper made a thorough analysis on clinical anesthetic effect of dezocine in peritoneal anesthesia operations, with concrete information are shown as below.

MATERIALS AND METHODS

General information

From January to December 2015, this paper randomly selected 500 patients from 5 hospitals as research objects in observation group, who had been applied with dezocine in peritoneal gynecology operation. While, another 500 patients who had been given with fentanyl in peritoneal gynecology were selected as research objects in the control group. The patients in the observation group were averaged at (25.92 4.21) years old and (67.95 5.64) kg, while the patients in the control group were averaged at (25.46 3.65) years old and (68.66 5.88) kg. This paper excluded patients with heart, lung, liver, kidney, and other functional disturbances before, or history of chronic pain or drug abuse or psychiatric disorder, or recently administrating sedative, antipruritic or antanacathartic. All patients signed the informed consent to agree therapeutic regimens in the operation before any performance. By comparing general information of patients in two groups, this paper found that there was no statistical difference.

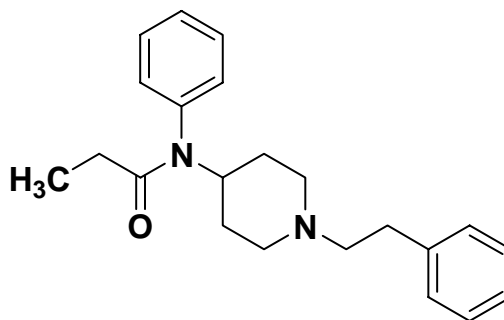


Fig. 3: Structure of Fentanyl

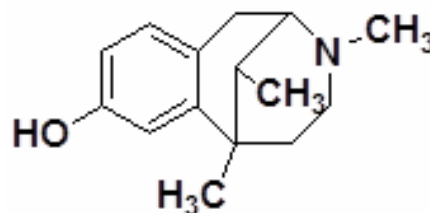


Fig. 4: Drug structure of dezocine.

Anaesthesia method

This paper abandoned any sedative and analgesic drug before the anesthesia, but adopted upper-limb venous transfusion to monitor the electrocardiogram, variables of blood pressure, saturation of pulse oximetry and bispectral index of patients. The general anesthesia by combined intravenous inhalation was practiced in all patients. Approved by the ethics committee of the hospital, all patients signed informed consent before surgery.

Fentanyl was used for operative anesthesia of patients in control group, wherein propofol, midazolam and vecuronium were adopted for 5-minute anesthesia induction. After that, this paper performed the tracheal

intubation and used sevoflurane, propofol and remifentanyl for maintenance of anesthesia. In a similar way, dezocine was used for patients in observation group for operative anesthesia based on these conditions.

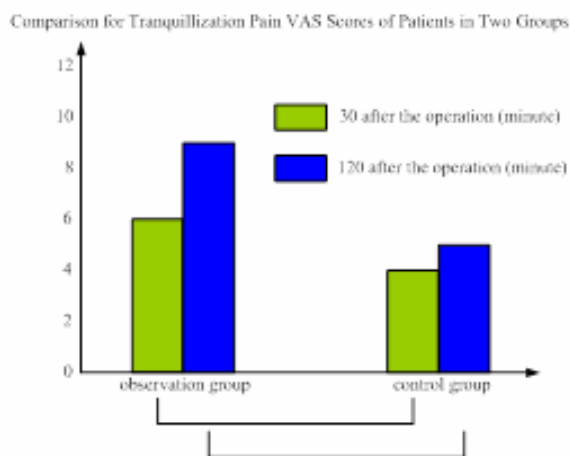


Fig. 5: Comparison for tranquillization pain vas scores of patients in two groups.

Observation method

A multifunctional ECG monitor was used to monitor hemodynamic changes before the anesthesia, 5 minutes after the administration of drug, at the moment of tracheal intubation, after carbon dioxide pneumoperitoneum in peritoneoscope and at the moment of tracheal extubation. Besides, VAS scores were also observed when patients were conscious, at the moment of tracheal extubation and 30 min after the operation.

STATISTICAL ANALYSIS

This paper adopted SPSS19.0 statistical package for statistical analysis. Measurement data were described by mean and standard difference ($\bar{X} \pm s$). The measurement data were analyzed by single factor variance, while enumeration data were represented by case number and percentage, and tested by χ^2 with test level of $\alpha = 0.05$.

RESULTS

There was no statistical significance between the two groups in general information (including age, height, weight and sick time) ($P > 0.05$) (table 1). There was a statistical significance between the two groups during the operation (including operation time, bleeding volume and volume of fluid input) ($P < 0.05$) (table 2).

There was no statistical significance between the two groups after the operation (including recover time of spontaneous breathe, eye open time and extubation time) (table 3).

VAS score of tranquillization pain: the score in the control group is much higher than the observation group after 30 minutes and half an hour of the operation. The difference has no statistical significance (table 4 and fig. 5).

There was no respiratory depression, dysuresia or adverse reactions occurring on patients in neither of groups. Hence, there existed statistical significance of difference between two groups ($P < 0.05$), $\chi^2 = 6.255$, $P = 0.033$ (table 5).

DISCUSSION

Dezocine pharmacokinetics demonstrated that, dezocine could take effect within 15 minutes after the intravenous injection with $t_{1/2}$ as 2.2-2.8 hours and over 80% could be excreted in the urine within 8 hours after the drug was administered in liver metabolism. The analgesic effect of dezocine is equal to that of morphine. Furthermore, dezocine have advantages that morphine, butorphanol and other opioid agents do not have in moderate pain treatments (Zhang *et al.*, 2015). To be specific, it has strong analgesic effect, rapid absorption and distribution, large volume, slow elimination, fast onset of action, weak agonistic action μ receptor and activity on δ opi-oid receptor and low possibility of respiratory depression and addiction (Li, 2014). Besides, it would not cause any irritability or typical dependence on μ receptor, which can remit the gastrointestinal smooth muscle and reduce the possibility of nausea and vomiting. Based on these advantages, this operation achieved an anesthetic effect on patients in the observation group and no obvious anomaly of indices occurred. Some patients suffered from adverse reactions such as nausea and vomiting but not to a serious degree and after an immediate care, these reactions were all clearly improved and basically eliminated. It is evident that applying dezocine to clinical anesthesia has a good effect of analgesia and prevention of adverse reactions. Literature reports indicated that, both 5mg and 10mg of dezocine exert a satisfied analgesic effect in moderate pain treatment, but the latter has a better effect (Zheng *et al.*, 2012). Hence, most hospitals used 10mg of dezocine as the test dose of anesthesia during the period of this research.

CONCLUSION

To sum up, dezocine was proved to have an analgesic effect, especially using before the operation. Without prejudice to an anesthesia recovery, it is not only safe and has few adverse reactions, but also can effectively relieve postoperative wound pain. Due to its safe postoperative analgesic effect, it can effectively improve the treatment satisfaction of gynecologic patients and can be widely applied.

Table 1: General Information of Patients in Two Groups

group	case number	age (years old)	height (cm)	weight (kg)	sick time (day)
observation group	500	25.92±4.21	162.32±4.32	67.95±5.64	36.45±1.52
control group	500	25.46±3.65	162.45±4.34	68.66±5.88	36.56±1.23
t		1.846	0.476	1.949	1.258
P		0.065	0.635	0.052	0.209

Table 2: Comparison for Intraoperative Situations of Patients in Two Groups

group	case number	operation period (min)	bleeding volume (ml)	volume of fluid input (ml)
observation group	500	30.15±6.32	142.53±56.32	520.69±65.28
control group	500	34.86±6.55	163.98±55.33	560.88±64.99
t		11.571	6.075	9.756
P		0.014	0.027	0.057

Table 3: Comparison for Postoperative Situations of Patients in Two Groups

group	case number	recover time of spontaneous breathe (minute)	eye open time (minute)	extubation time (minute)
observation group	500	23.15±3.32	32.53±6.30	40.59±5.28
control group	500	24.86±5.55	33.58±5.35	41.68±4.99
t		5.912	2.841	3.355
P		0.069	0.005	0.017

Table 4: Comparison for VAS Scores of Patients in Two Groups

group	case number	30 after the operation (minute)	120 after the operation (minute)
observation group	500	6.15±1.32	3.93±1.30
control group	500	8.86±1.55	5.28±1.35
t		29.764	16.107
P		0.053	0.019

Table 5: Comparison for Adverse Reactions on Patients in Two Groups

group	nausea and vomiting (case)	Headache (case)	drowsiness, dizziness (case)	Dysuresia (case)	respiratory depression (case)	Total [case, (%)]
observation group	4	3	2	0	0	9(1.8)
control group	15	9	8	0	0	32(6.4)
X2						13.454
P						0.027

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