



Intrathecal Morphine vs Paravertebral Block in ERACS: A Retrospective Study on Postoperative Pain and Outcomes

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INTRODUCTION

- Enhanced Recovery after Cardiac Surgery (ERACS) guidelines endorse multimodal analgesia but lack consensus on opioid sparing strategies^[1].
- Intrathecal morphine (ITM) in cardiac surgery reduces postoperative pain scores, opioid use, length of stay and pulmonary complications^[2-3].
- Paravertebral block (PVB), an established technique first described in 1905, is effective in cardiothoracic surgery, but comparative data with ITM remains limited.

AIM

- Primary aim was to retrospectively evaluate the efficacy of ITM versus PVB on post-operative pain and opioid consumption.
- Secondary aim was to evaluate both interventions on secondary outcomes from the Society of Thoracic Surgery (STS) cardiac surgical database.

METHODS

- Single center retrospective analysis of adult patients undergoing elective cardiac surgery with a sternotomy,
- Review of postoperative pain scores and opioid consumption, measured as oral morphine equivalents (OME).
- Adjusted linear mixed models assessed intervention-pain outcome relationships.
- Statistical analyses were conducted using Mann-Whitney U and Chi-square tests.

RESULTS

Demographics

- Total of 82 patients between September 2023 and July 2024
- 22 male (26.8%) vs 60 female (73.2%)
- Median age 68 (57.25 – 73)
- PVB cohort: 40 (48.8%)
- ITM cohort: 42 (51.2%)

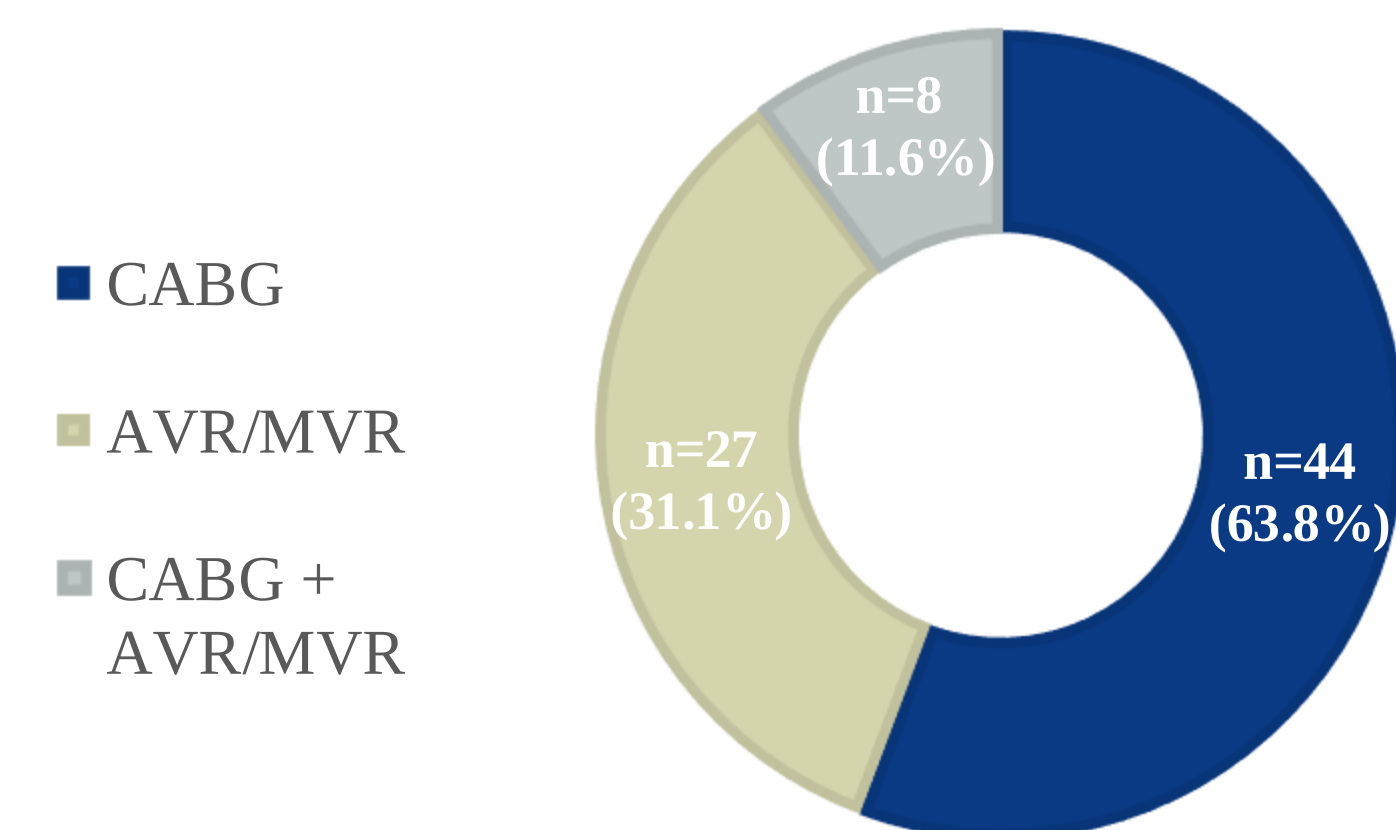


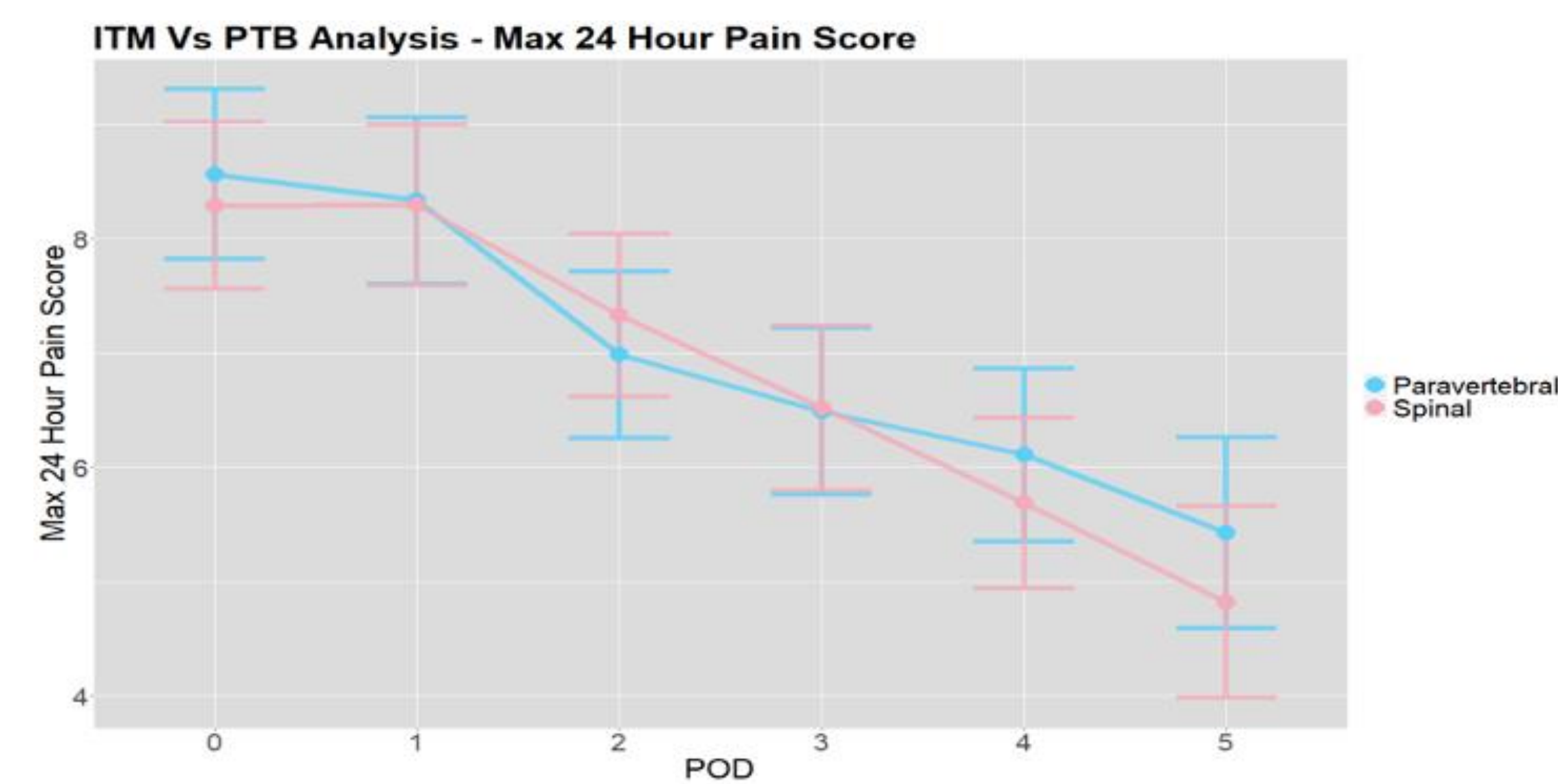
Fig 1: Distribution of procedures: Coronary Artery Bypass graft (CABG), Aortic valve repair (AVR) and Mitral valve repair (MVR)

Postoperative Pain

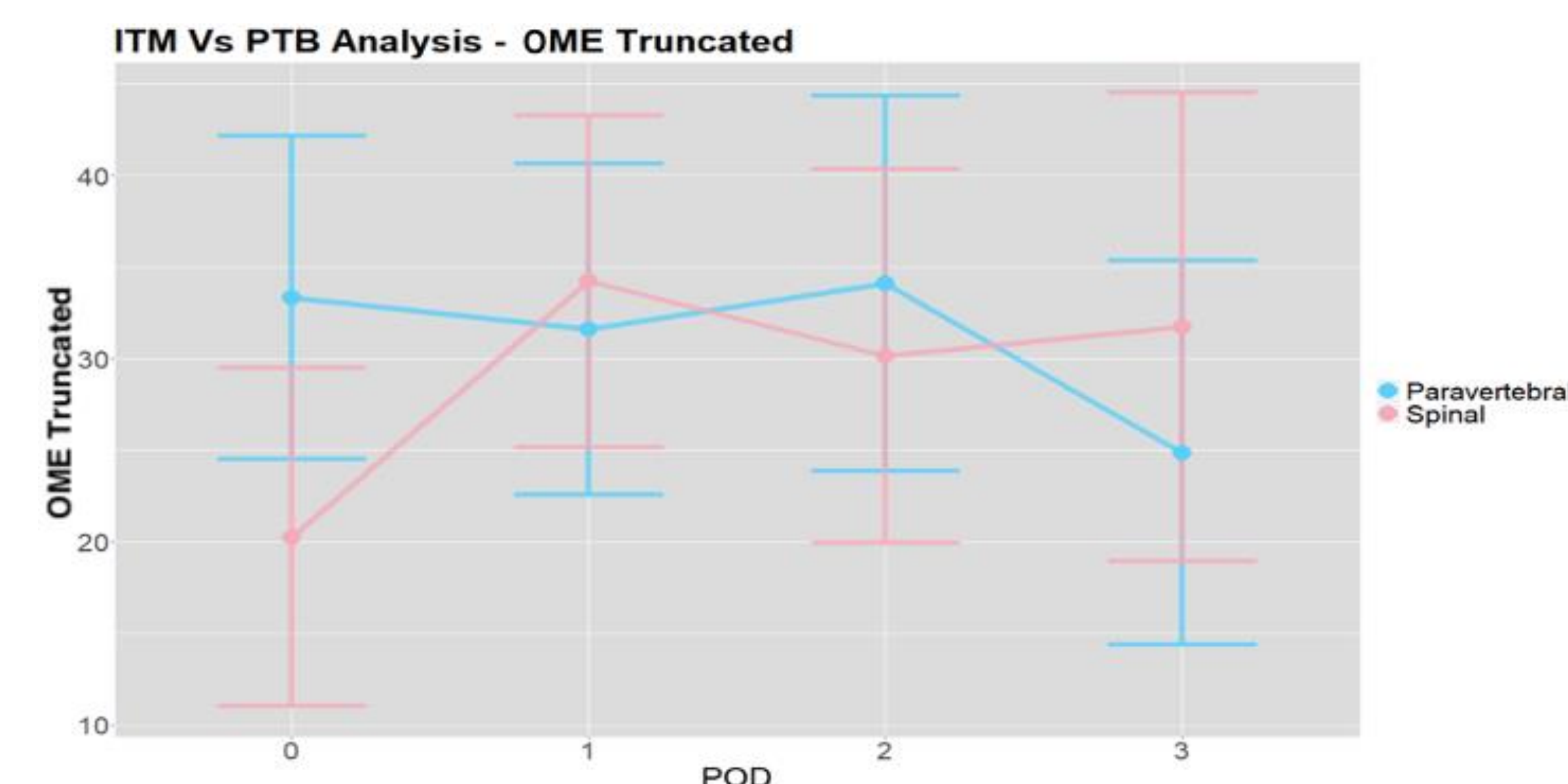
- Pain Scores
 - POD2 Median pain scores: 7 in PVB vs 8 in ITM (p 0.007)
 - No difference observed on other post operative days
- Opioid Consumption
 - Median OME on POD 0: PVB 28.8, 16.1 ITM (p 0.009)
 - No difference in OME on other post operative days

Secondary STS Outcomes

- Time to extubation
 - No clinically significant difference in time to extubation (Overall median: 3.22h [2.34-4.76])
- ICU and total in hospital length of stay (LOS)
 - No clinically significant difference in postoperative ICU stay (Overall median: 54.15h [45-90.55])
 - No clinically significant difference in total hospital length of stay (LOS) (Overall median LOS of 6.13 [5.08 - 7.65])
- Rate of complications
 - Rate of complications did not significantly differ
 - 42% in PVB group vs 40% in ITM group (p.0.852)



Graph 1 (top): Median maximum 24-hour pain scores over five postoperative days, comparing the trends between ITM vs PVB groups.



Graph 2 (bottom): Median opioid consumption measured in oral morphine equivalents (OME) over five postoperative days comparing ITM vs PVB groups.

CONCLUSION

- ITM and PVB demonstrated comparable effectiveness in pain control and postoperative analgesia requirements among patients undergoing cardiac surgery.
- No significant difference in opioid consumption, length of hospital stay, or complication rates between both groups.
- PVB may be a preferred modality due to its less invasive nature and ease of execution.

REFERENCES

- Shaw AD et al. Perioperative Quality Initiative (POQI) and Enhanced Recovery after Surgery–Cardiac (ERAS→Cardiac) investigators. Controversies in enhanced recovery after cardiac surgery. *Perioper Med (Lond)*. 2022 Apr 28;11(1):19
- Santos LM et al. Intrathecal morphine plus general anesthesia in cardiac surgery: effects on pulmonary function, postoperative analgesia, and plasma morphine concentration. *Clinics (Sao Paulo)*. 2009;64(4):279-85.
- Dhawan R, et al. Intrathecal Morphine for Analgesia in Minimally Invasive Cardiac Surgery: A Randomized, Placebo-controlled, Double-blinded Clinical Trial. *Anesthesiology*. 2021 Nov 1;135(5):864-876.



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