INPLASY PROTOCOL

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Support: No.

Review Stage at time of this submission: Preliminary searches.

Conflicts of interest: None declared.

Effect of supraglottic jet oxygenation and ventilation on hyoxemia in patients undergoing endoscopic surgery with sedation: a meta-analysis of randomized controlled trials

Xu, RK[1]; Shen, YX[2]; Chen, W[3]; Zhang, WW[4]; Xu, YJ[5]; Zhang, Y[6]; Zhu, LL[7]; Wang, XL[8].

Review question / Objective: The purpose of this study is to assess whether supraglottic jet oxygenation and ventilation is more effective than conventional noninvasive ventilation in reducing the risk of intraoperative oxygen desaturation.

Condition being studied: Supraglottic jet oxygenation and ventilation (SJOV) is a new minimally invasive supraglottic ventilation technique, which has shown advantages in maintaining oxygenation. Recently, Wei, H. proposed SJOV for patients with hypoxia and respiratory depression caused by acute trauma, which suggests the superiority of SJOV in maintaining oxygenation. Thus, through this meta-analysis, we aim to explore whether SJOV is more effective in reducing the occurrence of hypoxemia in endoscopic surgery compared with conventional non-invasive oxygenation ventilation.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 14 October 2022 and was last updated on 14 October 2022 (registration number INPLASY2022100059).

INTRODUCTION

Review question / Objective: The purpose of this study is to assess whether supraglottic jet oxygenation and ventilation is more effective than conventional noninvasive ventilation in reducing the risk of intraoperative oxygen desaturation.

Rationale: While sedation can improve the tolerance and satisfaction of patients during the endoscopic surgery, it can cause respiratory depression. Though conventional NIV such as nasal cannula or face masks are commonly used in endoscopic surgery for airway

management, it cannot decrease the risk of hypoxemia especially for those patients with high risk of airway. Through this meta-analysis, we aim to explore whether supraglottic jet oxygenation and ventilation is more effective in reducing the occurrence of hypoxemia in endoscopic surgery compared with conventional non-invasive oxygenation ventilation.

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METHODS

Search strategy: Search terms included "endoscopy", "fiberoptic bronchoscopy", "hysteroscopy", "gastroscopy", "colonoscopy", "gastrointestinal endoscopy" and "bronchoscopy" in Chinese Databases. "High-Frequency Jet Ventilation""Jet Ventilation" "Jet Ventilations" "jet" "jet oxygenation" "supraglottic" "Nasopharyngeal" "Oropharyngeal" "Transnasal" "Transoral". When the number of literature retrieval is deficient, intervention(I) is the main method, then manual screening is carried out according to "PICOS", and manual screening of RCT(S). There are no restrictions on language types. For different databases, we used different search formulas to avoid omissions.

Participant or population: Patients undergoing endoscopic surgery.

Intervention: Supraglottic jet oxygenation and ventilation.

Comparator: Conventional noninvasive ventilation.

Study designs to be included: RCT.

Eligibility criteria: Studies that met the following criteria were eligible for inclusion: Randomized controlled trials (RCTs); Patients undergoing endoscopic surgery (Digestive endoscopy, Hysteroscopy, Fiberoptic bronchoscopy, etc.) with the use of supraglottic jet ventilation for intervention; Age>18 years; The experimental group received supraglottic jet oxygenation and ventilation. Studies were ruled out as follows: The control group received mechanical ventilation; ASA Physical Status classification above IV; Patient with coagulopathy.

Information sources: PubMed, Embase, Cochrane Library, CBM, CNKI and WanfangData.

Main outcome(s): The incidence of hypoxemia.

Additional outcome(s): The incidence of respiratory depression and other adverse effects such as nasal bleeding, sore throat and dry mouth.

Data management: Each study was extracted information as follows: author, published year, surgical categories, risk categories, equipment parameters, the definition of hypoxemia and the primary outcome measures.

Quality assessment / Risk of bias analysis: We used the Cochrane Collaboration's tools to assess risk of bias.

Strategy of data synthesis: All of the data and analysis were used in RevMan 5.4. The results of this study were presented as relative risk (RR) which indicates the pooled statistic of dichotomous data, and it was tested by 95% confidence interval (CI). For continuous variables, we use the mean and standard deviation (SD), 95% CI. When making the forest plot, we also conducted heterogeneity tests. Q statistic (Chi-

square value of the heterogeneity test）, P-value and I2 statistic were used to evaluate the heterogeneity among studies. Significant heterogeneity was considered when P≤0.1 or I2>50%. However, we chose the random effect model using DerSimonian & Laird (D-L) method for it is more applicable to various populations in a wide background.All of the data and analysis were used in RevMan 5.4. The results of this study were presented as relative risk (RR) which indicates the pooled statistic of dichotomous data, and it was tested by 95% confidence interval (CI). For continuous variables, we use the mean and standard deviation (SD), 95% CI. When making the forest plot, we also conducted heterogeneity tests. Q statistic（Chi-square value of the heterogeneity test）, P-value and I2 statistic were used to evaluate the heterogeneity among studies. Significant heterogeneity was considered when P≤0.1 or I2>50%. However we chose random effect model using DerSimonian & Laird (D-L) method for it is more applicable to various populations in a wide background.

Subgroup analysis: The incidence of hypoxemia was divided into high and low risk subgroups according to the type of procedure and patient profile.

Sensitivity analysis: No.

Language restriction: No restriction.

Country(ies) involved: China.

Other relevant information: None.

Keywords: Supraglottic jet oxygenation and ventilation, noninvasive ventilation, hypoxemia.

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