Comparison of the C-MAC video laryngoscope to a flexible fiberoptic scope for intubation

Laryngoscopy is a medical procedure performed by anesthesiologists for the purpose of placing a breathing tube into the airway (trachea) of unconscious patients undergoing surgical procedures or with traumatic head and neck injuries. This procedure is technically referred to as 'tracheal intubation' and allows physicians to administer oxygen and anesthetic drugs, as well as the suctioning of secretions in patients with severe lung infections (e.g., pneumonia). The C-MAC video laryngoscope and flexible fiberoptic scope are devices used to visualize the patient's upper airway and facilitate correct placement of the breathing tube in the patient's trachea. The intubation procedure is performed with a device that allows the anesthesiologist to place the breathing tube using either a direct view through the patient's mouth (so-called direct laryngoscopy), a flexible fiberoptic cable viewing device, or an indirect video view using a camera on the end of a traditional laryngoscope and a viewing screen (so-called video laryngoscopy).

Video laryngoscopy is a form of indirect laryngoscopy in which the clinician does not directly view the larynx. Instead, visualization of the larynx is performed with a fiberoptic laryngoscope inserted through the nose or mouth. The traditional flexible fiberoptic scope (FFS) and the newer C-MAC video laryngoscope are both examples of indirect laryngoscopy. The C-MAC video laryngoscopy is a portable device with a camera attached to the tip of the blade which is connected to a video display monitor. The FFS is a flexible fiber-optic bundle that is inserted inside the tracheal tube used to intubate and has been considered the "gold standard" for intubating patients with neck abnormalities requiring neck immobilization. The scope is passed through the mouth or the nose into the upper airway and passes the vocal cords before entering the patient's trachea.

The purpose of this study was to compare the C-MAC video laryngoscope to the standard FFS for placement of a tracheal breathing tube in anesthetized patients undergoing surgical procedures with neck immobilization. We designed a study to evaluate if the use of the C-MAC device as an alternative to the FFS for tracheal intubation in patients with cervical spine immobilization (i.e., inability to move the neck) decreased the time required to achieve successful tracheal intubation, as well as the number of intubation attempts. A total of 140 patients aged 18-80 years old participated in this study. They were randomly assigned to undergo tracheal intubation using either a FFS (70 patients) or the C-MAC video laryngoscope (70 patients). After performing a preoperative airway evaluation, patients were administered a standardized dose of anesthetic drugs to put them to sleep. The time necessary for successful insertion of the breathing tube, number of intubation attempts to secure the airway, and the need for using an alternative intubating airway device, as well as the changes in blood pressure and heart rate were recorded.

Main Results: The C-MAC facilitated more rapid tracheal intubation compared with the 'gold standard' FFS. The maximum increase in heart rate following insertion of the tracheal tube was also reduced in the C-MAC (vs FFS) group.

Conclusion: The C-MAC appears to offer an advantage over the FFS with respect to the time required to achieve successful placement of a tracheal tube (with a reduced stress response) in patients requiring cervical spine immobilization.

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