

Comparing the efficacy of remimazolam and midazolam for procedural sedation, a meta-analysis

Ian Winkeler BS¹, Zhaosheng Jin MBBS²; Mingxi Zhu, MD²; Shaji Poovathoor, MD²; Sergio Bergese, MD²; Joy Schabel, MD²

1. Renaissance School of Medicine at Stony Brook University, Stony Brook, NY, 11794

2. Department of Anesthesiology, School of Medicine, Stony Brook University, Stony Brook, NY, 11794

INTRODUCTION

- In 2010, over 100,000 bronchoscopies and 7 million gastrointestinal endoscopies were performed in the U.S. These procedures are performed under moderate to deep sedation and fast turnover rates are desirable.
- Remimazolam is metabolized by liver carboxylesterase and has shorter distribution and elimination half-lives than midazolam; remimazolam may be easier to titrate to effect and achieve faster recovery times.
- In the following meta-analysis, we sought to assess the efficacy of remimazolam compared to midazolam across multiple trials and types of procedures

METHODS

- We systematically searched PubMed for clinical trials as of July 7th, 2024 that compared remimazolam and midazolam for procedural sedation that met the following criteria:

Inclusion criteria

- P: Randomized controlled trials of adult patients undergoing procedures
- I: Remimazolam as primary sedative
- C: Midazolam as primary sedative
- O: Time for sedation onset, time for emergence from sedation, risk of needing to abort procedure, risk of needing to administer rescue medication

Exclusion criteria

- Studies involving procedures that featured intubation or LMA insertion
- Pediatric studies

- The data was analyzed using Review Manager V5.3. For continuous variables, we calculated mean differences (MD) by inverse-variance method. For dichotomous variables, we calculated the risk ratios (RRs) by Mantel-Haenszel method.

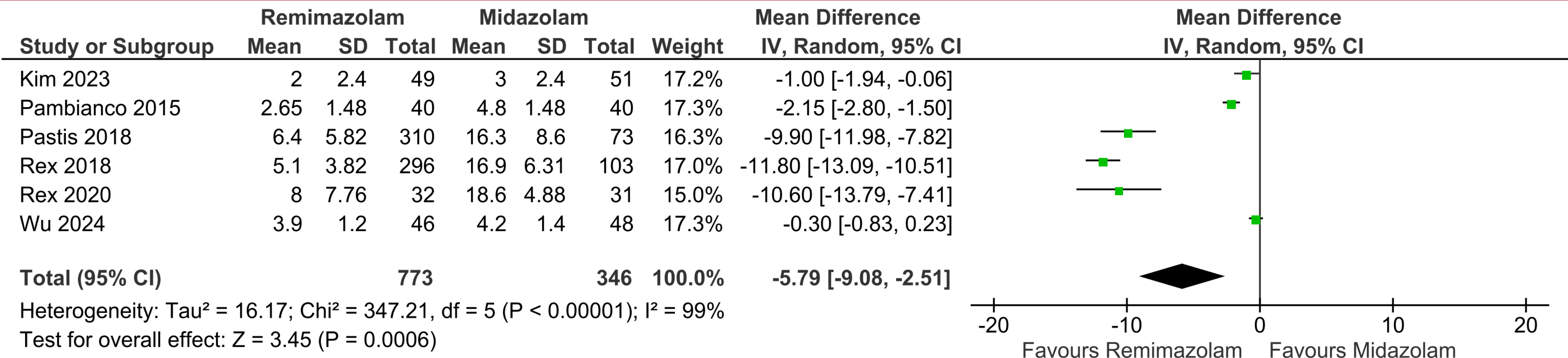


Fig 1 Forest plot of time to sedation onset (values given in minutes)

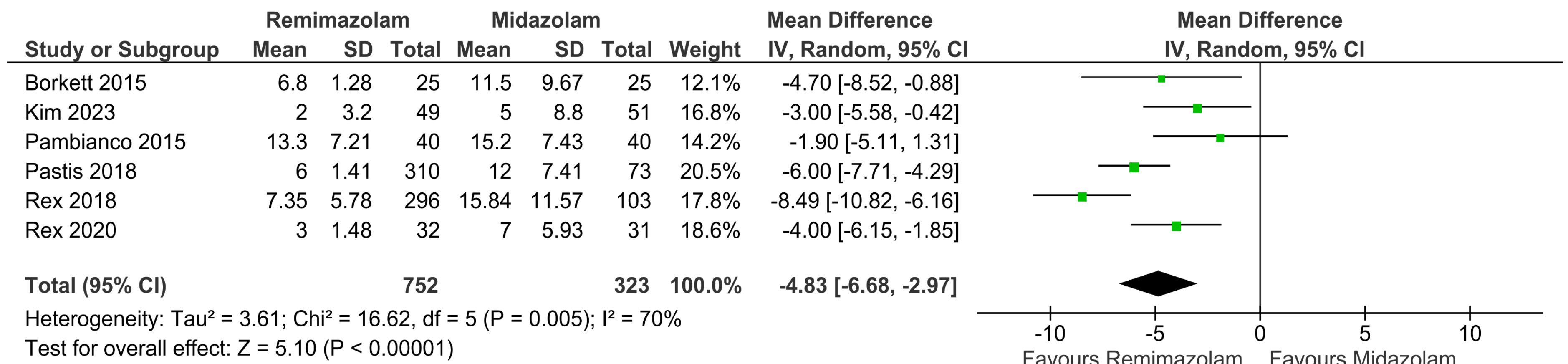


Fig 2 Forest plot of time for emergence from sedation (values given in minutes)

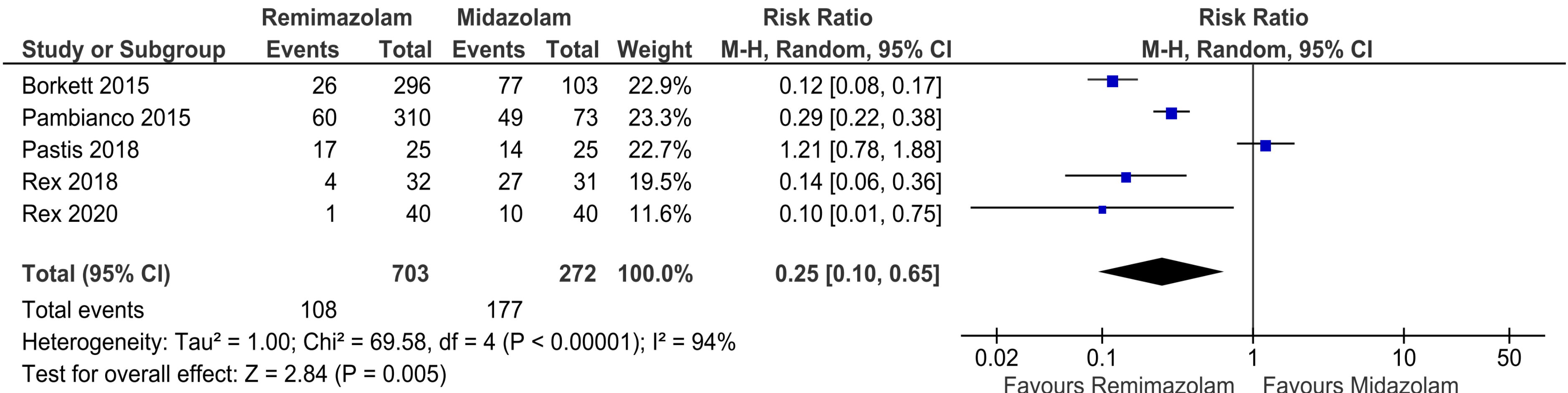


Fig 3 Forest plot for risk of procedure abortion

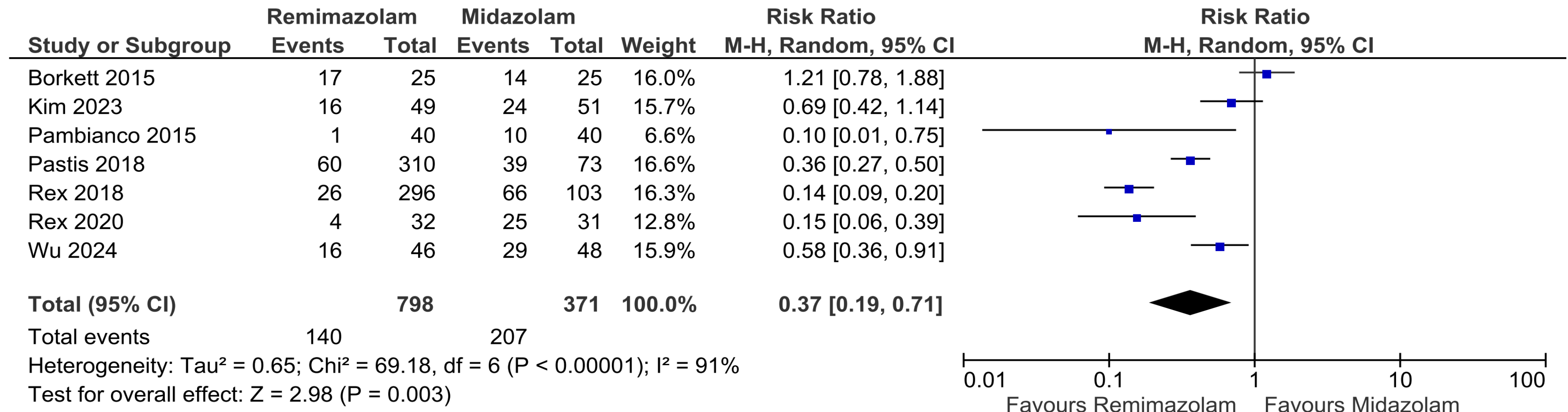


Fig 4 Forest plot for risk of administration of rescue medication

RESULTS

- Seven RCTs spanning three different types of procedures were included. 371 patients and 928 patients were sedated with midazolam and remimazolam, respectively.
- Pooled analysis indicated a decreased time for sedation onset (Fig 1), time to emerge from sedation (Fig 2), risk of procedure abortion (Fig 3), and need to administer rescue sedative (Fig 4) for remimazolam compared to midazolam.

CONCLUSIONS & DISCUSSION

- Remimazolam outperformed midazolam in all four outcomes, suggesting that remimazolam may be a suitable alternative for midazolam for these procedures.
- Though differences in risk for procedure abortion and need for rescue sedative are important, differences in only a few minutes of onset and offset time may not translate to clinical significance.
- In 5 of the 7 studies, fentanyl or alfentanil was administered prior to either remimazolam or midazolam. Sedative interactions between benzodiazepines and fentanyl may partially explain the variability between studies.

REFERENCES

References available on request, correspondence to ian.winkeler@stonybrookmedicine.edu