

# Expanding the Scope of Flexible Fiberoptic Bronchoscopy in the PICU

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Flexible fiberoptic bronchoscopy in pediatric patients is now an established diagnostic and therapeutic procedure and finds many applications.<sup>1–3</sup> With the advent of ultrathin scopes, this can be safely performed in smaller babies, and in preterm neonates too.<sup>4</sup>

Flexible fiberoptic bronchoscopy is generally safe if performed with adequate preparation and by trained personnel.<sup>5</sup> Absolute contraindications to bronchoscopy are few, if any. However, relative contraindications include bleeding diathesis, hypoxemia, hemodynamic instability, and severe bronchospasm.<sup>2</sup>

Bronchoscopy has been performed on critically ill patients on mechanical ventilation at the bedside, with good results and with minimal complications.<sup>2,5</sup> In fact, safety and utility have been established in neonates too.<sup>6</sup> Similar studies exclusively in non-intubated children are not available, since most studies in critically ill children include those on invasive ventilation too.<sup>3</sup>

In this issue of the journal, Sachdev et al. have described their experience of flexible fiberoptic bronchoscopy (FFB) in a cohort of sick children requiring intensive care unit (ICU) but not on invasive mechanical ventilation.<sup>7</sup> In this retrospective study, children either on conventional oxygen therapy or non-invasive respiratory support (HFNC or non-invasive ventilation) underwent bronchoscopy for diagnostic or therapeutic indications. The authors' past experience with this procedure in critically ill children on invasive mechanical ventilation is evident in this study too as they have performed the procedures safely in these sick children.<sup>8</sup>

The various indications for these FFBs included atelectasis, stridor, persistent cough, non-resolving pneumonia, oxygen dependence, persistent wheezing, and suspected foreign body, for assessment of the airways, and diagnostic bronchoalveolar lavage. The indication in two patients is mentioned as 'weaning failure', though this study was apparently in children who were not on invasive ventilation. This entity could have been elaborated upon.

These FFB procedures led to changes in the management of 96 patients (62%). This included surgical management and changes in medical management. This is a substantial gain, with regard to patient management. A word of caution, however, is needed here. Among changes in medical management, one of the commonest medical interventions was the change in antibiotics (either de-escalation or upgradation). Often, an astute clinician would be able to judge the need for a change of antibiotics even without an invasive procedure such as a bronchoscopy.

No abnormality was detected, or rather, a negative bronchoscopy was observed in 22 patients (14%). A negative bronchoscopy or a normal bronchoscopy is also an important finding as it helps in ruling out the suspected condition, e.g., an airway foreign body.

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Minor complications were seen in 27% of the children including minor bleeding in 9 children (14%) and desaturation requiring an increase in FiO<sub>2</sub> in 26 children (16.8%); these resolved easily in all. The SPO<sub>2</sub>:FiO<sub>2</sub> ratio in the children fell from a mean of 240 ± 53.9 preprocedure to 147 ± 29.2, but corrected to 253.6 ± 62.8 postprocedure. Transient withdrawal of the bronchoscope was required in 7 children (4.5%), though the procedures could be completed subsequently. Such complications are well described in the literature and stress the need for careful monitoring during bronchoscopy. However, the minor complication rate also seems rather high, with most other studies encountering around 12.9% transient complications.<sup>3</sup> Minor bleeding has been encountered in 4% of the patients; this proportion is also higher in the index study. Postprocedure fever was seen in 12% of the patients; this has been described in around a fifth of the patients.<sup>2,3</sup>

The severity of illness of the patients either at admission or at the time of procedure was not mentioned in the study. The value of the study would be enhanced several folds, if this vital information was provided, especially since more complications were seen in this study.

Overall, this study adds to the literature on the utility and safety of flexible fiberoptic bronchoscopy done in the PICU in children on either conventional or non-invasive oxygen therapy.

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