INPLASY

High-flow Nasal Cannula for Sedation During Flexible Bronchoscopy: A Meta analysis

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ADMINISTRATIVE INFORMATION

INTRODUCTION

*R*eview question / Objective Oxygen desaturation is a common complication during the flexible bronchoscopy procedure. High-flow nasal cannula (HFNC) oxygen therapy is recommended as a high flow system for oxygenation to reduce the incidence of hypoxia. However, evidence for the efficacy and safety of HFNC during flexible bronchoscopy is conflicting. Therefore, we intented to performe a meta-analysis of randomized controlled trials to explore whether HFNC is superior to standard oxygen therapy in reducing hypoxemic events in sedated patients undergoing flexiblebronchoscopy.

Condition being studied Some scholars have investigated HFNC, comparing it to standard oxygen therapy for patients undergoing procedural (conscious) sedation during flexible bronchoscopy.

In the trial reported by Douglas, the proportion of patients experiencing desaturation below 90% in HFNC group did not reach statistical significance. However, in recent years, some researchers have shown that HFNC can prevent desaturation. Moreover, Ben-Menachem showed that HFNC presented hypoxia in longer procedures performed under deep sedation. Given these conflicting reports, HFNC remains controversial in patients undergoing flexible bronchoscopy.

METHODS

Search strategy Two researchers independently conducted a comprehensive search of the PubMed, EMBASE, Web of Science, and Cochrane databases from January 1, 2007 to December 31, 2023 for RCTs investigating the role of HFNC in flexible bronchoscopy. A starting date of 2007 was

chosen since HFNC was not widely used in adults before then.

We searched for studies that referred to patients treated with HFNC using the key words "high-flow nasal cannula", "nasal high-flow therapy", "high frequency", "high-flow", "high-flow oxygen therapy", "NHF", "HFNC" or "HFOT" together with "bronchoscopy", "bronchoalveolar" or "bronchial".

Participant or population Adult patients undergoing flexible bronchoscopy.

Intervention HFNC.

Comparator Standard oxygen therapy, using traditional nasal cannula (i.e. nasal prongs).

Study designs to be included Randomized controlled trials.

Eligibility criteria 1) RCTs; 2) intervention: HFNC compared to standard oxygen therapy; 3) predefined outcomes: included but not limited to the proportion of patients experiencing desaturation and the lowest (nadir) oxygen saturation during bronchoscopy.

Information sources PubMed, EMBASE, Web of Science, and Cochrane databases.

Main outcome(s) The primary purpose of this study was to evaluate the proportion of patients experiencing desaturation, defined as an oxygen saturation (SpO_2) <90%, and the lowest oxygen saturation during bronchoscopy.

Additional outcome(s) The secondary outcomes included the end-tidal CO2 (ETCO2) level at the end of the procedure, the duration of the procedure, and the proportion of patients requiring interruption of the procedure for airway management.

Quality assessment / Risk of bias analysis The risk of bias (RoB) for the included RCTs was evaluated using a modified Cochrane RoB tool, which is composed of seven evaluation elements, including random sequence generation, allocation concealment, blinding of participants and personnel, blinding of the outcome assessment, incomplete outcome data, selective reporting, or other biases.

Strategy of data synthesis Mean deviation (MD) or standard mean difference (SMD) for continuous outcomes and relative risk (RR) for discontinuous outcomes, with 95% confidence intervals (CIs) were used as statistical indices. The Mantel-

Haenszel (MH) chi-square test, the I-square test, and visual estimates of the forest plots were performed to evaluate homogeneity. If there was obvious heterogeneity (e.g. I-square value was >50%), then the random effect model was performed. Otherwise, the fixed effect model was used.

Subgroup analysis None.

Sensitivity analysis When significant heterogeneity was found, we conducted a sensitivity analysis to detect the influence of a single study on the overall effects.

Language restriction English.

Country(ies) involved China.

Keywords High-flow nasal cannula; oxygen inhalation therapy; bronchoscopy; sedation; critical care; meta-analysis.

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