Commentary

Lignocaine delivery for topical anesthesia during bronchoscopy: Recent advances

Topical anesthesia is a cardinal component of optimizing patient comfort during flexible bronchoscopy.[1,2] Lignocaine is the most commonly used drug for topical anesthesia in airway procedures, including bronchoscopy. Flexible bronchoscopy may be performed with or without the administration of sedation. Although administration of intravenous sedation improves the tolerance to bronchoscopy, in many settings, including India, bronchoscopy is commonly performed under no-sedation or minimal sedation.[3] When performed under minimal or no-sedation, topical anesthesia assumes paramount importance for patient comfort. Lignocaine may be uncommonly associated with life-threatening complications, hence must be used in the minimum possible dose.[4,5] Varying concentrations (0.5%–4%) of lignocaine have been used during flexible bronchoscopy. A lower concentration of lignocaine (1% as compared to 2%) is efficacious for airway anesthesia during FB and endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA).[6-8] Minimization of lignocaine dose and optimization of patient comfort is the cardinal goal of any topical anesthesia method.

The components of lignocaine delivery during FB include nasal anesthesia, pharyngeal anesthesia, and anesthesia for the vocal cords and the trachea. Lignocaine gel (2%) is a well-accepted modality for nasal anesthesia. The commonly used options for pharyngeal anesthesia include nebulized lignocaine and lignocaine spray. Sufficient evidence is available now that does not support the routine use of nebulized lignocaine, in addition to pharyngeal lignocaine spray during bronchoscopy.[9-11] Therefore, 10% of lignocaine spray is a well-accepted modality of pharyngeal lignocaine delivery during FB. A trial evaluating the dose of lignocaine spray for pharyngeal administration is currently underway (ClinicalTrials.gov Identifier: NCT03869528).

Recent randomized controlled trials (RCT's) have improved our understanding of lignocaine delivery to the vocal cords and the trachea. Administration through the working channel of the bronchoscope (spray-as-you-go method) and direct intratracheal injection of lignocaine (the cricothyroid method) are both recommended as acceptable modalities for this purpose. Recent RCTs have demonstrated the superiority of the cricothyroid method as compared to the spray-as-you-go method for airway anesthesia during FB.[12,13] Along with superior comfort and less cough; the cricothyroid method is associated with a significantly less cumulative lignocaine exposure during the procedure. A recently completed RCT (ClinicalTrials.gov Identifier NCT02981264) has observed similar advantages with the cricothyroid method for EBUS-TBNA (unpublished). Many centers have changed their practice to increasingly adopt the cricothyroid method for lignocaine delivery for FB as well as EBUS-TBNA.

In this issue of Lung India, Venkatnarayan *et al*. reported the findings of their RCT that found lignocaine administration through an alternative method of spray-as-you-go delivery, i.e., by using a spray catheter (compared with the conventional spray-as-you-go) reduced cough, need for sedation and increased operator satisfaction. The findings of this study are similar to pilot RCT on spray catheter use during EBUS-TBNA.[14] The limitations of the study, most importantly, observer bias has been well discussed by the authors. It is not clear if the findings will be similar with a lower concentration of lignocaine (1%) as 2% lignocaine was used for spray administration in this study. Another possible disadvantage of using a spray catheter would be loss of suction during the time the catheter is inside the bronchoscope working channel. The likely benefit of this method is due to the more uniform lignocaine spread over the mucosa. On the other hand, the possibility of higher systemic absorption cannot be excluded as a significant amount of lignocaine may be suctioned back during secretion clearance in the conventional spray-as-you-go method. Serum lignocaine levels were not performed in this RCT, as in most trials concerning topical anesthesia in bronchoscopy. Another potential issue with spray catheter use is the increased time taken for lignocaine instillation. A dedicated spray catheter for each patient may translate into increased cost and needs to be considered. Whether a separate spray catheter was used for each patient was not described by the authors. Diagnostic bronchoscopies in this study were only for bronchoalveolar lavage. It will be interesting to compare the performance characteristics of this method with the conventional spray-as-you-go method and the cricothyroid method for other diagnostic procedures such as endobronchial biopsy, transbronchial lung biopsy and TBNA. The cricothyroid method performs better for all diagnostic bronchoscopy procedures included including biopsy and TBNA.[12] The findings of this study are important, and authors must be congratulated for their novel work. Based on the findings of the study, a spray catheter may be considered when the spray-as-you-go method is being employed during the procedure. Few other novel modalities have also been explored in recent

years, such as an RCT that observed favorable topical anesthesia characteristics with the use of nebulized dexmedetomidine-lignocaine combination.[15]

Topical airway anesthesia for bronchoscopy has gained significant attention over the past decade. Multiple key RCTs have improved our understanding of this subject. The research in the context of no-sedation bronchoscopy is expected to be driven by proceduralists in settings where No-Sedation bronchoscopy commonly performed.

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