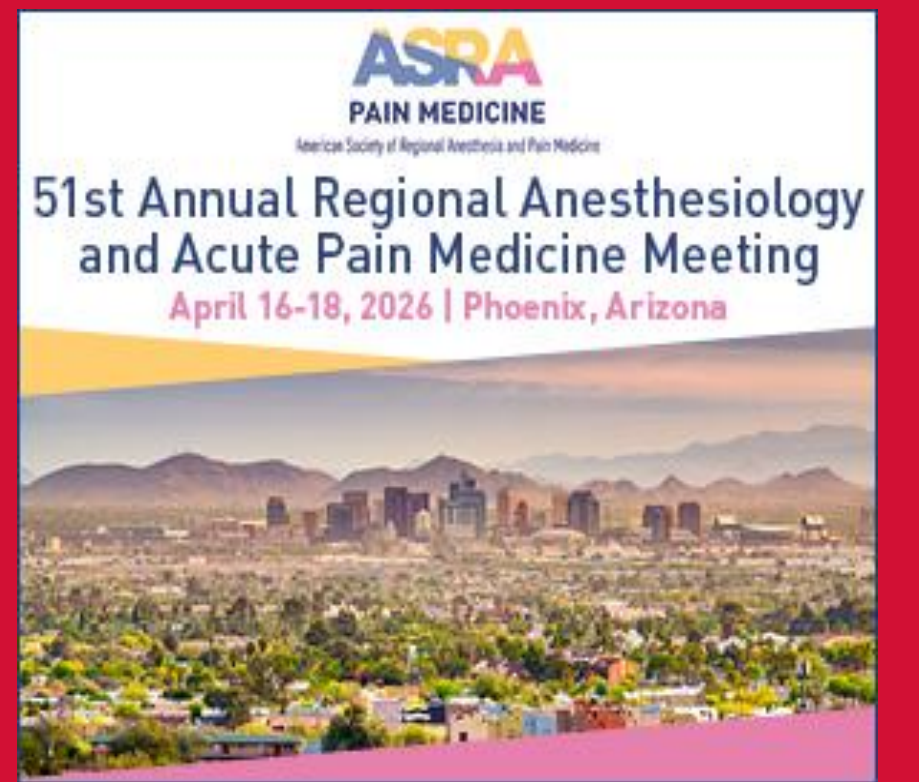


Preoperative vs Postoperative Transverse Abdominal Plane Blocks for Renal Surgery: A Systematic Review and Network Meta-Analysis

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INTRODUCTION

- The **transversus abdominis plane (TAP) block** is an ultrasound-guided technique that provides abdominal wall analgesia by depositing local anesthetic between the internal oblique and transversus abdominis muscles. In patients with **renal dysfunction or renal allografts**, concerns about nephrotoxicity often limit analgesic options and increase reliance on opioids. **TAP blocks reduce postoperative pain and opioid use**, but the optimal timing of administration remains unclear.
- We performed a **network meta-analysis to evaluate outcomes according to the timing of TAP block administration**.

MATERIALS & METHODS

- The protocol was registered on **OSF prior to data collection** (<https://osf.io/xqs34/overview>)
- This study was reported in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) 2020 guidelines.
- Two independent reviewers screened studies from MEDLINE, Embase, CENTRAL, and ClinicalTrials.gov. **Randomized controlled trials involving adult patients undergoing donor nephrectomy or renal transplantation** were included.
- The **primary outcomes** were **24-hour postoperative opioid consumption (MME)** and **VAS pain scores at 24 hours**.
- Studies were categorized by **preoperative versus postoperative TAP block administration**, and **indirect comparisons were performed**.

RESULTS

- Seven studies met the inclusion criteria (**5 preoperative TAP, 2 postoperative TAP**) (Figure 1). **Statistical heterogeneity was substantial** across analyses ($I^2 > 75\%$).
- For **24-hour opioid consumption**, preoperative TAP block did not significantly reduce opioid use compared with control (**MD -4.07 MME; 95% CI -10.05 to 1.91 ; $p=0.181$**). In contrast, postoperative TAP block was associated with a significant reduction in opioid consumption (**MD -14.66 MME; 95% CI -17.40 to -11.91 ; $p < 0.001$**). Indirect comparison demonstrated **lower opioid consumption with postoperative compared with preoperative TAP block** (Figure 2).
- For **VAS pain scores at 24 hours**, postoperative TAP significantly reduced pain compared with control (**MD -0.548 ; 95% CI -0.706 to -0.390 ; $p < 0.001$**), whereas preoperative TAP showed no significant difference (**MD -0.087 ; 95% CI -0.267 to 0.093 ; $p = 0.342$**).

Figure 1. Prisma flow diagram of screening process

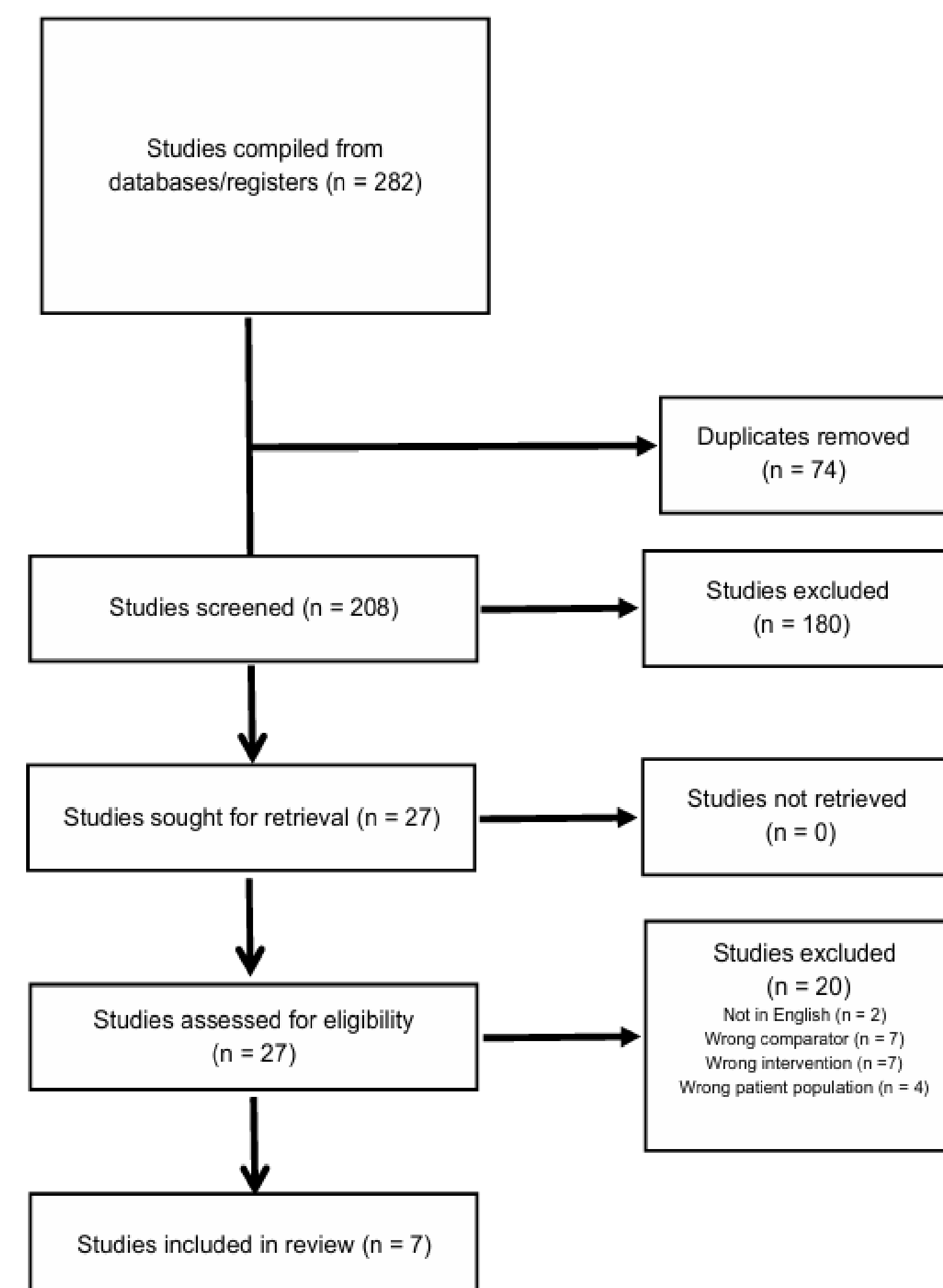
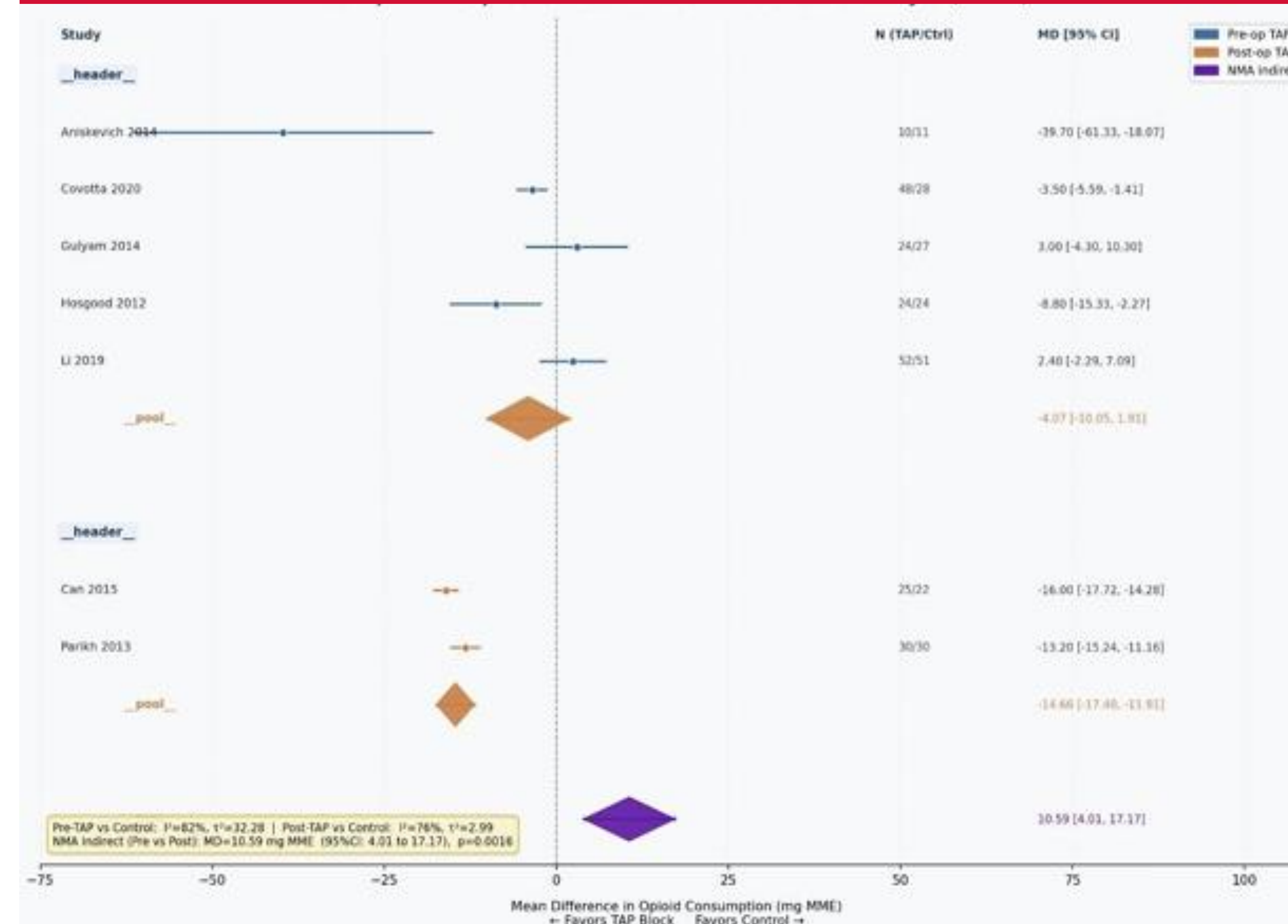


Figure 2. Pre vs Post Op TAP Block 24 Hour Opioid Consumption in MME



DISCUSSION

- Possible explanations for the greater effectiveness of **postoperative TAP blocks** include **intraoperative surgical manipulation dispersing local anesthetic administered preoperatively**, reducing its duration of action.
- Postoperative blocks are performed closer to the time of pain assessment, which may enhance their apparent analgesic effect. Additionally, somatic incisional pain is often more clearly perceived after surgery, potentially increasing the observed benefit of postoperative administration.

Take Away Point

Postoperative TAP blocks were associated with lower 24-hour opioid consumption and pain scores compared with control, while preoperative TAP blocks did not show a significant benefit.

Timing of TAP block administration may influence analgesic effectiveness, suggesting postoperative placement may provide greater measurable benefit in renal surgery.

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