

INPLASY PROTOCOL

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None declared.

INTRODUCTION

Review question / Objective: P: Interstitial lung disease patient who is suffering with acute respiratory failure. I: Non-invasive oxygen therapy either non-invasive ventilation (NIV) or high flow nasal cannula (HFNC). C: 1. Conventional oxygen therapy, 2. NIV vs HFNC. O: P/F ratio improvement, PaCO₂ reduction, mortality, intubation rate.

Rationale: Interstitial lung disease consists of several hardly-diagnosed diffusion defecting diseases; furthermore, the mortality rate is significantly high. The patient is suffering of acute respiratory failure from multiple causes such as acute exacerbation, infection and deterioration of lung function. The intubation leads to negative consequences outcomes considering avoidance; while the conventional oxygen therapy minimally changes results. Most of the patients have

Effect of non-invasive ventilation and high flow nasal cannula on interstitial lung disease with acute respiratory failure: A systematic review and meta-analysis

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Condition being studied: The benefit of using either non-invasive ventilation or high flow nasal cannula on interstitial lung disease with acute respiratory failure.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 27 June 2022 and was last updated on 27 June 2022 (registration number INPLASY202260104).

experience for long term oxygen therapy which is increasing over time. There are scarce studies conducting the benefit of non-invasive oxygen therapy - NIV and HFNC among this group of patients. Our study conducts systematic review and meta-analysis of interstitial lung disease patient with acute respiratory failure using either NIV or HFNC to analyze the outcomes (P/F ratio, PaCO₂, mortality and intubation rate).

Condition being studied: The benefit of using either non-invasive ventilation or high flow nasal cannula on interstitial lung disease with acute respiratory failure.

METHODS

Search strategy: This systematic review and meta-analysis followed the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA). Electronic systematic searches were conducted for articles published before June 26, 2022 using MEDLINE, EMBASE, COCHRANE. The medical subject headings (MeSHs) used in our searches included "non-invasive ventilation" or "high flow nasal cannula" and "interstitial lung disease". There was no language restriction.

Participant or population: Interstitial lung disease with acute respiratory failure.

Intervention: Non-invasive ventilation (NIV) or High flow nasal cannula (HFNC).

Comparator: 1. Conventional oxygen therapy 2. comparing between NIV and HFNC

Study designs to be included: All prospective, retrospective cohort and experimental study are included.

Eligibility criteria: Exclusion criteria: non-interstitial lung diseases included airway disease and bronchiectasis, out-patient clinic, case report, case series and ongoing study trials.

Information sources: Electronic database from MEDLINE, EMBASE, COCHRANE and GOOGLE.

Main outcome(s): Primary outcome: A pooled analysis was performed from the 6 studies using a random-effect in P/F ratio comparing between non-invasive oxygen therapy and conventional oxygen therapy. Secondary outcomes: PaCO₂, mortality rate and intubation rate.

Data management: The data will be collected in VP's hard disk and google drive.

Quality assessment / Risk of bias analysis: We described the risk of bias with ROBIN-I in non-randomized studies of intervention (9 studies) and RoB2 for randomized study of intervention (1 study). Regarding most of the studies were retrospective cohort study, overall rating were moderate to serious.

Strategy of data synthesis: We conducted meta-analysis calculation using Review Manager 5.4.1 software from the Cochrane Collaboration (London, United Kingdom). We extracted the proportions and 95% confidence interval (CIs) from each study and pooled them using the random effect model. Cochrane's Q test was performed and quantified using the I² statistic to determine the statistical heterogeneity among the included studies. P-value less than 0.05 were considered statistically significant. The presence of a publication bias was visualized by the funnel plot.

Subgroup analysis: In PF ratio outcome, we did subgroup analysis into NIV (4 studies) and HFNC (2 studies). The overall outcome demonstrated insignificant result to improve P/F ration comparing between conventional oxygen therapy and non-invasive oxygen therapy. However, in both NIV and HFNC subgroup tended to improve P/F ratio compared to conventional oxygen therapy.

Sensitivity analysis: We conducted the sensitivity analysis using Review Manager

website in Cochrane's online review-writing platform.

Country(ies) involved: Thailand, Thai, Chulalongkorn University and King Chulalongkorn memorial hospital.

Keywords: interstitial lung disease, non-invasive ventilation, high flow nasal cannula, acute respiratory failure, acute exacerbation.

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