



## 78th Anniversary of the PostGraduate Assembly in Anesthesiology

Medically Challenging Cases: ePoster presentation

## Pressure-Controlled Ventilation versus Volume-Controlled Ventilation for Adult Patients with Acute Respiratory Failure: A Systematic Review and Meta-Analysis



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### Background

Mechanical ventilator is the mainstay treatment for patients with acute respiratory failure. The common ventilation modes include pressure-controlled ventilation (PCV) and volume-controlled ventilation (VCV). However, there was controversy about the benefits of PCV when comparing with VCV from previous studies. This study aimed to compare the effectiveness of the two ventilations in adult patients with any causes of acute respiratory failure.

### Methodology

This systematic review included any randomized controlled trials compared VCV and PCV ventilator mode in intubated adult patients with acute respiratory failure from any conditions. There were two interesting outcomes of this review including incidence of barotrauma, pneumothorax and in-hospital mortality rate. We performed a comprehensive search of four electronic databases including PubMed, Central, Scopus, and CINAHL from inception to July 14, 2023. Two reviewers independently conducted the screening titles and abstracts, extracting data, and evaluating risk of bias. Meta-analysis with fixed-effect model was used to pool the results of included studies.

### Results

Three studies collected data from ARDS patients and one study included COPD Patients with open heart surgery. The total patients in the VCV and PCV groups were 581 and 548 patients, respectively. (total of 1,089).

The VCV group had no significantly different incidence of barotrauma when compared with the PCV group with RR 0.79 ( 95% CI 0.56 to 1.12) and also had no statistical difference between mortality rate (RR 1.15 95% CI 1.00 to 1.33).

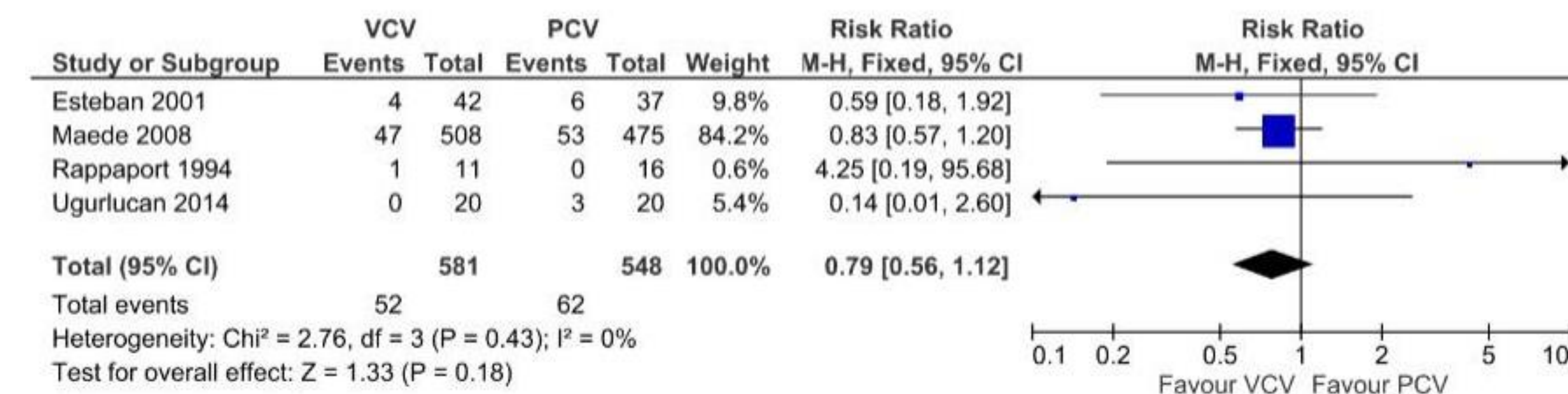
### Conclusion

**Incidence of Barotrauma and Pneumothorax:** The review found no significant difference in the incidence of barotrauma between PCV and VCV (Relative Risk (RR) 0.79, 95% CI 0.56 to 1.12). This suggests that neither mode is definitively safer in terms of barotrauma risk.

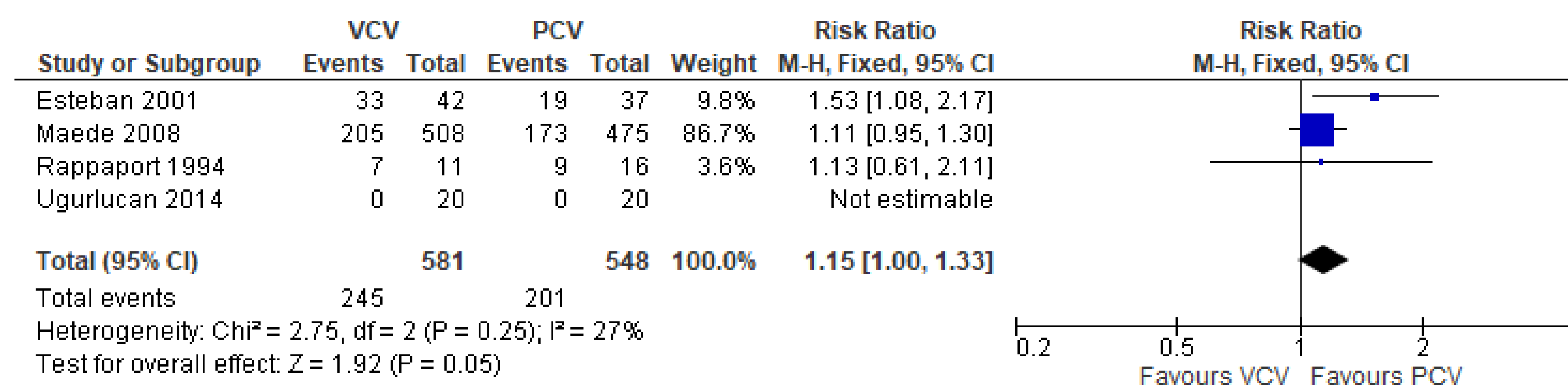
**In-Hospital Mortality Rate:** Similarly, there was no statistical difference in mortality rate between PCV and VCV (RR 1.15, 95% CI 1.00 to 1.33). This indicates that both modes are comparable in terms of patient survival.

This review suggests that other factors — such as tidal volume and airway pressure — may influence outcomes like barotrauma. Further research is recommended to explore these factors in more depth.

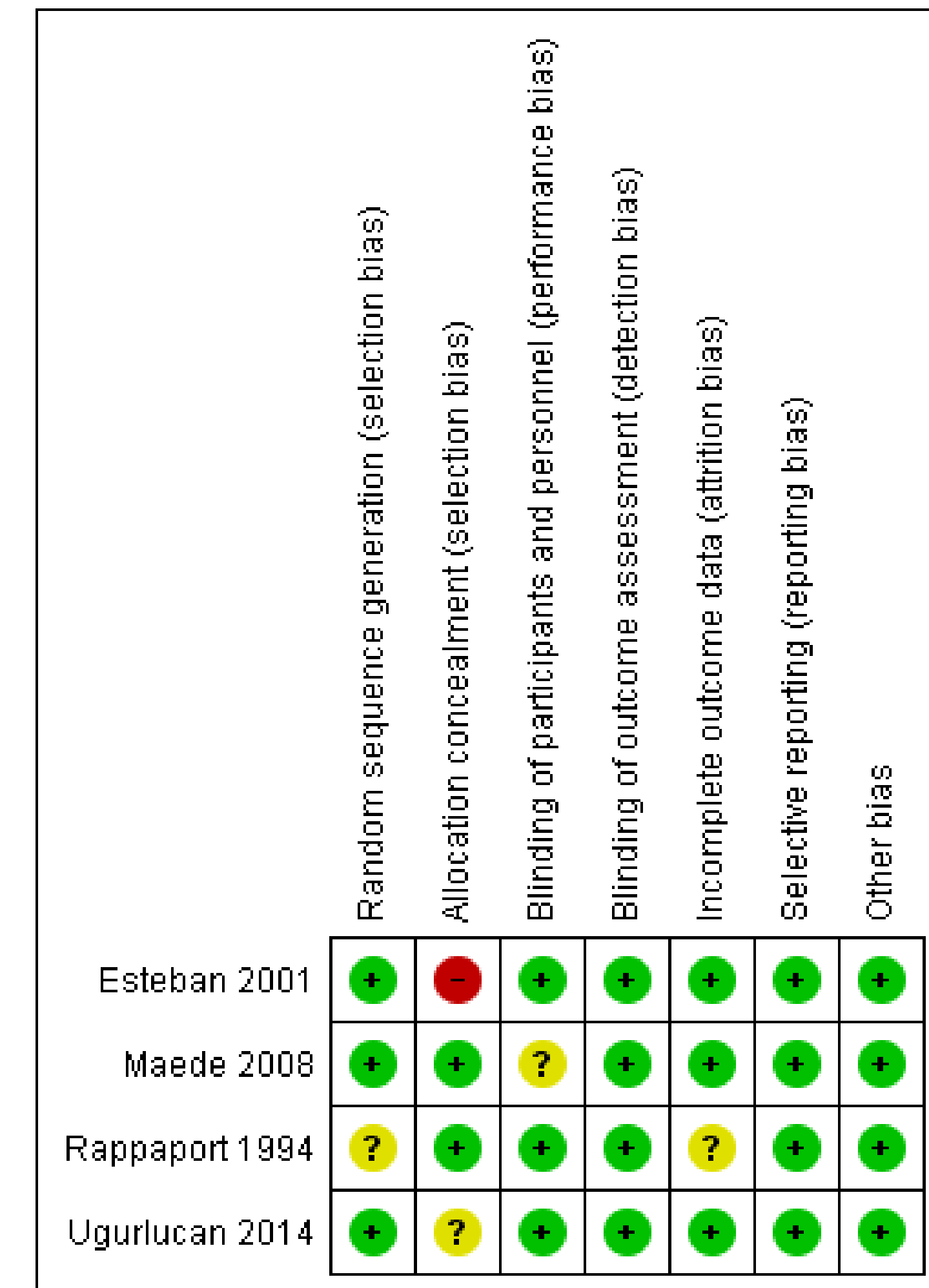
### Forrest plot of barotrauma



### Forrest plot of in-hospital mortality



### Risk of bias assessment



### References

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