Abstract

Our aim studied to observe the effectivitiy of remifentanil on the hemodynamic response and condition of intubation on intubation without a muscle relaxant using a combination with propofol. A total of six patients aged 25–60 years with the American Society of Anesthesiology physical status I–II underwent elective oncologic surgery. Patients received premedication midazolam 0.05 mg/kg and induction with propofol 2 mg/kg and remifentanil 2 µg/kg intravenously over 60 s. Systolic blood pressure, diastolic blood pressure, and heart rate were observed before premedication, before intubation, and postintubation. Intubation condition was assessed using the Copenhagen Consensus Score based on the ease of laryngoscopy, the position and movement of the vocal cord, and reacting to intubation. All patients were intubated without problem, and the intubation condition was excellent. One patient had hypotension and could be treated by administering the fluids and vasoconstrictor. The other remaining patients were stable without significant hemodynamic changes. A combination of propofol with remifentanil could provide excellent intubation condition and maintaining hemodynamic stability.

Keywords: Copenhagen Consensus Score, intubation without muscle relaxant, remifentanil

Case Report

Six patients with age ranged from 40 to 78 years old with the American Society of Anesthesiology physical status I–II was scheduled for elective oncology surgery under general anesthesia with endotracheal intubation technique. Physical examination predicted no difficult airway. Laboratory and radiology examinations were normal. All patients were given midazolam 0.05 mg/kg as premedication. After that, the patients were transferred to the operating room, and noninvasive monitoring devices (blood pressure measurement, pulse oximetry, and electrocardiography) were placed. Systolic blood pressure, diastolic blood pressure, and pulse rate were measured at baseline. Patients were given preoxygenation for 3 min with normal breathing, and then induction with propofol 2 mg/kg intravenously with slow titration over 30 s followed by remifentanil 2 µg/kg intravenous slow bolus over 60 s. At 30 s later, a laryngoscopy

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procedure was performed using a video laryngoscope, and an endotracheal tube was inserted into the vocal cord.

The vital signs were recorded at preintubation and postintubation at 1, 3, and 5 min [Tables 1 and 2]. The intubation condition quality was assessed using the Copenhagen Consensus Score (CCS). CCS consists of three parameters, i.e., the ease of the laryngoscope, the position and movement of the vocal cords, and reacting to intubation when an endotracheal tube is inserted and the balloon is inflated. The results of the intubation condition assessment then divided into excellent, good, and poor. Apnea due to remifentanil will subside spontaneously in around 6–12 min. Remifentanil is available in a vial with white powder content.

### Discussion

Remifentanil is a new opioid that is a characteristic of ultra-short-acting and short duration of action.[4,5] Remifentanil has a short context-sensitive half time of 3–4 min. Currently, remifentanil is available in 1 mg, 2 mg, and 5 mg. Remifentanil should be diluted using sterile water, 5% dextrose, or 0.9% NaCl. Remifentanil injection must be stored at a temperature of 2°C–25°C. After remifentanil is diluted, it is stable for storage for 24 h at room temperature.[6] In our cases, we administered 2 mg of remifentanil, and we diluted using 0.9% NaCl to become a concentration of 50 µg/ml.

The success of intubation is determined by operator experience, the depth of anesthesia, and degree of muscle relaxation.[5] We did not use a muscle relaxant because we want to observe the effect of remifentanil on intubation without a muscle relaxant. All of the patients were intubated with one attempt. All of the patients can be intubated with the depth of anesthesia, and degree of muscle relaxation.

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The first patient had a significant decrease in blood pressure and heart rate (more than 20% from baseline). The event responded well on administering 20 ml/kg crystalloid and a small dose of vasoconstrictor. Moreover, then, there are no significant hemodynamic changes before and after intubation. The other patients showed no significant hemodynamic change upon observation. We assumed that the combination of propofol and remifentanil is safe for intubation without a muscle relaxant.

We used CCS as the assessment tool to determine the intubation condition. This assessment is based on a recommendation from the Consensus Conference on Good Clinical Research Practice in pharmacodynamic studies of the neuromuscular blocking agent in 1996 and was updated in 2006. The score includes three parameters: ease of laryngoscope, position and movement of the vocal cord, and reacting to intubation. Each parameter is assessed based on the grade as excellent, good, and poor.[7]

In our cases, intubation in all cases was carried out by a similar person. Intubation was carried out using a video laryngoscope to look at the position and movement of the vocal cord indirectly. In all cases, intubation was a success in one attempt. All of the patients can be intubated with intubation condition according to Copenhagen Consensus Score (CCS) is excellent. Remifentanil has a short half-time, and there is no accumulation even after prolonged infusion. Because of these characteristics, remifentanil recommended as continuous infusion. A continuous administration can also avoid fluctuation of the hemodynamic state.[8–10] Remifentanil can be given by a single bolus combined with continuous infusion to maintain its concentration in plasma.[2,10]

### Conclusion

A combination of propofol 2 mg/kg and remifentanil 2 µg/kg through slow intravenous bolus over 60 s without muscle relaxants provided acceptable intubation condition and good hemodynamic stability. Further studies with a larger number of participants are needed in future to confirm this hypothesis and to observe any other potential side effects.
Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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