Pro-Con: LMA vs ETT for the Patient with a URI

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Few issues in pediatric anesthesiology have been as contentious as the one regarding anesthesia for the child who presents for elective surgery with an upper respiratory tract infection (URI). Although several studies suggest that anesthesia increases the risk of perioperative respiratory complications in these children (1-4), others show that these risks are typically small and can be easily managed (5-7).

Viral infections of the upper respiratory tract provoke a number of morphological and physiological changes including, sloughing of the respiratory epithelium and decreases in airway conductance, diffusion rates, and functional residual capacity. Of note is the propensity for altered airway reactivity that may persist for up to 6 weeks following an infection. In the presence of anesthesia, these responses may result in an increased incidence of laryngospasm (1,8), bronchospasm (5,9), and arterial oxygen desaturation (5,10,11).

In light of these observations, it would appear prudent to limit their effects, whenever possible, by minimizing manipulation of a potentially irritable airway. Traditionally, the face mask (FM) has been the technique of choice for children with URIs. However, despite the low incidence of complications using this technique, the FM is not suitable for certain surgical procedures. Until fairly recently, the endotracheal tube has been the only alternative to the FM, however, several studies have shown that placement of an endotracheal tube (ETT) in a child with a URI is associated with an incresed risk of perioperative respiratory complications, including, laryngospasm, cough, and arterial oxygen desaturation (1-3). In one large-scale study, Cohen et al. showed that tracheal intubation increased the risk of respiratory complications 11-fold for children with URIs (1). Furthermore, two large prospective studies identified tracheal intubation as an independent risk factor for adverse respiratory events in children with URIs (2,3).

Since its inception in 1988, the laryngeal mask airway (LMA) has proven to be a safe and effective technique for airway management in both adults and children. In a meta-analysis of 52 randomized clinical trials, Brimacombe (12) identified 13 advantages of the LMA compared to the ETT and two disadvantages. Advantages of the LMA included; speed and ease of insertion, improved hemodynamic stability on induction and emergence, minimal increase in intraocular pressure after insertion, decreased anesthetic requirements for airway tolerance, decreased coughing and sore throat, and improved arterial oxygenation on emergence. Disadvantages of the LMA over the ETT

included decreased seal pressures and an increased likelihood of gastric insufflation. Based on these observations, the LMA appears to provide an attractive alternative to the ETT for airway management in children with URIs.

Two randomized studies have compared the efficacy of the LMA versus the ETT for airway management in children with URIs (13,14). In one study, Tartari et al. showed that children with URIs who had their tracheas intubated experienced over twice the incidence of minor postoperative adverse events compared to those who received an LMA (74% *vs* 32%, respectively)(14). In the other study, use of an ETT was associated with a significantly increased risk of major (<90%) arterial oxygen desaturation, minor bronchospasm, and overall adverse events compared to the LMA (13). Similarly, in a large-scale prospective, observational study, use of an LMA in children with active URIs was also associated with a reduced risk of major oxygen desaturation and overall adverse events compared to an ETT (3). In particular, placement and removal of the ETT was associated with a significantly increased incidence of adverse respiratory events compared to placement and removal of the LMA.

In addition to these outcomes, the LMA has also been associated with a decreased incidence of postoperative sore throat in children with and without URIs. In one study of children with active URIs, the incidence of postoperative sore throat was greater in children who received an ETT compared to those receiving an LMA (25.7% *vs* 16.5%) (3).

Recent studies have identified a number of risk factors for children who present for anesthesia with a URI (2,3). These include; presence of reactive airway disease, surgery involving the airway, history of prematurity, exposure to environmental tobacco smoke, presence of nasal congestion or copious secretions, and placement of an endotracheal tube. Despite these findings, several studies confirm that with careful management, the majority of these children can undergo elective procedures safely with minimal morbidity. Furthermore, data suggests that the LMA offers a suitable alternative to the ETT for airway management in children with URIs, bearing in mind that for certain procedures, the choice of airway device must also take into consideration the balance between the potential risks of respiratory complications and those of a failed or insecure airway.

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