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# Study on the Clinical Effect of Dezocine and Remifentanil Combined with Propofol in Anesthesia for Painless Abortion

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**Abstract:** ***Objective:*** To investigate the anesthetic effect of dezocine and remifentanil combined with propofol in painless artificial abortion. Methods: 90 cases in total of painless induced abortion in our hospital from May 2017 to May 2020 were retrospectively analyzed, 29 cases of propofol anesthesia (group A), 29 cases of dezocine combined with propofol anesthesia (group B), and 32 cases of remifentanil combined with propofol anesthesia (group C) were compared the anesthesia situation. ***Results:*** Compared with the cases in group A, the incidence of pain, body movement and $SPO_2$<90% at the injection site were lower in group B and group C, the use of propofol was reduced, and the VAS scores were lower when the patients begin to awake, and the efficiency was higher than that in group A($P$<0.05); there was no statistic difference in the changes of SBP, DBP and HR index data in the operation time, postoperative awake time, and preoperative, intraoperative and postoperative time points of the three groups($P$>0.05). ***Conclusion:*** Dezocine and remifentanil combined with propofol for painless artificial abortion anesthesia has more significant effect than propofol anesthesia alone, which can relieve patients' pain and reduce the chance of respiratory depression.

**Keywords:** Dezocine; Remifentanil; Propofol; Abortion; Anesthesia

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In recent years, painless induced abortion has been widely promoted and applied due to its advantages of short operation time, no need for hospitalization, and discharge after surgery. However, painless induced abortion has higher requirements for the use of anesthetic drugs, and the drugs with high safety and well-control are of great significance for the smooth and successful operation[1]. In the past, propofol was used alone for anesthesia, and the analgesic effect was not very satisfying, meantime, it involves a large dose and easily accompany with adverse reactions, so it's necessary to combine it with other anesthetic drugs. In order to find a better anesthesia use plan, the cases of artificial abortion in our hospital that have been treated with different anesthesia plans in the past three years are retrospectively analyzed in this article, and the relevant data on the anesthesia effect are summarized and compared as follows.

## 1 Data sources and methods

### 1.1 Data analysis

From May 2017 to May 2020, 90 cases in total of painless artificial abortion were treated in our hospital, including 29 cases of propofol anesthesia (group A), 29 cases of dezocine combined with propofol anesthesia (group B), Swiss Fentanyl combined with propofol was anesthetized in 32 cases (group C). Details: The ages of Group A women were from 24 to 36 years old, with an average of 30.1 ± 2.4 years old, weighted from 42 to 60 kg, the average was 51.2 ± 4.4 kg, pregnancy time were 35 to 60 days, with an average of 57.6 ± 4.5 days. The women in Group B were from 22 to 35 years old, with an average of 29.7 ± 2.1 years old, weighed from 40 to 59 kg, with an average of 50.3 ± 4.2 kg, and had a gestation period of 35 to 62 days, with an average of 58.1 ± 4.7 days. Besides, the women in group C were

from 21 to 36 years old, with an average of 29.7 ± 2.2 years old, weighed from 42 to 61 kg, with an average of 51.5 ± 4.5 kg, and had a gestation period of 34 to 61 days, with an average of 57.2 ± 4.1 days. The data values of the cases in three groups are comparable ($P$>0.05).

### 1.2 Anesthesia method

The patient was forbidden to eat and drink for 6 to 8 hours before the operation. The patient was created a venous channel in the forearm and wore a mask to inhale oxygen. The flow rate was controlled at 5L per minute. The patient was selected for the lithotomy position to have operation and the disinfectant towel was routinely laid. During the operation, if the patient had a body movement, then gave the intravenous injection of 0.5mg / kg propofol. The patient's vital signs such as systolic blood pressure, diastolic blood pressure and heart rate were monitored throughout the operation and demanded to stay for 2 hours in the hospital after operation.

Group A: NaCl with concentration of 0.9% and dose of 2 ml, slowly intravenous injection of propofol until the eyelash reflex disappeared, and then started the surgery, continued injection of propofol 8 mg/kg/h until the negative pressure suction was done.

Group B: Diluted dezocine (measured 0.05 mg/kg) to 2 ml according to the individual situation of the patient, injected intravenously and the propofol at the same time (the usage was the same as in group A).

Group C: Remifentanil (1.5 ug/ g) was intravenously infused according to the specific conditions of the patient, and the propofol at the same time (the usage and dosage were the same as in group A).

### 1.3 Anesthesia index

Compare the anesthesia effect indexes of the patients in three groups, such as awake time, operation time, pain at the injection site, body movement, propofol dosage, and visual analogue score (VAS)[2] during recovery; compared the vital signs of cases during pre-operation(T0), at the end of induction (T1), at the time of dilation (T2), at the end of surgery (T3), at the time of arousal (T4). Evaluation of anesthesia effect[3]: (1) showing quiet without limb movement during operation is markedly effective; (2) showing slight limb movement without any influence on the operation is effective; (3) showing physical activity affecting the operation is invalid.

### 1.4 Statistical treatment

SPSS 25.0 statistical tool was used for data analysis. The measurement value was expressed by mean ± standard deviation with the method of t test. The count value was expressed in the form of percentage with the test method of chi-square test. The result value $P$<0.05 was considered as a criterion for determining significance.

## 2 Results

### 2.1 Comparison of the incidence of pain, body movement and $SPO_2$<90% in the injection site in the three groups

Compared with the cases in group A, the incidence of pain, body movement and SP $O_2$<90% at the injection site were lower in groups B and C ($P$<0.05). See Table 1.

**Table 1.** Comparison of the injection site pain, body movement and $SPO_2$<90% incidence rate among the three groups [$n$ (%)]

| Group | Cases | Injection site pain | Body movement | $SPO_2$<90% |
|---|---|---|---|---|
| Group A | 29 | 18(62.1) | 16(55.2) | 11(37.9) |
| Group B | 29 | 4(13.8) | 5(17.2) | 3(10.3) |
| Group C | 32 | 5(15.6) | 6(18.8) | 4(12.5) |
| $\chi^2$ | | 20.978 | 12.927 | 8.642 |
| $P$ | | <0.05 | <0.05 | <0.05 |

### 2.2 Comparison of the operation time, postoperative awake time, propofol dosage and VAS score in the three groups

The difference in operation time and postoperative awake time among the three groups was not significant ($P$>0.05); compared with group A, the use of propofol was reduced in group B and group C, and the VAS scores were lower when the patient was recovered ($P$<0.05). See Table 2.

**Table 2.** Comparison of the operation time, wakefulness time and propofol dosage ($\bar{x} \pm s$) in the three groups

| Group | operation time (min) | wakefulness time (min) | propofol dosage (mg) | VAS scores when awake (point) |
|---|---|---|---|---|
| Group A | 5.73±0.62 | 4.53±0.36 | 165.54±9.82 | 4.21±0.35 |
| Group B | 5.86±0.73 | 4.37±0.25 | 127.89±8.47 | 2.72±0.18 |
| Group C | 5.82±0.64 | 4.64±0.42 | 127.31±8.16 | 2.61±0.12 |
| *P* | >0.05 | >0.05 | <0.05 | <0.05 |

### 2.3 Comparison of the anesthesia effectiveness in three groups

The effective rate of anesthesia in group B and group C is higher than that in group A ($P$<0.05), See Table 3.

**Table 3.** Comparison of the anesthesia effectiveness among the three groups [*n*(%)]

| Group | Cases | Markedly effective | Effective | Ineffective | Total effective |
|---|---|---|---|---|---|
| Group B | 29 | 26(89.7) | 3(10.3) | 0(0.0) | 29(100.0) |
| Group C | 32 | 29(90.6) | 3(9.4) | 0(0.0) | 32(100.0) |
| $\chi^2$ | | | | | 6.360 |
| *P* | | | | | <0.05 |

### 2.4 Comparison of SBP, DBP and HR index changes at different time among the three groups

There was no statistical difference in SBP, DBP and HR index data before, during and after operation among the three groups ($P$>0.05). See Table 4.

**Table 4.** Comparison of SBP, DBP, HR index changes at different time point among the three groups ($\bar{x} \pm s$)

| Group | Point in time | SBP (mmHg) | DBP (mmHg) | HR (times/min) |
|---|---|---|---|---|
| Group A | T0 | 119.3±7.52 | 68.34±3.15 | 78±6 |
| | T1 | 107.37±6.49 | 61.32±2.82 | 72±5 |
| | T2 | 105.28±5.61 | 61.99±2.78 | 71±5 |
| | T3 | 117.76±6.28 | 65.46±4.23 | 77±8 |
| | T4 | 117.84±6.31 | 65.44±3.15 | 77±8 |
| *Group B* | T0 | 119.61±7.53 | 70.26±3.51 | 81±8 |
| | T1 | 106.33±6.48 | 63.22±2.87 | 71±6 |
| | T2 | 107.25±6.13 | 62.25±2.71 | 70±5 |
| | T3 | 117.55±6.08 | 66.26±3.47 | 78±6 |
| | T4 | 117.02±6.01 | 68.11±3.52 | 78±6 |
| *Group C* | T0 | 119.28±7.34 | 71.20±5.74 | 76±5 |
| | T1 | 107.92±6.28 | 63.84±3.76 | 71±4 |
| | T2 | 106.51±5.76 | 62.81±3.14 | 70±4 |
| | T3 | 117.46±6.82 | 66.27±3.75 | 80±8 |
| | T4 | 117.91±6.92 | 68.81±4.33 | 76±4 |

## 3 Discussion

Abortion refers to the pregnancy time is not more than 12 weeks, and needs to end pregnancy in time due to accidents, illegal pregnancy or disease and other factors[4]. Painless abortion is an artificial abortion operation under general anesthesia with the advantages of low pain, minimally invasive, short operation time and fast postoperative recovery. At present, with the change of people's thoughts and lifestyles, more and more pregnant women who need to end pregnancy in time are asking for painless abortion, which has become an important part of obstetrics and gynecology abortion research.

Propofol has been widely used in artificial abortion, it has a short half-life and rapid onset, the body indicators can be recovered quickly after drug withdrawal; but the analgesic effect of this drug is poor, and the dose should be increased when used solely; during clinical operation, the portio of the patient needs to be expanded, causing cervical traction and thus severe pain of the patient, so if the anesthesia is not complete, it may cause the patient to move during the operation, increasing the risk and difficulty of the operation. Therefore, it is necessary to explore the joint application of other anesthetics and propofol to ensure the effectiveness of anesthesia.

Dezocine is a mixed agonist-antagonist of opioid receptors mainly for the function of K receptor agonist. The receptors are widely distributed in the brain, brain stem and spinal cord. The advantages of good analgesic strength, effective time period, and long duration of action, its effect is equivalent to morphine, but the addiction is less than morphine. At the same time, the dezocine will not produce the typical u receptor dependence, it can fully ensure the relaxation of gastrointestinal smooth muscle and reduce the incidence of nausea and vomiting[5]. Intravenous injection of dezocine during the initial operation can exert its great analgesic effect, and meanwhile because of its minor side effects, it is an ideal postoperative intravenous analgesic drug.

Remifentanil is a new opioid drug, it can quickly reach the concentration balance of plasma and effect chamber, and its metabolism is not affected by plasma cholinesterase and anticholinergic drugs. The N-acyl end of the fentanyl drug structure has an ester bond, which is easily metabolized and degraded by non-specific esterase in plasma and tissues, without relying on liver and kidney function, so its application advantages such as short action time, 3 to 10 minutes of a half-life, no accumulation in repeated application and rapid elimination have also been affirmed in clinic[6].

In this experiment, it was found that compared with the cases in group A, the incidence of pain, body movement and $SPO_2$<90% at the injection site were lower than that in group B and group C, the dose of propofol was reduced, and the VAS scores were both lower, the anesthesia effective rate is higher than group A($P$<0.05); there is no statistical difference in SBP, DBP, HR index data of operation time, postoperative awake time, points in preoperative, intraoperative and postoperative time in the three groups($P$>0.05). This also fully confirms the above analysis, suggesting that the synergy between dezocine and remifentanil and propofol can achieve the anesthesia effect required for artificial abortion surgery, the patient wakes up in time after surgery, making sure safer and more effective operation.

There have been studies claiming that remifentanil, a new generation opioid receptor agonist in the fentanyl family, is a short-acting anesthetic analgesic, which can not only ensure effective analgesic effect, but also avoid respiratory depression with patients' quickly awakening and little impact on heart rate and systolic blood pressure. Dezocine is a benzmorphine derivative, it can effectively activate the k receptor, not only relieving pain for a long time, but also quickly working. Because of its strong fat solubility, it has relatively slight effect on circulation and respiratory depression of patients.

It is discovered in this study that there were no significant difference in SBP, DBP, and HR index data before, during, and after operation in the three groups of patients ($P$>0.05), completely showing that the effect of anesthesia with dezocine and remifentanil combined with propofol in artificial abortion surgery is better than that of propofol alone, which have better anesthesia effect but no fluctuating influence on vital indicators of patients like heart rate and blood pressure at different time points before, during and after the operation.

Above all, it is believed that the effect of dezocine and remifentanil combined with propofol for painless artificial abortion anesthesia is more significant than propofol anesthesia alone, and it can relieve patients' pain and reduce the rate of respiratory depression.

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