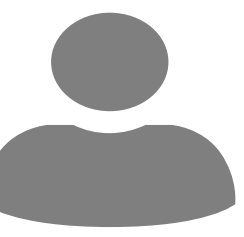


Transversus Thoracic Plane Block versus IV Opioid for Analgesia for Pediatric Cardiac Surgery: A Systematic Review and Meta-Analysis

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BACKGROUND

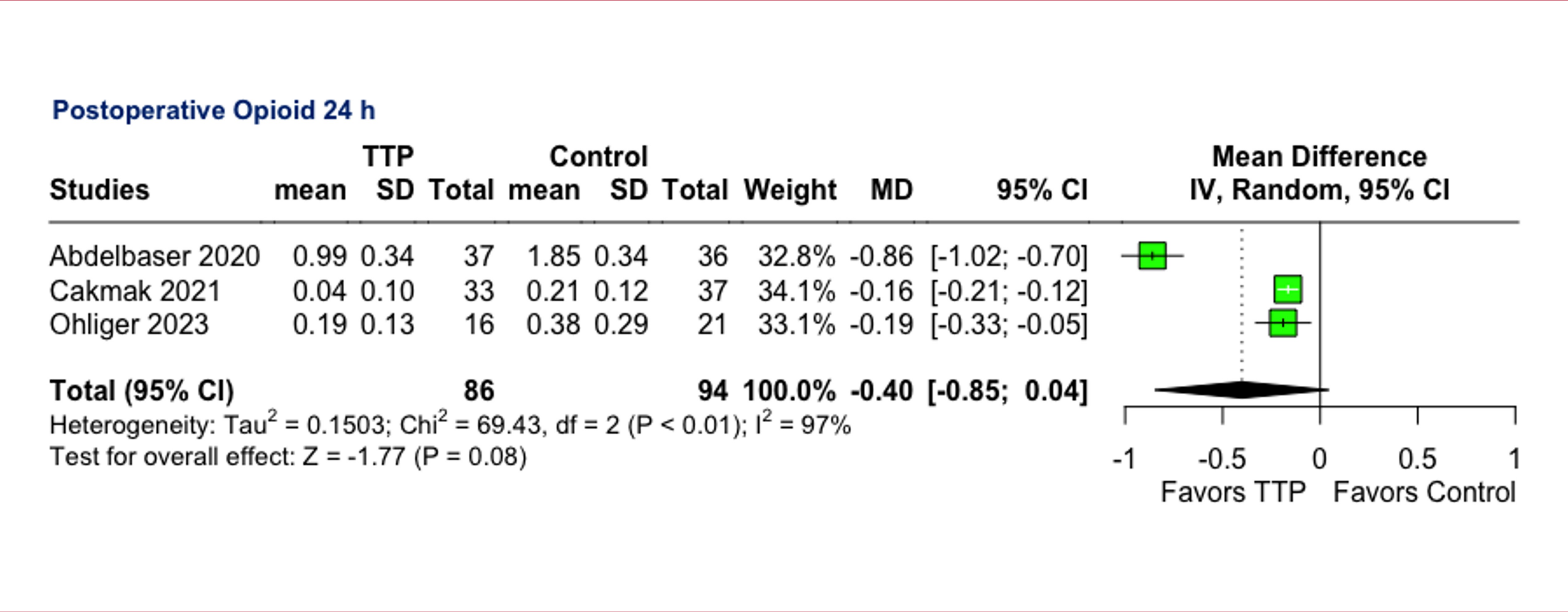
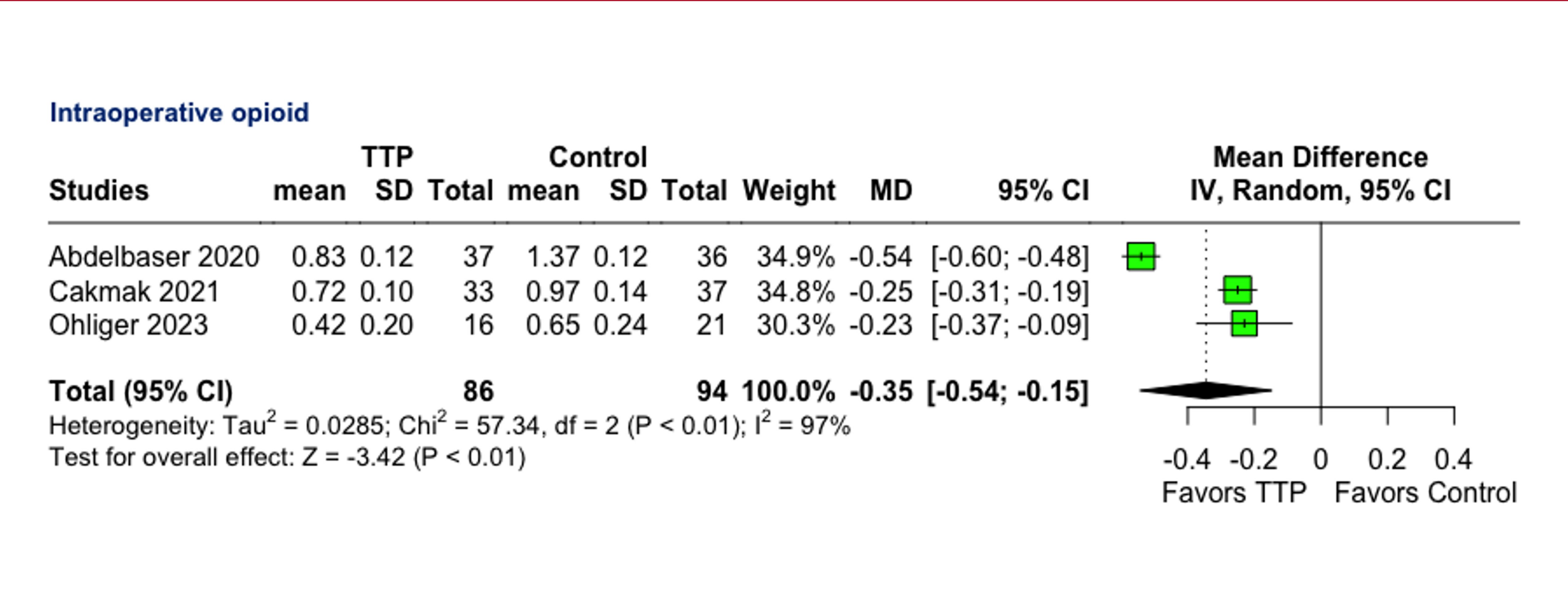
Cardiac surgeries via median sternotomy often cause significant postoperative pain, highlighting the need for effective management strategies. Traditional opioid reliance, despite effectiveness, brings side effects like nausea and respiratory depression. Recent ultrasound-guided regional anesthesia advances offer less invasive, targeted pain control. Introduced in 2015, the transversus thoracis muscle plane (TTP) block targets the Th2 to Th6 intercostal nerves, potentially reducing opioid use and hospital stay in pediatric cardiac surgery patients.

METHODS

Systematic searches in PubMed, EMBASE, and Cochrane Library identified studies on TTP block versus placebo or IV analgesia for pediatric cardiac surgeries. Using Rstudio 4.2.3 and Paule-Mandel for analysis, we assessed heterogeneity (Cochran Q, I2) and bias (RoB-2, ROBINS-I). Sensitivity was checked with the leave-one-out method, and opioids were normalized to morphine equivalents.

Conclusion

TTP block does not reduce postoperative opioid consumption but provides a statistically and clinically significant decrease in the intraoperative opioid requirements. This discrepancy may be attributed to the block's duration, which is effective for intraoperative analgesia but insufficient to extend its analgesic benefits into the postoperative period.



RESULTS

One randomized and two observational studies with 180 patients were reviewed; 86 received TTP block. The mean age was 52 months, nearly half were female. TTP block significantly reduced intraoperative opioid consumption (MD -0.35 mg/Kg; 95% CI -0.54 to -0.15; p < 0.01; I2 = 97%). No significant differences were observed in postoperative opioid use within 24 hours (MD -0.40 mg/Kg; 95% CI -0.85 to 0.04; p = 0.08; I2 = 97%) or ICU stay length (MD 0.05 day; 95% CI -0.59 to 0.69; p = 0.88; I2 = 85%).

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