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A87

October 13, 2007
9:00 AM - 11:00 AM
Room Hall D, Area C,

Capnography-Guided Intubation

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Introduction: Repeated conventional tracheal attempts may contribute to patient morbidity and mortality. In addition, there is a positive correlation between the rate of airway and hemodynamic-related complications and the number of attempts required to successfully intubate the trachea outside the operating room (1). An earlier study explored the use of a capnography-guided intubation device to measure suctioned real-time CO₂ as a guide for endotracheal tube placement during intubation (2). Our current system now integrates a mainstream capnograph, a suction unit to increase flow rate, and an audio circuit to assist the anesthesiologist via a dynamic audible pitch. With an increased flow rate, we assessed CO₂ values between tracheal and esophageal intubations.

Methods: 32 patients between the ages of 18 and 70 were selected for this study, excluding those with obstructed airways, respiratory disease such as asthma and emphysema, obesity, pregnancy, or a history of gastric reflux. The device consisted of a normal ETT with a flexible stylet. Attached at its proximal end was a CO₂ sensor connected to a mainstream capnograph device. Suction through the tube was provided from an independent suction unit and allowed airflow through the CO₂ sensor. With an applied suction of (180 mmHg), airflow of 6.8 liters per minute was generated with a very high Reynolds number.

Results: During 3 esophageal intubations, average suctioned CO₂ was 3.65 ppm (s.d. 0.84) while tracheal intubations averaged 44.65 ppm (s.d. 11.38) (p<0.001). The time to obtain CO₂ data was 6.28 sec for the suction device and 36.06 sec for the side-stream capnograph (2). Figure 1 shows the ROC curve for the sensitivity-specificity function.

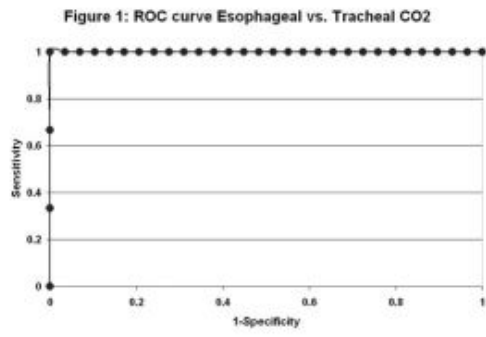
Discussion: The intent of CO₂-guided intubation is to assist the rapid if not immediate detection of CO₂ as the endotracheal tube is advanced. The present study further establishes the validity of discriminating between CO₂ concentrations in the esophagus and the trachea.

References:

1. Anesth Analg, 2004;99:607.
2. Anesthesiology, 2004;101:A510.[figure1]

Anesthesiology 2007; 107: A87

Figure 1



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