



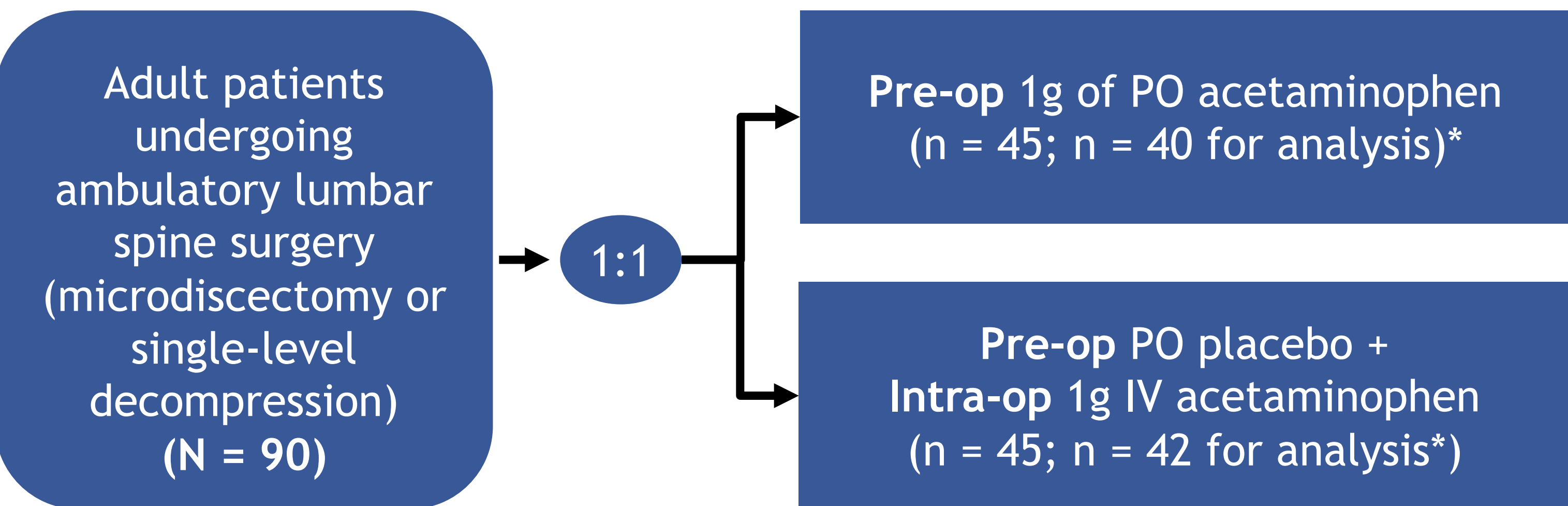
Introduction

- Lumbar spine surgery is associated with moderate to high levels of pain, which if untreated can lead to prolonged length of stay.¹
- Multimodal analgesia including acetaminophen has been recommended and endorsed by a consensus panel.²
- IV acetaminophen could have clinical advantages over the PO form, but prospective comparative studies in spine surgery are lacking.
- We conducted a randomized controlled trial (RCT) comparing IV to PO acetaminophen in ambulatory lumbar spine surgery and hypothesized that IV acetaminophen would improve analgesia and quality of recovery.

Methods

- From 3/2021 - 10/2023, adult patients undergoing ambulatory lumbar spine surgery were randomized to receive either: 1) 1 g of PO acetaminophen preoperatively without IV placebo or 2) 1 g IV acetaminophen intraoperatively with PO placebo preoperatively

Study Schema



- 5 patients excluded from PO analysis due to missing intra-op and post-op data, 3 patients in IV arm excluded due to missing intra-op and post op data.
- 3 patients in IV arm inadvertently received PO drug, but were analyzed based on the intent-to-treat principle.

- The primary endpoint:** 24-hour post-operative opioid usage in IV morphine mg equivalents (MME)
- Secondary endpoints:** 30-minute, 60-minute, and PACU discharge numerical rating scale (NRS) pain ratings (0-10), quality of recovery (QoR)-15 survey scores at 24 hours, PACU LOS, and correlation analysis between pain catastrophizing scale (PCS) scores and pain outcomes

Results

- Baseline characteristics were relatively balanced amongst arms (**Table 1**)
- There was **no significant difference in the primary endpoint of 24-hour median post-operative opioid consumption** (13 [4, 27] MME versus 12 [4, 30] MME, p=0.893 for IV and PO groups, respectively; **Table 2**).
- There were no differences in the secondary endpoints of NRS pain ratings at 30 minutes, 60 minutes, and PACU discharge.
- QoR-15 scores at 24 hours did not differ between groups at baseline or 24 hours postoperatively but did change from pre- to post-operative assessment in the PO group (**Figure 1**).

Table 1. Baseline Characteristics

	IV acetaminophen (n = 42)	Oral acetaminophen (n = 40)
Mean Age (SD) in years	50 (14)	52 (14)
Sex, n (%)		
Female	15 (35.7)	8 (20.0)
Male	27 (64.3)	32 (80.0)
Race, n (%)		
White	38 (90.5)	38 (95.0)
Black	2 (4.8)	1 (2.5)
Asian	2 (4.8)	0
Other	0	1 (2.5)
Mean BMI (SD) in kg/m ²	28.9 (4.6)	29.3 (4.8)
ASA physical status, n (%)		
1	12 (28.6)	5 (12.5)
2	25 (59.5)	23 (57.5)
3	5 (11.9)	12 (30.0)
Location, n (%)		
Ambulatory Surgery Center	30 (71.4)	31 (77.5)
Academic Medical Center	12 (28.6)	9 (22.5)
Mean (SD) PCS score	19 (13)	24 (12)

Figure 1. Quality of Recovery-15 scores at baseline (pre-operative) and 24 hours (post-operative)

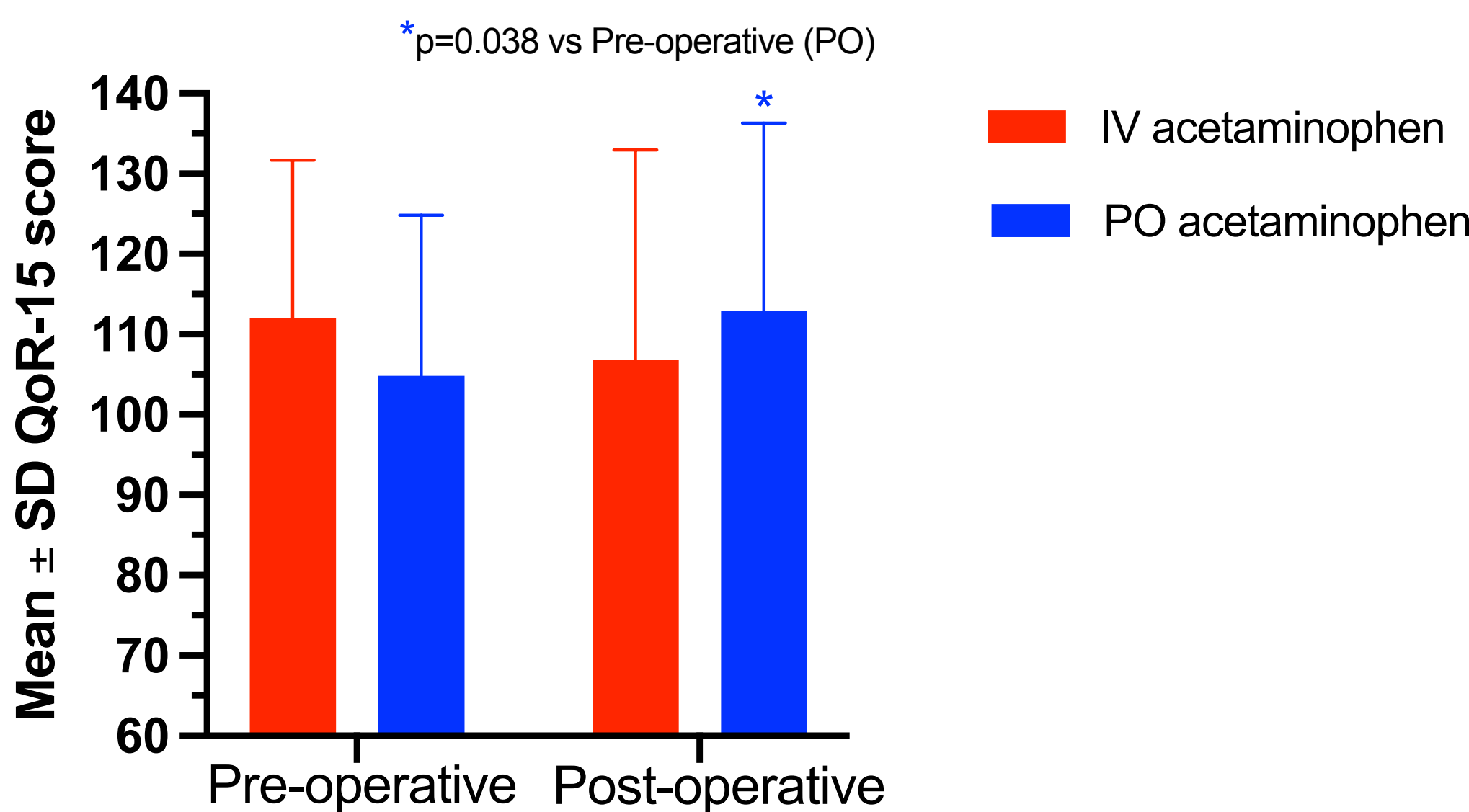


Table 2. Intra- and Post-Operative Outcomes

	IV acetaminophen (n = 42)	Oral acetaminophen (n = 40)	P value
Median [IQR] MME at 24 h, mg#	13 [4, 27]	12 [4,30]	0.893
Median [IQR] Intra-op MME, mg#	16 [11, 18]	18 [10, 23]	0.251
Intra-op ketorolac, n (%)	28 (66.7)	25 (62.5)	0.693
Intra-op local anesthetic wound infiltration, n (%)	18 (42.9)	16 (40.0)	0.793
Mean (SD) NRS pain rating post-op (0-10)			
30 min	4.6 (3.3)	3.6 (3.4)	0.368
60 min	4.2 (2.7)	4.3 (2.8)	
PACU discharge	3.7 (2.3)	3.4 (2.3)	
24 hours	4.2 (2.4)	3.7 (2.5)	
Mean (SD) QoR-15 score at 24 h	107 (26)	113 (23)	0.272
Mean (SD) PACU LOS in minutes	127 (49)	143 (64)	0.203

#Opioids were converted to IV morphine equivalents using a table from Sinatra RS, de Leon-Casasola OA, Viscusi ER, Ginsberg B, eds. Acute Pain Management. New York, NY: Cambridge University Press, 2009.

Conclusions

- Our study found no clinically meaningful differences between IV and PO acetaminophen in ambulatory spine surgery, including the QoR-15, a patient-centered outcome, and discharge times were not faster with IV acetaminophen
- Our results contrast those of Hansen et al.,³ who reported superior outcomes for IV acetaminophen, but agreed with a recent meta-analysis that concluded that IV acetaminophen offers no advantages over PO acetaminophen.⁵
- IV acetaminophen should be reserved for patients unable to take oral medications

References

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