

A systematic review: Can nasal high flow (NHF) compared with bag valve mask (BVM) use in preoxygenation improve safety in rapid sequence intubation (RSI) in critically ill patients ?



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Introduction

- The NAP4 project found that **1 in 4 cases of airway complications occurred in ICU or ED**.
- NHF was found to **potentially improve oxygenation and prolong safe apnoea time in anaesthetic environments**.
- Potential benefits of using NHF for preoxygenation is to bypass from face mask to BVM and **prolonged oxygenation and preoxygenation during RSI**.
- There were **no systematic review** comparing BVM and NHF for preoxygenation in critically ill patients for RSI.
- This poster was adapted from the primary author's Dissertation for a Critical Care Masters.

Method

- We screened 650 studies from 12 databases
- 54 studies were assessed for eligibility and 4 randomised controlled trial (RCTs) and 1 non-RCT were included in the review. 2 studies are still ongoing.
- The 5 studies were assessed for risk of bias.

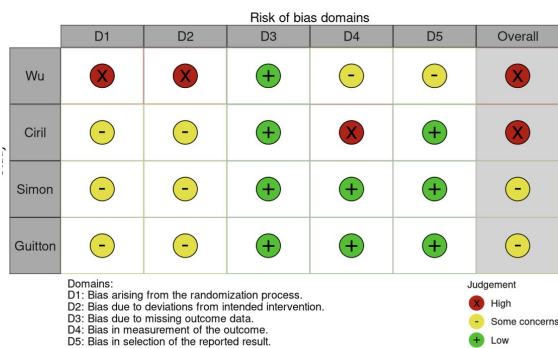


FIGURE 1: RISK OF BIAS VISUALISATION FOR RCTS



FIGURE 2: RISK OF BIAS VISUALISATION FOR NON-RANDOMISED STUDIES

The **overall Risk of Bias was High**.



Results

- The 4 RCTs (n=417) and 1 non-RCTs (n=319) had mixed results in supporting the use of NHF in preoxygenation.
- When all the studies are included, the lowest % saturation (primary outcome) was **statistically significant** with a standard mean difference of 0.26 (SMD)(p<0.01).
- However, when the **2 RCTs that are high risk of bias are removed, there are no statistically significant differences between the trials** with a SMD of 0.14 (p=0.29).
- The overall GRADE is low certainty.

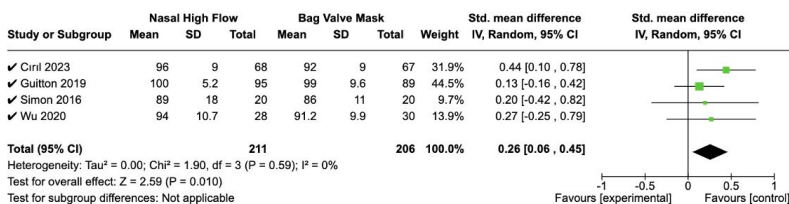


FIGURE 11: META-ANALYSIS - SMD - (REM) LOWEST SPO2 DURING PROCEDURE

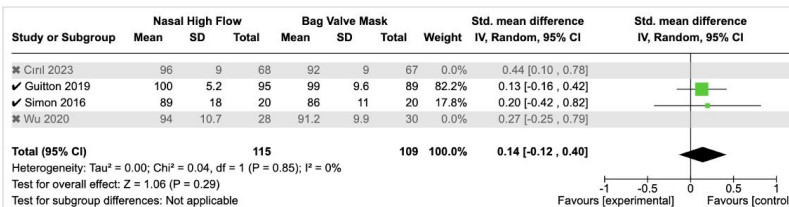
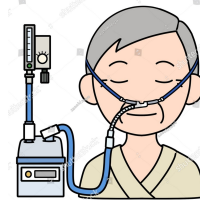


FIGURE 12: SMD - BVM VS NHF (REM) LOWEST SPO2 DURING PROCEDURE - EXCLUDING HIGH RISK BIAS TRIALS

Conclusions & Key Points

- The primary finding is that **there is low certainty that NHF does not improve safety more than BVM when used in preoxygenation for RSI in hypoxic patients** when examining the lowest % SpO2 during intubation procedure.
- **NHF benefits may not be helpful for critically ill patients with shunting because they desaturate rapidly and have reduced oxygen storage.**
- In addition, the studies conducted in anaesthetic environments were more ideal for preoxygenation with more **optimum conditions compared to ICU**.
- Two trials are still ongoing so data may change. **Further research with large, low risk of bias RCTs are needed to be conducted.**



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