Effect Analysis of Dexmedetomidine Combined With Propofol in Bronchoscopy

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Abstract

Objective: To study and analyze the anesthetic effect of dexmedetomidine combined with propofol during bronchoscopy. Methods: 60 patients who received bronchoscopy in our hospital from September 2020 to October 2022 were selected and divided into study group and control group by random number table method, with 30 patients in each group. In bronchoscopy, other medical procedures except anesthesia were consistent between the two groups. The control group was given propofol anesthesia, while the study group was given dexmedetomidine combined with propofol anesthesia. The general treatment, stress indexes before and after bronchoscopy, incidence of adverse reactions and so on were evaluated and compared between the two groups.

Results: There was no statistical difference in the total time spent in bronchoscopy between the two groups (P > 0.05). Anesthesia induction time and recovery time in the study group were shorter than those in the control group, and the difference was statistically significant (P < 0.05). After bronchoscopy, NE and Cor were increased in both groups, and the difference was statistically significant compared with before treatment (P < 0.05). NE and Cor levels in the study group were lower than those in the control group, and the difference was statistically significant (P < 0.05). The incidence of adverse reactions in the study group was lower than that in the control group, and the difference was statistically significant (P < 0.05). Conclusion: In bronchoscopy, dexmedetomidine combined with propofol can shorten the induction time and recovery time of anesthesia, improve the stress response of patients, and enhance the safety of examination.

Keywords

Bronchoscopy, Dexmedetomidine, Propofol, Anesthesia induction, Recovery time
tion of patients [7]. In order to further improve the anesthetic effect of bronchoscopy patients, some patients in our hospital have been given dexmedetomidine combined with propofol anesthesia in recent years. This study was based on partial case data for specific analysis.

1. Data and methods

1.1 General data

60 patients who received bronchoscopy in our hospital from September 2020 to October 2022 were selected and divided into study group and control group by random number table method, with 30 patients in each group. In the study group, there were 17 males and 13 females aged 33-63 (46.39±8.12) years, while in the control group, there were 18 males and 12 females aged 36-65 (45.69±7.90) years. Inclusion criteria: (1) Recipients of elective bronchoscopy; (2) Conscious, able to fully cooperate with the inspection workers; (3) Good mental and psychological state; (4) Know the content of this study and sign the relevant informed consent; (5) Compound related indications of drugs used in this study. Exclusion criteria: (1) Confirmed malignant disease cases; (2) There is a history of drug abuse; (3) There were cases of liver and kidney function impairment; (4) Patients with infectious diseases; (5) Patients with blood system diseases. The study was approved by the hospital ethics committee.

1.2 Methods

Before receiving bronchoscopy, patients in both groups were required to abstain from food and drink and maintain emotional stability. After entering the examination room, the patient was kept in a supine position and given continuous oxygen with a breathing mask. The oxygen concentration was dynamically adjusted according to the actual situation of the patient. Specific anesthesia methods are as follows:

1.2.1 Control group

Propofol anesthesia was administered, intravenous access was established, propofol intravenous injection was administered, and the dosage was 1.5mg/kg. The anesthetic condition of patients was observed. Before anesthesia, the dosage of propofol was increased as appropriate, and the peak value was controlled within 2.5mg/kg.

1.2.2 Study group

Anesthesia was administered with dexmedetomidine combined with propofol, and intravenous injection of propofol was established with a dosage of 1.5mg/kg. The anesthetic condition of patients was observed, and the dosage of propofol was increased as appropriate without anesthesia, and the dosage of dexmedetomidine was 0.5μg/kg.

1.3 Observation indicators

1.3.1 General treatment statistics

The total time spent in bronchoscopy, anesthesia induction time and recovery time of patients in the two groups were counted.

1.3.2 Stress index measurement

3ml of peripheral venous blood was collected from each patient before and after bronchoscopy, and sent to the laboratory for the determination of norepinephrine (NE) and cortisol (Cor).

1.3.3 Statistics of adverse reactions

The occurrence of common adverse reactions after anesthesia in the two groups was analyzed, including respiratory depression, nausea and vomiting, severe cough, etc.

1.4 Statistical methods

SPSS23.0 statistical software was used for processing, measurement data were expressed as (X ± s), comparison was performed by t test, count data were expressed as percentage, comparison was performed by χ² test, P < 0.05 was considered statistically significant.

2. Results

2.1 Comparison of general treatment between the two groups

There was no statistical difference in the total time spent in bronchoscopy between the two groups (P > 0.05), and the anesthesia induction time and recovery time of patients in the study group were both shorter than those in the control group, with statistical significance (P < 0.05), as shown in Table 1.
2.2 Comparison of stress indexes before and after bronchoscopy in the two groups

NE and Cor in the two groups were increased after bronchoscopy, with statistical significance compared with before treatment (P < 0.05); NE and Cor levels in the study group were lower than those in the control group, with statistical significance (P < 0.05), as shown in Table 2.

2.3 Comparison of the incidence of adverse reactions between the two groups:

The incidence of adverse reactions in the study group was lower than that in the control group during treatment, with statistical significance (P < 0.05), as shown in Table 3.

Table 1. Comparison of general treatment between the two groups (x̄ ± s)

<table>
<thead>
<tr>
<th>group</th>
<th>Bronchoscopy takes time (min)</th>
<th>Induction time of anesthesia (min)</th>
<th>Recovery time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>research team/30</td>
<td>20.94±1.84</td>
<td>3.49±0.95</td>
<td>10.13±2.04</td>
</tr>
<tr>
<td>control group/30</td>
<td>21.30±2.03</td>
<td>5.18±0.78</td>
<td>13.74±2.59</td>
</tr>
<tr>
<td>t</td>
<td>0.720</td>
<td>7.531</td>
<td>5.997</td>
</tr>
<tr>
<td>P</td>
<td>0.475</td>
<td>&lt; 0.001</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Table 2. Comparison of stress indexes before and after bronchoscopy between the two groups (x̄ ± s)

<table>
<thead>
<tr>
<th>group</th>
<th>NE(ng/L)</th>
<th>Cor(ng/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before inspection</td>
<td>165.29±40.29</td>
<td>194.28±19.04</td>
</tr>
<tr>
<td>After examination</td>
<td>344.95±44.03</td>
<td>221.04±18.33</td>
</tr>
<tr>
<td>t</td>
<td>0.173</td>
<td>4.841</td>
</tr>
<tr>
<td>P</td>
<td>0.863</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Note: Compared with before inspection, *P < 0.05

Table 3. Comparison of the incidence of adverse reactions between the two groups (case %)

<table>
<thead>
<tr>
<th>group</th>
<th>Respiratory depression</th>
<th>Nausea and vomiting</th>
<th>Violent cough</th>
<th>Total incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>research team/30</td>
<td>0 (0.00)</td>
<td>1 (3.33)</td>
<td>0 (0.00)</td>
<td>1 (3.33)</td>
</tr>
<tr>
<td>control group/30</td>
<td>3 (10.00)</td>
<td>2 (6.67)</td>
<td>1 (3.33)</td>
<td>6 (20.00)</td>
</tr>
<tr>
<td>( \chi^2 )</td>
<td></td>
<td></td>
<td></td>
<td>4.043</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td>0.044</td>
</tr>
</tbody>
</table>

3. Discussion

Bronchoscopy is commonly used in the diagnosis and treatment of respiratory diseases, and intubation is an important operation in the examination. The intubation process will affect the respiratory function of patients, produce painful symptoms, and affect the success rate of intubation [8-9]. With the development and application of anesthesia technology, painless microscopic examination in non-operating room conditions provides great convenience for diagnosis and treatment. The intervention of anesthesia technology effectively alleviates patients' discomfort during examination and reduces the risk of adverse events [10]. Meanwhile, it is found in clinical application that through effective anesthesia and analgesia, patients generally have a high degree of cooperation during examination. More conducive to the clear observation of lesions, improve the efficiency and safety of examination. This study analyzed the application effect of dexmedetomidine combined with propofol anesthesia in bronchoscopy. There was no statistical difference in the total time of bronchoscopy between the two groups (P > 0.05), and the anesthesia induction time and recovery time of patients in the study group were shorter than those in the control group. Propofol is a widely used analgesic drug in current diagnosis and treatment. As a short-acting intravenous anesthetic drug, pro-
propofol will activate gamma-aminobutyric acid type A receptor, promote the binding of gamma-aminobutyric acid and gamma-aminobutyric acid type A receptor, promote the binding of glycine and glycine receptor, and achieve the promotion of the opening of chloride ion channels and the inhibition of synaptic transmission [11-12]. In this process, the release process of various excitatory neurotransmitters in the presynaptic membrane of the central nervous system will be regulated, the level of inhibitory transmitters in the synaptic clematis will be improved, and the synaptic transmission efficiency of excitatory and inhibitory mechanisms in the body will be inhibited [13], thus playing a calming role. When propofol is applied to bronchoscopy patients, there is a risk of respiratory depression. Affected by individual factors, some cases may have unstable vital signs, manifested as abnormal changes in heart rate and blood pressure, which hinder the diagnosis and treatment effect and safety.

After examination, the levels of NE and Cor in the study group were lower than those in the control group, and the difference was statistically significant (P < 0.05). The incidence of adverse reactions in the study group was lower than that in the control group, and the difference was statistically significant (P < 0.05). Dexmedetomidine can play a role in brain stem locus coeruleus and produce specific inhibitory effects on the release process of various neurotransmitters, thus effectively controlling the activity of sympathetic nerve in the body, regulating individual excitability and improving stress response [14]. At the same time, dexmedetomidine can control the concentration of plasma catecholamine by inhibiting the release of norepinephrine, play an analgesic role and control the stress response caused by intubation. It is also beneficial to stabilize the hemodynamic level of patients in bronchoscopy [15-16]. When dexmedetomidine was loaded with propofol, the dosage of propofol was significantly reduced, and there was no risk of respiratory depression of propofol. Combined with relevant studies, it is found that the use of dexmedetomidine can significantly improve the application effect of propofol and regulate the level of EC50 value of propofol [17]. The combined application of dexmedetomidine and propofol in bronchoscopy patients can effectively control the use of the two drugs, obtain ideal analgesic effect, and provide doctors with ideal conditions for intubation. As a highly selective α2 receptor agonist, dexmedetomidine can resist and tolerate histamine ideally. Compared with propofol, dexmedetomidine can inhibit bronchoconstriction risk related to histamine release, regulate and reduce airway reactivity during bronchoscopy, and have better sedative and analgesic effects [18-19]. During bronchoscopy, the dose of dexmedetomidine is small, so it has little effect on the respiratory function of the examined patients. Compared with propofol, the risk of respiratory depression is significantly reduced. Clinical studies have shown that dexmedetomidine can effectively control adverse reactions related to tracheal catheter insertion and stabilize body circulation. Withdrawal of opioids will lead to the risk of "sympathetic storm". Dexmedetomidine can effectively control the release of norepinephrine from brain tissue, regulate and balance the apoptotic protein and anti-apoptotic protein in the body, and play a better neuroprotective function.

In summary, dexmedetomidine combined with propofol has a prominent anesthetic effect in bronchoscopy, which is of great value in promoting anesthesia induction and recovery, controlling early stress response after examination, and improving treatment safety.

References


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