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# Comparative Evaluation Of Two Different Doses Of Pre-Emptive Oral Pregabalin On Duration Of Spinal Anesthesia And Reduction Of Postoperative Pain

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## I. Introduction

Effective management of postoperative pain remains a cornerstone of perioperative care, particularly in patients undergoing lower limb and lower abdominal surgeries. Inadequately controlled pain can lead to delayed recovery, increased opioid consumption, higher risk of chronic pain syndromes, and patient dissatisfaction. Therefore, anesthesiologists continuously explore strategies to prolong the duration of spinal anesthesia and reduce reliance on postoperative opioids

Pregabalin, a structural analog of gamma-aminobutyric acid (GABA), is classified as a gabapentinoid. It binds to the α2δ subunit of presynaptic voltage-gated calcium channels, thereby reducing excitatory neurotransmitter release and modulating nociceptive transmission. While initially approved for neuropathic pain and epilepsy, pregabalin has emerged as a valuable agent in multimodal perioperative analgesia. When given preemptively, it can attenuate central sensitization, prolong spinal anesthesia, and reduce postoperative pain intensity.

Subarachnoid block is the most widely used regional anesthetic procedure for infra-umbilical surgery. It provides rapid onset, consistent sensory and motor blockade with adequate muscle relaxation for all types of surgery below the level of umbilicus.

The current study aims to compare the efficacy of two different oral pregabalin doses (75 mg vs. 150 mg) given preemptively before spinal anesthesia. The primary endpoints assessed were duration of sensory and motor blockade, postoperative visual analogue scale (VAS) scores, time to first rescue analgesia, and total opioid consumption in the first 24 hours.

## II. Methods

Study Design: This was a prospective, randomized, double-blind, comparative clinical study conducted in adult patients undergoing elective lower abdominal or lower limb surgeries under spinal anesthesia.

Sample Size Calculation: Based on Hulley's formula for correlation studies, with $\alpha = 0.05$, $\beta = 0.20$, and an anticipated correlation coefficient of 0.36, the smallest required sample size was calculated to be 58. Considering a 5% dropout rate, the final recruitment target was 60 patients (30 per group).

$C = 0.5 * \ln (1+r)/(1-r)] = 0.3769$

Total sample size = $N = [(Za+Zg)/C|2 + 3 = 58$

Participants:

- Inclusion criteria: Adults undergoing elective lower limb or lower abdominal surgery under spinal anesthesia.
- Exclusion criteria: Allergy to pregabalin, contraindication to spinal anesthesia, renal/hepatic dysfunction, chronic analgesic use, or refusal to participate.

-After obtaining approval and clearance from the institutional ethics committee, the patients fulfilling the inclusion criteria were enrolled for the study after obtaining informed consent.

-Patient was shifted to operation theatre and basic standard monitors are connected (Pulse oximetry, NIBP, ECG). Baseline parameters are recorded and monitored. Intravenous line was secured with 18G cannula. IV crystalloid fluid Ringer lactate was given at rate of 10ml/kg.

-Under strict aseptic technique with 25 G Quincke spinal needle was used for spinal anesthesia in all study subjects by an anesthesiologist in the sitting position at the level of L2-L3 or L3-L4 intervertebral space. After observing free flow of transparent cerebrospinal fluid, the intrathecal drug was injected. Then, patient's was positioned to supine and supplemental oxygen was initiated at rate of 4 liters per minute.

-The level of sensory block was assessed bilaterally in midclavicular line, by loss of pinprick sensation to 23-gauge hypodermic needle and dermatomes levels was tested every 2 min until the adequate level required for surgery. The motor dermatome level was assessed using Modified Bromage scale.

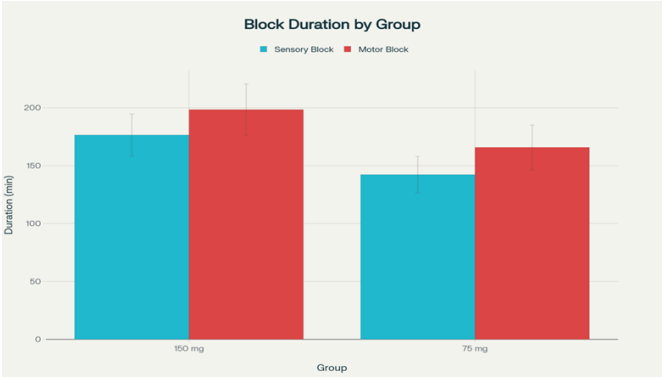
Group Allocation:
- Group A: Received 75 mg oral pregabalin preoperatively 60 mins before spinal anaesthesia with sips of water.
- Group B: Received 150 mg oral pregabalin preoperatively 60 mins before spinal anaesthesia with sips of water.

Outcomes Measured:
1. Duration of sensory block (onset to regression to S1 dermatome).
2. Duration of motor block (onset to Bromage score 0).
3. Time to first rescue analgesic (minutes from block administration to first analgesic request).
4. Total opioid requirement within 24 hours (tramadol and paracetamol equivalents).
5. Pain intensity using the Visual Analogue Scale (VAS) at 1, 2, 4, 8, 12, and 24 hours.
6. Side effects (nausea, vomiting, dizziness, sedation, respiratory depression).

## III. Results

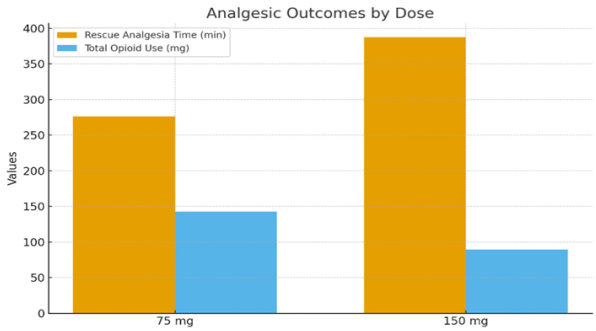
Duration of Block:
- Sensory Block: Group B (150 mg) – 176.5±18.2 min ($p<0.001$) vs. Group A (75 mg) – 142.3±15.7 min ($p<0.001$).
- Motor Block: Group B – 198.4±22.1 min vs. Group A – 165.8±19.3 min. ($p<0.001$)

| Dose | Sensory block (min) | Motor block (min) | Time for first rescue analgesia (min) | Total 24 hrs opioid use (mg) | VAS score | Side effects |
|---|---|---|---|---|---|---|
| 75 mg | 142.3±15.7 | 165.8±19. | 276.2±32. | 142.7±35. | Higher | Nil |
| 150 mg | 176.5±18.2 | 198.4±22. | 387.6±45. | 89.5±28. | Lower | Nil |




The higher dose significantly prolonged both sensory and motor blockade.

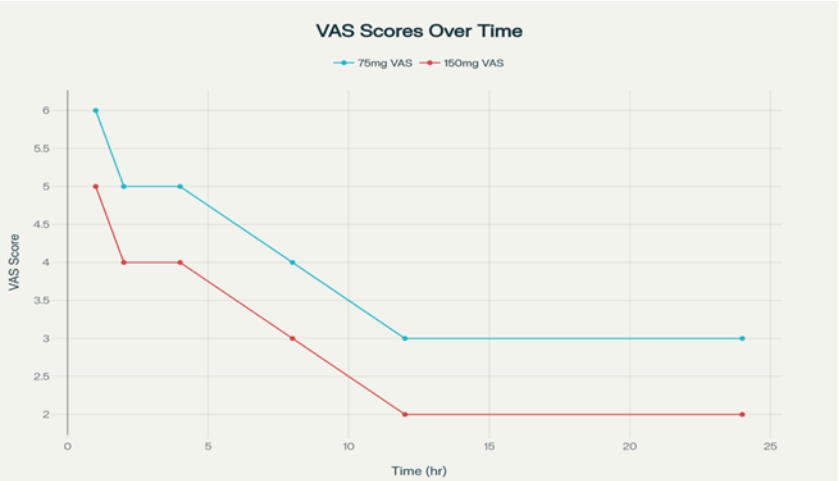
Analgesic Outcomes




Postoperative Analgesia:
- Time to First Rescue Analgesia: Group B – 387.6±45.8 min vs. Group A – 276.2±32.4 min. ($p<0.001$)
- Opioid Consumption (24h): Group B – 89.5±28.3 mg vs. Group A – 142.7±35.6 mg.
Patients receiving 150 mg required fewer opioids and had a longer pain-free interval.

Pain Scores (VAS):
VAS scores were consistently lower in Group B at all measured time points. Example: At 8 hours, VAS was 4 (75 mg) vs. 3 (150 mg); at 24 hours, 3 (75 mg) vs. 2 (150 mg). ($p<0.05$)

| Time (hr) | 75mg VAS | 150mg VAS |
|---|---|---|
| 1 | 6 | 5 |
| 2 | 5 | 4 |
| 4 | 5 | 4 |
| 8 | 4 | 3 |
| 12 | 3 | 2 |
| 24 | 3 | 2 |




This says superior analgesic effect with the higher dose.

Side Effects: Both groups tolerated pregabalin well. No major adverse effects such as excessive sedation, respiratory depression, or dizziness were reported.

## IV. Discussion

This study demonstrates that preemptive administration of 150 mg oral pregabalin is superior to 75 mg in prolonging spinal anesthesia and improving postoperative analgesia. The results are consistent with earlier trials and meta-analyses, which confirm pregabalin's role in reducing postoperative pain intensity and opioid requirements without a significant increase in adverse effects

Clinical Implications:
- Enhanced recovery: Prolonged sensory and motor blockade reduces the need for supplemental analgesics in the immediate postoperative period.
- Opioid-sparing effect: Lower opioid consumption is particularly beneficial in minimizing opioid-related adverse effects such as nausea, vomiting, and respiratory depression.
- Patient comfort: Better pain scores contribute to improved patient satisfaction and early mobilization.

Comparison with Literature:
- Jokela et al. (2016) and Omara et al. (2019) also found pregabalin effective in prolonging spinal anesthesia duration.
- Zhang et al. (2011) meta-analysis confirmed that pregabalin significantly reduces postoperative opioid requirement.
This study strengthens the evidence base by directly comparing two clinically relevant doses.

## V. Conclusion

Preemptive oral pregabalin at a dose of 150 mg provides superior analgesic benefits compared to 75 mg in patients undergoing lower limb and abdominal surgeries under spinal anesthesia. It prolongs sensory and motor blockade, delays the need for rescue analgesia, and reduces opioid consumption, without adding significant adverse effects. Thus, 150 mg pregabalin can be recommended as an effective adjunct in multimodal perioperative pain management.

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