

Comparison of Pregabalin Versus Gabapentin Premedication for Post Operative Analgesia in Patients Undergoing Surgeries Below Umbilicus Under Spinal Anaesthesia – A Randomized Double-Blind Study

Pavan Kumar^{1*}, Anil Babu Swarna², R. Srihari Charan Thej³, Mayana Ayesha Khanam⁴

1. Assistant Professor, Apollo Institute of Medical Sciences and Research, Chittoor, Andhra Pradesh, India. Email: pavanraja@gmail.com (*Corresponding Author)
2. Associate Professor, Department of Anaesthesiology, Apollo Institute of Medical Sciences and Research, Chittoor, Andhra Pradesh, India.
3. Postgraduate, Department of Anaesthesiology, Apollo Institute of Medical Sciences and Research, Chittoor, Andhra Pradesh, India.
4. Assistant Professor, Department of Anaesthesiology, Apollo Institute of Medical Sciences and Research, Chittoor, Andhra Pradesh, India.

Received: 18th Aug, 2026 | Revised: 28th Aug, 2026 | Accepted: 2nd Sep, 2026 | Available Online: 27th Sep, 2026

ABSTRACT:

Background: Preoperative gabapentinoids may reduce postoperative pain and opioid requirements, but their comparative efficacy during spinal anaesthesia remains uncertain. This study compared oral pregabalin and gabapentin as preoperative analgesic adjuncts in elective infraumbilical surgery.

Methods: This prospective comparative study included 70 ASA I–II patients undergoing elective infraumbilical procedures under spinal anaesthesia. Patients were allocated to receive either pregabalin 150 mg (Group P, n=35) or gabapentin 300 mg (Group G, n=35) orally 30 minutes before surgery. Postoperative VAS scores were recorded up to 24 hours. Time to first rescue analgesia, 24-hour tramadol consumption, and adverse effects were assessed.

Results: Baseline demographic characteristics, comorbidities, ASA status, and operative duration were comparable between groups. Group P had a significantly longer time to first rescue analgesia than Group G (400.86 ± 83.43 vs 109.86 ± 33.24 minutes; $p < 0.001$). Mean tramadol consumption during the first 24 hours was significantly lower with pregabalin (157.14 ± 50.21 mg) than with gabapentin (280.00 ± 40.58 mg; $p < 0.001$). VAS scores were lower in Group P immediately after surgery and at 30 minutes, 1 hour, 3 hours, and 18 hours ($p < 0.001$ at each interval). Nausea occurred less frequently in Group P than in Group G (5.7% vs 25.7%; $p = 0.045$), while giddiness was comparable between groups.

Conclusion:

Pregabalin 150 mg administered before surgery provided longer postoperative analgesia, reduced tramadol requirement, and better early pain control than gabapentin 300 mg in patients undergoing infraumbilical surgery under spinal anaesthesia.

Keywords: Pregabalin; Gabapentin; Postoperative pain; Spinal anaesthesia; Preoperative analgesia.

How to cite this article: Pavan Kumar. Comparison of Pregabalin Versus Gabapentin Premedication for Post Operative Analgesia in Patients Undergoing Surgeries Below Umbilicus Under Spinal Anaesthesia – A Randomized Double-Blind Study. Int J Drug Deliv Technol. 2026;16(81s):1606-1613. DOI: 10.25258/ijddt.16.81s.194.

INTRODUCTION:

Postoperative pain remains a major concern after surgery and, when inadequately controlled, may delay mobilisation, impair recovery, and increase analgesic requirements. Surgical tissue injury can enhance nociceptive transmission and central sensitisation, providing a rationale for administering analgesic agents before the surgical stimulus. Pregabalin and gabapentin, structural analogues of gamma-aminobutyric acid, reduce excitatory neurotransmitter

release through modulation of voltage-gated calcium channels and are increasingly used as perioperative adjuncts.[1,2] Previous studies have shown that both agents can reduce postoperative pain and opioid consumption, although their relative benefit varies with dose, type of surgery, and anaesthetic technique .[3–7] Evidence directly comparing these drugs in patients receiving spinal anaesthesia remains limited. Therefore, this prospective comparative

Comparison of Pregabalin Versus Gabapentin Premedication for Post Operative Analgesia in Patients Undergoing Surgeries Below Umbilicus Under Spinal Anaesthesia – A Randomized Double-Blind Study

study evaluated oral pregabalin 150 mg and gabapentin 300 mg given before elective infraumbilical surgery under spinal anaesthesia, with emphasis on postoperative pain scores, time to first rescue analgesia, tramadol consumption, and drug-related adverse effects during the first 24 hours.

AIM AND OBJECTIVES

Aim

To assess whether preoperative pregabalin or gabapentin provides better postoperative pain relief in adults undergoing elective infraumbilical surgery under spinal anaesthesia.

Objectives

1. To compare pain scores, time until the first request for rescue analgesia, and total tramadol requirement during the first 24 postoperative hours.
2. To assess and compare perioperative haemodynamic changes and adverse effects, including nausea, vomiting, dizziness, and sedation.

Materials and Methods

Study design and setting

This prospective, interventional, comparative study was conducted in the Departments of General Surgery and Anaesthesiology at Apollo Institute of Medical Sciences and Research Hospital and District Headquarters Hospital, Chittoor. The study was carried out over 18 months, from 1 May 2023 to 31 October 2024, after approval from the Institutional Ethics Committee [approval number and date]. Written informed consent was obtained from all participants.

Participants

Seventy adult patients scheduled for elective infraumbilical surgery under spinal anaesthesia were enrolled using convenience sampling. Patients aged 18–65 years, of either sex, with ASA physical status I or II and a body mass index of 18–35 kg/m² were eligible.

Patients were excluded if they refused consent; had a known allergy to pregabalin or gabapentin; were receiving either drug for another indication; had chronic pain or regular analgesic use; or had a history of drug or alcohol abuse. Additional exclusion criteria included epilepsy or other neurological disorders, cardiac disease, hepatic, renal, or pulmonary dysfunction, pregnancy or breastfeeding, a previous

history of postoperative nausea, vomiting, dizziness, or headache, and failed spinal anaesthesia or any contraindication to spinal anaesthesia.

Group allocation and premedication

After preanaesthetic evaluation, participants were allocated equally into two groups of 35 patients each [specify the randomisation and allocation-concealment method].

- Group P received oral pregabalin 150 mg 30 minutes before surgery.
- Group G received oral gabapentin 300 mg 30 minutes before surgery.

Patients were familiarised with the visual analogue scale (VAS) before surgery.

Anaesthetic technique

Baseline heart rate, systolic blood pressure, diastolic blood pressure, respiratory rate, oxygen saturation, and electrocardiographic findings were recorded before surgery. In the operating theatre, standard monitoring with electrocardiography, non-invasive blood pressure monitoring, and pulse oximetry was continued. Intravenous access was secured with an 18-gauge cannula, and Ringer's lactate solution at 10 mL/kg was administered before spinal anaesthesia.

Under aseptic precautions, subarachnoid block was performed at the L4–L5 interspace using a 25-gauge Quincke needle. Hyperbaric 0.5% bupivacaine was administered intrathecally [specify volume and total dose]. Haemodynamic parameters were monitored throughout surgery. On completion of the procedure, patients were observed in the postanaesthesia care unit or postoperative ward.

Outcome assessment

Postoperative pain was assessed using the VAS immediately after surgery and at 30 minutes, 1, 3, 6, 12, 18, and 24 hours. Intravenous tramadol 2 mg/kg was administered as rescue analgesia when the VAS score was 4 or more. Time to first rescue analgesia, calculated from the end of surgery, and cumulative tramadol consumption during the first 24 postoperative hours were recorded.

The primary outcomes were postoperative VAS scores, time to first rescue analgesia, and total tramadol consumption during the first 24 hours. Secondary outcomes included perioperative haemodynamic changes and adverse effects, namely nausea, vomiting, dizziness, and sedation.

Statistical analysis

Comparison of Pregabalin Versus Gabapentin Premedication for Post Operative Analgesia in Patients Undergoing Surgeries Below Umbilicus Under Spinal Anaesthesia – A Randomized Double-Blind Study

Data were analysed using [statistical software and version]. Continuous variables were expressed as mean $\pm$ standard deviation, while categorical variables were summarised as frequency and percentage. Between-group comparisons for continuous variables were performed using Welch's independent-samples t-test. Categorical variables were compared using the chi-square test or Fisher's exact test, where appropriate. VAS scores at individual postoperative time points were compared using the Mann-Whitney U test, and within-group changes in VAS scores over time were assessed using the Friedman test. A two-sided p-value of less than 0.05 was considered statistically significant.

OBSERVATION AND RESULTS

Seventy patients were included in the analysis, with 35 patients allocated to each group. Baseline characteristics were similar between groups. There were no statistically significant differences in age distribution, mean age, body mass index, comorbidity profile, ASA physical status, or operative duration (all $p > 0.05$). All participants in the present dataset were male.(Table 1-3) The mean surgical duration was 63.00 ± 16.32 minutes in the pregabalin group and 64.57 ± 15.21 minutes in the gabapentin group ($p = 0.678$). (Table 4)

Patients who received pregabalin experienced a substantially longer duration of postoperative analgesia than those who received gabapentin, with the first requirement for rescue analgesia occurring at 400.86 ± 83.43 minutes and 109.86 ± 33.24 minutes, respectively ($p < 0.001$). (Table 5) Pregabalin was associated with lower VAS scores immediately after surgery and at 30 minutes, 1 hour, 3 hours, and 18 hours postoperatively ($p < 0.001$ at each interval). At 6 hours, however, the mean VAS score was higher in the pregabalin group than in the gabapentin group (4.49 ± 0.51 vs 3.97 ± 0.71 ; $p = 0.002$). Pain scores at 12 and 24 hours were comparable between groups. VAS scores changed significantly over the 24-hour observation period in both groups (Friedman test, $p < 0.001$). (Table 6)

Rescue analgesic consumption was significantly lower among patients receiving pregabalin. The mean tramadol requirement during the first 24 hours was 157.14 ± 50.21 mg in the pregabalin group compared with 280.00 ± 40.58 mg in the gabapentin group ($p < 0.001$). (Table 7) Nausea was reported

less often with pregabalin than with gabapentin, occurring in 5.7% and 25.7% of patients, respectively ($p = 0.045$). Although giddiness was less frequent in the pregabalin group (14.3%) than in the gabapentin group (22.9%), the difference was not statistically significant ($p = 0.540$). (Table 8)

Table 1. Comparison of age distribution between the study groups

Characteristic	Pregabalin (n = 35)	Gabapentin (n = 35)	p-value
Age group, years; n (%)			0.148
18–30	12 (34.3)	13 (37.1)	
31–40	4 (11.4)	7 (20.0)	
41–50	4 (11.4)	9 (25.7)	
51–60	9 (25.7)	3 (8.6)	

Comparison of Pregabalin Versus Gabapentin Premedication for Post Operative Analgesia in Patients Undergoing Surgeries Below Umbilicus Under Spinal Anaesthesia – A Randomized Double-Blind Study

	7)		
>60	6 (1 7. 1)	3 (8 .6)	

Table 2: Comparison of mean age and BMI between the groups

Ch ara cte rist ic	P re g a b a l i n (n = 3 5)	G a b a p e n t i n (n = 35)	p - v a l u e
Ag e(y ear s)	4 2. 5 1 ± 1 5. 7 2	39 .0 3 ± 12 .0 7	0 .3 0 2
BM I (kg /m ²)	2 8. 3 7 ± 3. 1 0	29 .2 5 ± 2. 53	0 .2 0 1

Table 3. Distribution of comorbidities

Co mo rbi dit y	P re g a b a l i n (n = 3 5)	G a b a p e n t i n (n =3 5)	p - v a l u e
No	1	17	0

co mo rbi dit y	5 (4 2. 9)	(4 8. 6)	. 9 2 8
T2 D M onl y	7 (2 0. 0)	5 (1 4. 3)	
Hy per ten sio n onl y	5 (1 4. 3)	5 (1 4. 3)	
T2 D M wit h hy per ten sio n	8 (2 2. 9)	8 (2 2. 9)	

Table 4. ASA distribution and duration of surgery

Ch ara cte rist ic	P re g a b a l i n (n = 3 5)	G a b a p e n t i n (n = 35)	p - v a l u e
AS A I; n (%)	1 5 (4 2. 9)	16 (4 5. 7)	0 .8 1 0
AS A II; n	2 0 (5	19 (5 4. 3)	

Comparison of Pregabalin Versus Gabapentin Premedication for Post Operative Analgesia in Patients Undergoing Surgeries Below Umbilicus Under Spinal Anaesthesia – A Randomized Double-Blind Study

(%)	7.1)		
Duration of surgery, min	63.00 ± 16.32	64.57 ± 15.21	0.678

Table 5. Duration of postoperative analgesia

Outcome	Pregabalin (n = 35)	Gabapentin (n = 35)	p-value
Time to first rescue analgesia, min	40.86 ± 83.43	109.86 ± 33.24	< .001

Table 6. Mean VAS scores during the postoperative period

T	Pr	Ga	p
---	----	----	---

Time after surgery	Pregabalin (n = 35)	Gabapentin (n = 35)	p-value
0 min	1.40 ± 0.50	2.14 ± 0.69	< .001
30 min	1.54 ± 0.51	3.00 ± 0.59	< .001
1 h	2.29 ± 0.46	4.17 ± 0.38	< .001
3 h	3.54 ± 0.51	4.83 ± 0.38	< .001
6 h	4.49 ± 0.51	3.97 ± 0.71	0.002
12 h	4.23 ± 1.09	4.60 ± 0.60	0.160
18 h	3.77 ± 0.73	4.46 ± 0.82	< .001

Comparison of Pregabalin Versus Gabapentin Premedication for Post Operative Analgesia in Patients Undergoing Surgeries Below Umbilicus Under Spinal Anaesthesia – A Randomized Double-Blind Study

2	4.	4.6	0
4	34	0 ±	.
h	±	0.6	1
	0.	9	3
	48		3

Table 7. Comparison of 24-hour tramadol requirement

O u t c o m e	Pr eg ab ali n (n =35)	Ga ba pe nti n (n =35)	p - v a l u e
T o t a l t r a m a d o l c o n s u m e d	15 7. 14 ± 50 .2 1	28 0.0 0 ± 40. 58	< 0 . 0 0 1

Table 8. Comparison of nausea and giddiness

A d v e r s e e f f e c t	Pr eg ab ali n (n =35)	Ga ba pe nti n (n =35)	p - v a l u e
N a u s e a	2 (5. 7)	9 (25 .7)	0 . 0 4 5

G i d d i n e s s	5 (1 4. 3)	8 (22 .9)	0 . 5 4 0
---	---------------------	-----------------	-----------------------

Discussion Effective postoperative pain control is central to early mobilisation, patient comfort, and recovery after surgery. The concept of administering an analgesic before surgical stimulation is based on the possibility of reducing peripheral and central sensitisation. Woolf and Chong described this principle as preemptive analgesia, where intervention before nociceptive input may attenuate the amplification of pain after surgery.[8] Gabapentin and pregabalin are gabapentinoids that have therefore been evaluated as components of perioperative multimodal analgesia. In their systematic-narrative review, Dauri et al. reported that both drugs could reduce postoperative pain and opioid consumption when compared with placebo, although the magnitude of benefit differed across surgical procedures and study protocols.[1] In the present study, preoperative pregabalin 150 mg produced a markedly longer pain-free interval than gabapentin 300 mg. The mean time to first rescue analgesia was 400.86 ± 83.43 minutes in the pregabalin group, compared with 109.86 ± 33.24 minutes in the gabapentin group. This finding is consistent with the study by Bafna et al., who observed that both agents prolonged postoperative analgesia after surgery under spinal anaesthesia, but that pregabalin provided a greater extension of the analgesic period than gabapentin.[9] The direction of benefit is also similar to that reported by Acharya et al. in lower-limb orthopaedic procedures under spinal anaesthesia. Using the same doses as the present study, they found that pregabalin 150 mg prolonged postoperative analgesia more effectively than gabapentin 300 mg.[10] The reduced need for rescue analgesia further supports the superior analgesic profile observed with pregabalin in this study. Mean tramadol consumption during the first 24 hours was significantly lower in the pregabalin group than in the gabapentin group (157.14 ± 50.21 mg vs 280.00 ± 40.58 mg; p<0.001). Bafna et al. similarly reported lower

postoperative rescue analgesic requirements with pregabalin than with gabapentin .[9] Ghai et al. also found pregabalin to be superior to gabapentin after abdominal hysterectomy under subarachnoid block, with lower postoperative analgesic requirements in the pregabalin group.[11] In lower-limb orthopaedic surgery performed under combined spinal-epidural anaesthesia, Khetarpal et al. demonstrated a longer analgesic duration and fewer epidural rescue top-ups with pregabalin than with gabapentin.[12] Although their doses and anaesthetic technique differed from those used in the present study, their findings support the same overall clinical pattern. Postoperative VAS scores were lower in the pregabalin group during the early postoperative period, particularly from the immediate postoperative assessment through 3 hours. This is clinically relevant because the early period after regression of spinal anaesthesia is often associated with increasing pain and the need for rescue medication. Sebastian et al. reported that preoperative pregabalin 150 mg provided effective postoperative analgesia in lower-limb orthopaedic surgery under spinal anaesthesia.[5] Rajappa et al. also observed lower pain scores and reduced rescue analgesic requirements with pregabalin premedication in women undergoing vaginal hysterectomy .[13] The present findings therefore extend evidence for pregabalin to a broader infraumbilical surgical population.

An interesting observation was the higher VAS score in the pregabalin group at 6 hours, while VAS scores at 12 and 24 hours did not differ significantly between groups. This isolated reversal should be interpreted in the context of the rescue-analgesia protocol. Patients in the gabapentin group required rescue tramadol much earlier and in larger amounts; their 6-hour pain score may therefore have been influenced by more frequent or recent tramadol administration. Thus, the serial VAS values should be interpreted together with time to rescue analgesia and cumulative tramadol use, rather than as independent measures. The substantially longer analgesic duration and lower total tramadol requirement in the pregabalin group provide stronger evidence of its overall opioid-sparing effect.

Gabapentin nevertheless demonstrated clinically useful analgesic activity. Tomar et al. found that preemptive gabapentin improved postoperative analgesia after infraumbilical surgery under subarachnoid block when compared with placebo[4] . Similar benefits of gabapentin, including reductions in pain scores and rescue analgesic requirement, were reported by Parikh et al. after abdominal surgery under general anaesthesia [3] , by Dierking et al. after abdominal hysterectomy[14] , and by Pandey et al.[15] after laparoscopic cholecystectomy. Therefore, the present results should not be interpreted as indicating that gabapentin is ineffective. Rather, at the doses studied, pregabalin 150 mg was associated with a more favourable postoperative analgesic profile than gabapentin 300 mg.

The adverse-effect profile was acceptable in both groups. Nausea occurred significantly less frequently with pregabalin than with gabapentin, whereas giddiness was numerically lower in the pregabalin group but did not differ significantly. Acharya et al. reported comparable postoperative nausea and vomiting with pregabalin and gabapentin, with minor effects such as dizziness and sedation occurring in both groups.[10] In contrast, Rajappa et al. noted that dizziness increased with higher pregabalin doses, even though analgesic efficacy also improved.[13] The absence of a significant difference in giddiness in the present study may be related to the use of a single 150 mg dose of pregabalin. This dose appears to offer a practical balance between analgesic benefit and tolerability.

The available literature does not show identical benefits in every surgical setting. For example, Clarke et al. did not find an additional benefit from gabapentin when it was added to a multimodal regimen after total hip arthroplasty[16] . Tiippana et al. likewise emphasised that the perioperative effects and adverse events of gabapentinoids vary according to drug dose, timing, surgery, and concurrent analgesic regimen.[17] These differences may explain variation between published studies and reinforce the need to interpret individual trial results within their clinical setting.

CONCLUSION:

In this study, patients who received pregabalin before spinal anaesthesia had a longer period of pain relief and required less tramadol during the first postoperative day than those who received gabapentin. Pregabalin also offered better control of pain during the early postoperative hours and was associated with fewer episodes of nausea. As giddiness was similar in both groups, preoperative pregabalin 150 mg appears to be a well-tolerated and effective analgesic adjunct

Comparison of Pregabalin Versus Gabapentin Premedication for Post Operative Analgesia in Patients Undergoing Surgeries Below Umbilicus Under Spinal Anaesthesia – A Randomized Double-Blind Study

for elective infraumbilical surgery under spinal anaesthesia.

REFERENCES:

1. Dauri M, Faria S, Gatti A, Celidonio L, Carpenedo R, Sabato A. Gabapentin and pregabalin for the acute postoperative pain management: a systematic-narrative review of the recent clinical evidence. *Curr Drug Targets*. 2009;10:716-33.
2. Kushwaha BB, Singh S, Srivastava VK, Prakash R, Verma R, Verma S. A randomized, double-blind, prospective study to evaluate the effect of oral pregabalin in upper limb surgeries under brachial plexus block. *Cureus*. 2022;14:e29117.
3. Parikh HG, Dash SK, Upasani CB. Study of the effect of oral gabapentin used as preemptive analgesia to attenuate postoperative pain in patients undergoing abdominal surgery under general anesthesia. *Saudi J Anaesth*. 2010;4:137-41.
4. Tomar GS, Singh F, Cherian G. Role of preemptive gabapentin on postoperative analgesia after infraumbilical surgeries under subarachnoid block: a randomized, placebo-controlled, double-blind study. *Am J Ther*. 2019;26:e350-7.
5. Sebastian B, Talikoti AT, Nelamangala K, Krishnamurthy D. Effect of oral pregabalin as preemptive analgesic in patients undergoing lower limb orthopedic surgeries under spinal anaesthesia. *J Clin Diagn Res*. 2016;10:UC01-4.
6. Şen H, Sızlan A, Yanarateş Ö, Şenol MG, İnangil G, Sücüllü I, et al. The effects of gabapentin on acute and chronic pain after inguinal herniorrhaphy. *Eur J Anaesthesiol*. 2009;26:772-6.
7. Routray SS, Pani N, Mishra D, Nayak S. Comparison of pregabalin with gabapentin as preemptive analgesic in lumbar spine surgery. *J Anaesthesiol Clin Pharmacol*. 2018;34:232-6.
8. Woolf CJ, Chong MS. Preemptive analgesia: treating postoperative pain by preventing the establishment of central sensitization. *Anesth Analg*. 1993;77:362-79.
9. Bafna U, Rajarajeshwaran K, Khandelwal M, Verma AP. A comparison of effect of preemptive use of oral gabapentin and pregabalin for acute postoperative pain after surgery under spinal anesthesia. *J Anaesthesiol Clin Pharmacol*. 2014;30:373-7.
10. Acharya U, Ghimire A, Bhattarai B, Singh SN, Prasad JN, Maharjan R. Preemptive use of oral gabapentin or pregabalin for acute postoperative pain following lower limb orthopaedic surgery under spinal anaesthesia. *J Kathmandu Med Coll*. 2019;8:3-7.
11. Ghai A, Gupta M, Hooda S, Singla D, Wadhera R. A randomized controlled trial to compare pregabalin with gabapentin for postoperative pain in abdominal hysterectomy. *Saudi J Anaesth*. 2011;5:252-7.
12. Khetarpal R, Kataria AP, Bajaj S, Kaur H, Singh S. Gabapentin vs pregabalin as a premedication in lower limb orthopaedic surgery under combined spinal epidural technique. *Anesth Essays Res*. 2016;10:262-7.
13. Rajappa GC, Vig S, Bevanaguddaiah Y, Anadaswamy TC. Efficacy of pregabalin as premedication for postoperative analgesia in vaginal hysterectomy. *Anesth Pain Med*. 2016;6:e34591.
14. Dierking G, Duedahl TH, Rasmussen ML, Fomsgaard JS, Møiniche S, Rømsing J, et al. Effects of gabapentin on postoperative morphine consumption and pain after abdominal hysterectomy: a randomized, double-blind trial. *Acta Anaesthesiol Scand*. 2004;48:322-7.
15. Pandey CK, Priye S, Singh S, Singh U, Singh RB, Kumar Singh P. Preemptive use of gabapentin significantly decreases postoperative pain and rescue analgesic requirements in laparoscopic cholecystectomy. *Can J Anaesth*. 2004;51:358-63.
16. Clarke H, Pereira S, Kennedy D, Andrion J, Mitsakakis N, Gollish J, et al. Adding gabapentin to a multimodal regimen does not reduce acute pain, opioid consumption or chronic pain after total hip arthroplasty. *Acta Anaesthesiol Scand*. 2009;53:1073-83.
17. Tiippana EM, Hamunen K, Kontinen VK, Kalso E. Do surgical patients benefit from perioperative gabapentin/pregabalin? A systematic review of efficacy and safety. *Anesth Analg*. 2007;104:1545-56.