Video laryngoscopes for all?

The theory concerning the diffusion of innovations began over a century ago. It attempts to identify the factors influencing the adoption of innovative products or ideas in order to slow or accelerate innovation spread. The number of models concerning the diffusion of innovations is vast, yet most encompass key contextual elements including the context, technology, clinician and patient factors. Recent years have seen a boom in innovation intensity offering more technologies albeit at greater cost, often with limited evidence of efficacy.

The innovation of video laryngoscopy came about just over a decade ago, while conventional direct laryngoscopy has stood the test of time and safety as a core anaesthetic skill since Macintosh and Miller introduced their direct laryngoscope blades in the 1940s. Video laryngoscopes consist of high-resolution cameras, a modified blade and a display medium with the purpose of improving the view and success rate of laryngoscopy. Debate is rife within the anaesthetic, emergency medicine and critical care communities with regard to the best and appropriate circumstances of use.

The evidence

The efficacy of video laryngoscopy is difficult to interpret in the context of a comparison group where the success rate of conventional direct laryngoscopy is estimated at >95%. As Healy et al (2012) have shown, the literature is controversial and fragmented by specific device variability, patient subgroups (morbidly obese, intensive care, paediatrics), operator specialty, experience and performance. Chemsian et al (2014) report on the usage of video laryngoscopy for different degrees of predicted airway difficulty, as a rescue device and in specific contexts such as pre-hospital or critical care. The endpoint to be studied must also be highlighted as efficacy may be interpreted broadly as improvement in laryngeal view, time to intubation or success rate at first attempt. A perfect view is also not necessarily required for successful intubation and video laryngoscopes have other uses as described by Zaouter et al (2015), including teaching of anatomy, placement of a transoesophageal probe, tracheostomy insertion and foreign body retrieval.

Advantages

Video laryngoscopy technology does have a number of potential advantages and each device has specific strengths and weaknesses (Chemsian et al, 2014). A direct line of sight to the airway is no longer required. The success rate of intubation is high and the view may be improved in patients who have limited mouth opening, who are obese or who have cervical spine immobilization (Cheyne and Doyle, 2010).

There is less risk of inadvertent oesophageal intubation, trauma to the pharynx and teeth and haemodynamic response to intubation with video laryngoscopy. It has a shorter learning curve for novices and prices of the equipment are becoming increasingly reasonable (Chemsian et al, 2014). The video output is useful for education, documentation of anatomy and view, and as a tool for sharing information among the team and for future reference (Zaouter et al, 2015).

Disadvantages

The disadvantages, however, include the market presence of a wide spectrum of devices with variable learning curves, a longer time to intubation and inability to pass the tube despite having a good view. There is greater potential for equipment failure and difficulties with accessibility and familiarity (Chemsian et al, 2014). There is also concern that using an alternative skill set could potentially weaken existing skills in direct laryngoscopy. As suggested by Cheyne and Doyle (2010), some scopes are difficult to insert because the bulky equipment restricts mouth opening and the video screen may be difficult to visualize because of its location or surrounding conditions. Secretions or airway contamination may also affect the view by causing fogging or lens obstruction. Case reports have also identified trauma as a result of loss of depth perception during insertion and the use of stylets.

Conclusions

Overall, there is a need for more studies to elicit the best application and outcomes of video laryngoscopy. At present, skills must be acquired and maintained in both direct laryngoscopy and video laryngoscopy, even if using video laryngoscopy as a rescue technique. The updated guidelines for 2015 by the Difficult Airway Society specifically include video laryngoscopy and the American Society of Anesthesiologists has also incorporated video laryngoscopy into their 'Alternative Difficult Intubation Approaches' guidance. Clearly there is an argument for both techniques and the user must consider the scenario and the patient before deciding on the most likely strategy for success in each case. **BJHM**

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