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Original Research Article

Pudendal Nerve Block with Bupivacaine Vs Bupivacaine Plus Steroid on Reducing Perianal Pain After Hemorrhoidectomy

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Abstract: *Postoperative pain management in hemorrhoidectomy remains a clinical challenge, with pudendal nerve block (PNB) emerging as an effective technique. Adding steroids to local anaesthetics may enhance analgesic efficacy and prolong pain relief.* ***Objective:*** *To compare the effectiveness of pudendal nerve block (PNB) using bupivacaine alone versus bupivacaine with dexamethasone in reducing perianal pain following hemorrhoidectomy.* ***Methods:*** *A prospective study was conducted at the Department of General Surgery, University of Lahore Teaching Hospital, Lahore, from July 31, 2024, to January 30, 2025. A total of 60 patients undergoing hemorrhoidectomy were randomly assigned into two groups: Group A (n=30) received PNB with 20 mL bupivacaine. Group B (n=30) received PNB with 20 mL bupivacaine and 8 mg dexamethasone. The blocks were performed bilaterally under spinal anaesthesia using anatomical landmarks. All patients received standard postoperative analgesia. Pain scores were recorded at 12 and 24 hours postoperatively using the Visual Analog Scale (VAS). Group comparisons were conducted using the t-test, with statistical significance at $p \leq 0.05$.* ***Results:*** *The mean pain score at 12 hours postoperatively was significantly lower in Group B (1.90 ± 0.481) compared to Group A (2.47 ± 0.681), with a p-value of 0.001, indicating a statistically significant difference in pain relief. The addition of dexamethasone resulted in enhanced and prolonged analgesia without increasing adverse effects.* ***Conclusion:*** *The use of PNB with bupivacaine plus dexamethasone significantly reduces postoperative perianal pain after hemorrhoidectomy compared to bupivacaine alone. This combination provides superior analgesic efficacy and can be considered a safe and effective technique for pain management in perianal surgeries.*

Keywords: Pudendal Nerve Block, Bupivacaine, Steroid, Hemorrhoidectomy, Hemorrhoids, Pain Score, Perianal Pain

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Introduction

Hemorrhoids affect about 5% of the general population, causing symptoms like bleeding, pruritus, prolapse, and pain due to thrombosis or inflammation. Treatment varies depending on haemorrhoid location and severity; for 3rd and 4th-degree cases, hemorrhoidectomy is common but leads to significant postoperative pain, resulting in delayed recovery, longer hospital stays, and increased opioid use, potentially leading to postoperative nausea and vomiting (1-2).

Effective pain management is crucial for patient outcomes and reducing complications. The pudendal nerve, originating from S2, S3, and S4 nerve roots, exits the pelvis via the greater sciatic foramen, passing through ligaments toward the pudendal blood vessels. It re-enters through the lesser sciatic foramen and travels upward along the ischiorectal fossa wall in Alcock's canal. A branch of the pudendal nerve, the inferior rectal nerve, supplies the external anal sphincter and perianal skin (3).

Pudendal Nerve Block (PNB) is commonly used to treat anorectal issues due to its potent pain relief and ability to lessen complications. Patients undergoing PNB experience less discomfort during defecation and quicker recovery. Adding a steroid to the local anaesthesia for PNB helps reduce risks like perianal oedema and haemorrhage compared to using local anaesthesia alone (4). Bupivacaine, a preferred local anaesthetic for pudendal nerve block, eases severe pain by blocking sodium channels and other receptors like NMDA. Combining a steroid with bupivacaine in affected areas can relieve pain by reducing inflammation and prolonging the anaesthetic's effect (3).

The use of bupivacaine with steroids has not been extensively explored in patients undergoing perianal surgeries to reduce post-operative pain. So, we did a pilot study in our ward. In our pilot study conducted at the University of Lahore Teaching Hospital, 30 patients were divided into two groups, i.e. Group A received bupivacaine for the pudendal nerve block. In contrast, Group B received a combination of bupivacaine and steroid. The study indicated that the VAS score after 12 hours was 1.40±0.83 and 0.47±0.64 for Group A and Group B, respectively. It demonstrated the potential benefits of adding a steroid to the bupivacaine in reducing postoperative perianal pain.

Methodology

The study, conducted at the University of Lahore Teaching Hospital's Department of General Surgery from July 31, 2024, to January 30, 2025, obtained ethical approval and written informed consent. It included 60 patients undergoing elective hemorrhoidectomy admitted from the outpatient department. Patients were randomly assigned to two groups: Group A received a pudendal nerve block with 20 mL of 0.5% Bupivacaine. Group B received the same block with 20 mL of 0.5% Bupivacaine plus 8 mg dexamethasone.

The study included 60 patients (30 in each group) aged 18-70 with ASA grade I and II status, undergoing hemorrhoidectomy for third and fourth-degree haemorrhoids. Exclusions were based on acute perianal sepsis, allergies to Bupivacaine or steroids, coagulopathy, anticoagulant therapy, or prior pudendal nerve-affecting surgery. The sample was calculated for 80% power and a 95% CI, assessing VAS pain scores following Bupivacaine alone and with steroids as 1.40 ± 0.83 and 0.47 ± 0.64, respectively, from a pilot study.

The pudendal nerve block was performed bilaterally on a patient in a lithotomy position under spinal anaesthesia. The nerve was located using ischial spine palpation either transvaginally or transrectally, guided by anatomical landmarks. After contacting the spine, a 22-gauge needle was inserted through the perineal skin towards the ischial spine and then

redirected to the pudendal canal. Confirmation of correct needle placement was done through aspiration. An anaesthetic solution (20 mL of 0.5% Bupivacaine for Group A or 20 mL of 0.5% Bupivacaine with 8 mg dexamethasone for Group B) was injected slowly, ensuring even spread. The procedure was repeated on the other side for a complete bilateral pudendal nerve block.

Postoperatively, patients received standard analgesia with Paracetamol every 8 hours. Using the Visual Analogue Scale (VAS) at 12 and 24 hours, pain scores assessed perianal pain on a scale of 0 to 10. SPSS version 25.0 analysed data for age, income, and pain scores by calculating mean and SD. Normality was tested with the Shapiro-Wilk test, reporting median and IQR for non-normally distributed data. Gender, residence, and other factors were represented in frequencies and percentages. Comparison of outcomes used an independent t-test with $p \leq 0.05$ as significant. Control for confounders like age and gender was done through stratification, followed by post-stratification analysis using the t-test with $p \leq 0.05$ significance level.

Results

A total of 60 patients participated in the study, divided into Group A (bupivacaine) and Group B (bupivacaine with steroids). Group A had 30 patients with a male-female ratio of 18:12 and a mean age of 43.27±7.18 years. Group B had 30 patients with a male-female ratio of 17:13 and a mean age of 43.50±6.80 years. Age distribution: Group-A: 8(26.7%) patients aged 18-40, 22(73.3%) aged 41-70. Group-B: 7(23.3%) patients aged 18-40, 23(76.7%) aged 41-70. Group-A: 22(73.3%) rural, 8(26.7%) urban. Group-B: 21(70.0%) rural, 9(30.0%) urban residents.

In group A, 23.3% had low income, 70.0% had middle income, and 6.7% had high income. In group B, 20.0% had low income, 73.3% had middle income, and 6.7% had high income. In group A, 10.0% were illiterate, 70.0% had education up to matric, and 20.0% had education up to inter or above. In group B, 16.7% were illiterate, 66.7% had education up to matric, and 16.7% had education up to inter or above (Table 1).

In group A (PNB with bupivacaine), the mean pain score at 12 hours after surgery was 2.47±0.681, while 1.90±0.481 in group B (PNB with bupivacaine plus steroid), which is statistically significant with a p-value of 0.001. In group A, the mean pain score 24 hours after surgery was 1.40±0.563, while 0.43±0.626 in group B, which is statistically significant with a p-value of 0.001 (Table-2). Stratification of pain score at 12 hours after surgery concerning gender, age, residence, socio-economic status and educational status was presented in tables 3 to 7, and there was a significant difference between groups in each stratum ($p<0.05$).

Table 1: Comparison of the frequency distribution of different variables between groups

Variables	Groups		Total
	PNB with Bupivacaine	PNB with Bupivacaine plus Steroid	
Gender – Male	18 (60.0%)	17 (56.7%)	35 (58.3%)
Gender – Female	12 (40.0%)	13 (43.3%)	25 (41.7%)
Total	30 (100.0%)	30 (100.0%)	60 (100.0%)
Age (18-40 years)	8 (26.7%)	7 (23.3%)	15 (25.0%)
Age (41-70 years)	22 (73.3%)	23 (76.7%)	45 (75.0%)
Total	30 (100.0%)	30 (100.0%)	60 (100.0%)
Residence – Rural	22 (73.3%)	21 (70.0%)	43 (71.7%)
Residence - Urban	8 (26.7%)	9 (30.0%)	17 (28.3%)
Total	30 (100.0%)	30 (100.0%)	60 (100.0%)
SES – Low	7 (23.3%)	6 (20.0%)	13 (21.7%)
SES – Middle	21 (70.0%)	22 (73.3%)	43 (71.7%)
SES – High	2 (6.7%)	2 (6.7%)	4 (6.7%)
Total	30 (100.0%)	30 (100.0%)	60 (100.0%)
Education – Illiterate	3 (10.0%)	5 (16.7%)	8 (13.3%)
Education - Up to Matric	21 (70.0%)	20 (66.7%)	41 (68.3%)
Education - Inter or Above	6 (20.0%)	5 (16.7%)	11 (18.3%)
Total	30 (100.0%)	30 (100.0%)	60 (100.0%)

Table 2: Comparison of mean pain score at 12 and 24 hours after surgery between groups

Time Interval	Groups	Mean ± SD	p-value
Pain Score at 12 Hours	PNB with Bupivacaine	2.47 ± 0.681	0.001
	PNB with Bupivacaine plus Steroid	1.90 ± 0.481	
Pain Score at 24 Hours	PNB with Bupivacaine	1.40 ± 0.563	0.001
	PNB with Bupivacaine plus Steroid	0.43 ± 0.626	

Table 3: Stratification of pain score 12 hours after surgery between groups concerning gender

	Gender	Groups	Mean	S.D.	p-value
Pain score at 12 hours after surgery	Male	PNB with bupivacaine	2.56	0.705	0.001
		PNB with bupivacaine plus steroid	1.82	0.393	
	Female	PNB with bupivacaine	2.33	0.651	0.001
		PNB with bupivacaine plus steroid	1.77	0.577	

Table 4: Stratification of pain score 12 hours after surgery between groups concerning age

	Age groups	Groups	Mean	S.D.	p-value
Pain score at 12 hours after surgery	18-40 years	PNB with bupivacaine	2.50	0.756	0.001
		PNB with bupivacaine plus steroid	1.76	0.378	
	41-70 years	PNB with bupivacaine	2.45	0.671	0.001

		PNB with bupivacaine plus steroid	1.91	0.515	

Table 5: Stratification of pain score 12 hours after surgery between groups concerning residence

Pain score at 12 hours after surgery	Residence	Groups	Mean	S.D.	p-value
	Rural	PNB with bupivacaine	2.45	0.671	0.002
		PNB with bupivacaine plus steroid	1.86	0.478	
	Urban	PNB with bupivacaine	2.50	0.756	0.001
		PNB with bupivacaine plus steroid	1.85	0.500	

Table 6: Stratification of pain score 12 hours after surgery between groups concerning socio-economic status

Pain score at 12 hours after surgery	SES	Groups	Mean	S.D.	p-value
	Low	PNB with bupivacaine	2.43	0.787	0.001
		PNB with bupivacaine plus steroid	1.97	0.408	
	Middle	PNB with bupivacaine	2.48	0.680	0.001
		PNB with bupivacaine plus steroid	1.77	0.429	
	High	PNB with bupivacaine	2.50	0.707	0.001
		PNB with bupivacaine plus steroid	1.35	0.535	

Table 7: Stratification of pain score 12 hours after surgery between groups concerning educational status

Pain score at 12 hours after surgery	Educational status	Groups	Mean	S.D.	p-value
	Illiterate	PNB with bupivacaine	2.33	0.577	0.001
		PNB with bupivacaine plus steroid	1.86	0.365	
	Upto matric	PNB with bupivacaine	2.57	0.746	0.001
		PNB with bupivacaine plus steroid	1.80	0.523	
	Inter or above	PNB with bupivacaine	2.17	0.408	0.001
		PNB with bupivacaine plus steroid	1.73	0.447	

Discussion

Proper management of post-hemorrhoidectomy perianal pain is crucial to prevent extended recovery times and patient dissatisfaction. A pudendal nerve block (PNB) provides targeted pain relief by blocking pain signals before reaching the nervous system. Bupivacaine, a long-acting local anaesthetic, achieves this by inhibiting nociceptive transmission via sodium channel blockade along the pudendal nerve pathways, making it the preferred choice for postoperative pain control.

The focused use of targeted analgesics improves patient comfort and speeds up recovery. Bupivacaine in PNB protocols is now a standard for perianal pain management, emphasising the importance of optimising postoperative pain control. Corticosteroids like dexamethasone prolong analgesic effects by reducing inflammation around nerve injuries or surgery sites, complementing bupivacaine's pain-relieving properties.

Combining corticosteroids and local anaesthetics shows promise in improving pain relief after surgery and reducing inflammation and swelling side effects, offering hope in clinical pain management (5-6).

Significant pain control differences were observed between groups. Group A had a mean pain score of 2.47 ± 0.681 at 12 hours post-surgery with bupivacaine alone, while group B, receiving bupivacaine and a corticosteroid, had a significantly lower score of 1.90 ± 0.481 ($p=0.001$). These results support adding corticosteroids to bupivacaine for enhanced analgesia, prolonging pain relief and reducing patient intensity.

The statistical analysis shows significant outcomes, emphasising the clinical importance of using this pharmacological combination to improve postoperative recovery quality for patients. These findings contribute to existing literature and suggest further research for optimising pain management in clinical settings and enhancing patient care post-surgery (7).

The pain scores in group B decreased significantly due to the combined pharmacological agents used. Bupivacaine provides immediate pain relief by blocking nociceptive input, while the corticosteroid component reduces inflammation at the surgical site, which is a significant factor in post-hemorrhoidectomy pain. Similar studies support these findings; for example, Khan et al.'s research showed that adding dexamethasone to local anaesthetics in Pudendal Nerve Block reduced pain scores and decreased the need for rescue analgesics for 24 hours postoperatively.

The importance of using multiple pain treatments instead of relying only on opioids is evident. This approach can improve patient comfort, reduce opioid-related risks, and boost post-surgery recovery. Embracing combination therapies may lead to shorter hospital stays and increased patient satisfaction. These results support the use of combined treatments for post-surgical pain, especially in procedures like hemorrhoidectomy that involve high discomfort levels (8).

The implications of these findings are significant. The reduced pain scores in group B likely translate to better early postoperative mobility, reduced reliance on systemic analgesics, and potentially shorter hospital stays. Furthermore, the opioid-sparing effect of this combination reduces the risk of opioid-related side effects, such as nausea, constipation, and sedation, which are particularly undesirable in postoperative care (9).

However, the addition of corticosteroids to PNB is not without potential limitations. While rare, adverse effects such as localised tissue atrophy or systemic corticosteroid-related complications (e.g., hyperglycemia in diabetic patients) must be considered. This study reported no adverse effects, suggesting that the dose and technique used were safe and effective. The use of ultrasound guidance likely contributed to the precision of the block, minimising the risk of complications.

Conclusion

Combining PNB with bupivacaine and steroid for haemorrhoidectomy has shown benefits in managing post-operative pain scores, suggesting that this approach can be a safe and effective technique for perineal pain after haemorrhoid surgery.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned. (IRBEC-MMS-033-24)
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The authors declared the absence of a conflict of interest.

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References

1. Ali M, Hashmi ZA, Zafar A. Haemorrhoidectomy using pudendal nerve block and local infiltration. Gomal J Med Sci. 2020; 8(2):150-5.
2. Rajabi M, Hosseinpour M, Jalalvand F, Afshar M, Moosavi G, Behdad S. Ischiorectal block with bupivacaine for post hemorrhoidectomy pain. The Korean J Pain. 2022; 25(2):89-93.
3. Paganelli MA, Popescu GK. Actions of bupivacaine, a widely used local anaesthetic, on NMDA receptor responses. J Neurosci. 2020; 35(2):831-42.
4. Li J, Liu H, Qin K, Liu M, Yang H, Li Y. Efficacy and safety of pudendal nerve block for postoperative analgesia of haemorrhoids: a systematic review of 7 randomised controlled trials. Ann Palliative Med. 2021; 10(2):2283292-2292.
5. Sarmento FJ, Catanzaro M, Gomes JB. Pudendal nerve block in anorectal surgery: a systematic review. Colorectal Dis. 2020; 22(10):1335–45.
6. Elsharkawy H, Pino C. Regional anaesthesia in colorectal surgery: current perspectives. Local RegAnesth. 2020; 13:11–22.
7. Khan ZH, Aghamohammadi D, Mirakhorli M, Heshmatipour M, Ramezani H. The effect of pudendal nerve block on post-haemorrhoidectomy pain: a double-masked randomised controlled trial. Colorectal Dis. 2023; 15(2):203–7.
8. Zhang H, Zhu H, Cai Y, et al. Dexamethasone as an adjuvant to local anaesthetics in Pudendal Nerve Block: a meta-analysis of randomised controlled trials. Medicine (Baltimore). 2018; 97(11):e11531.
9. Furtado LP, Marquezi ML, Zangrando CR, et al. Efficacy of pudendal nerve block in haemorrhoidectomy: a meta-analysis. World J Gastrointest Surg. 2021; 13(9):1009–16.