Revista da Sociedade Portuguesa de Anestesiologia
http://revistas.rcaap.pt/anestesiologia
https://dx.doi.org/10.25751/rspa.41691

ARTIGO ORIGINAL / ORIGINAL ARTICLE

Comparison of Efficacy and Efficiency of Trans-Nasal Spheno-Palatine Ganglion Block for the Management of Post-Dural Puncture Headache

Comparação da Eficácia e Eficiência do Bloqueio Transnasal do Gânglio Esfenopalatino no Tratamento da Cefaleia Pós-Punção Dural

Sanjeev Singh [1,2,*], Rachna Mishra [3], Ehab Mahrous Deigheidy [4,5]

Afiliações

[1] Department of Anaesthesiology and Intensive Care, CHS, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana
[2] Departments of Anaesthesiology and Intensive Care, SAMSRI, Lucknow, India
[3] Obstetrics and Gynecology, SAMSRI, Lucknow, India
[4] Surgery, SAMSRI, Lucknow, India
[5] Center of Surgery, Marie Lannelongue, University Paris-South, Le Plessis-Robinson, France

Keywords
Anesthetics, Local; Blood Patch, Epidural; Ganglionic Blockers; Post-Dural Puncture Headache.

Palavras-chave
Anestésicos Locais; Blood Patch Epidural; Bloqueadores Ganglionares; Cefaleia Pós-Punção Dural.

ABSTRACT

Introduction: Epidural blood patch (EBP) is the standard treatment for refractory post-dural puncture headache (PDPH) following caesarean section (C/s), but is invasive and associated with rare yet serious complications. A minimally invasive alternative is the trans-nasal sphenopalatine ganglion block (TNSPGB). This study compared the efficacy and efficiency of TNSPGB in achieving pain reduction, defined as a decrease of ≥2 points on the Numeric Rating Scale (NRS).

Methods: This single-centre, prospective interventional study was conducted after ethical approval. Forty-four patients with PDPH were allocated equally into two groups. Group I received EBP, and Group II received TNSPGB with 1.4 mL local anaesthetic (0.7 mL lidocaine 4% plus 0.7 mL ropivacaine 0.5%). Hemodynamic variables, pain scores, onset and duration of analgesia, adverse effects, total paracetamol dose, patient satisfaction, and hospital stay within 24 h were recorded.

Results: Baseline pain scores were comparable between groups (p=0.457). The onset of analgesia was significantly faster in Group II than Group I (18.2±4.4 *vs* 62.3±11.8 min, p<0.001) and they reported lower NRS during 1 hour. After that, Group I reported significantly lower NRS at 2 and 4 hours (p< 0.001). At 8, 12 and 24 hours, pain scores were similarly low (NRS-1 to 3) in both groups (all p>0.05). There were no significant differences between the groups regarding hemodynamic, pain scores, duration of analgesia, adverse effects, rescue analgesia, and patient satisfaction within 24 hours after the intervention.

Conclusion: TNSPGB with local anaesthetics provides effective, rapid, safe, and minimally invasive pain relief for PDPH following C/s and is comparable to EBP.

Autor Correspondente/Corresponding Author*:
Sanjeev Singh
Morada: Department of Anaesthesiology and Intensive Care, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.
E-mail: drsanjeev73@rediffmail.com

RESUMO

Introdução: O *blood patch* epidural (BPE) é o tratamento padrão para a cefaleia pós-punção da dura (CPPD) refratária após cesariana, mas é invasivo e está associado a complicações potencialmente graves. Uma alternativa menos invasiva é o bloqueio transnasal do gânglio esfenopalatino (BTGEP). Este estudo comparou a eficácia e eficiência do BTGEP na redução da dor, definida como uma diminuição de ≥2 pontos na Escala Numérica de Dor (END).

Métodos: Este estudo intervencional prospetivo, realizado num único centro, foi conduzido após aprovação ética. Quarenta e quatro pacientes com CPPD foram distribuídos igualmente em dois grupos. O Grupo I recebeu BPE, e o Grupo II recebeu BTGEP com 1,4 mL de anestésico local (0,7 mL de lidocaína a 4% mais 0,7 mL de ropivacaína a 0,5%). Foram registadas variáveis hemodinâmicas, pontuações da dor, início e duração da analgesia, efeitos adversos, dose total de paracetamol, satisfação dos pacientes e tempo de internamento até 24 horas.

Resultados: As pontuações iniciais da dor foram comparáveis entre os grupos (p=0,457). O início da analgesia foi significativamente mais rápido no Grupo II do que no Grupo I (18,2±4,4 *vs* 62,3±11,8 min, p<0,001) e apresentou valores mais baixos da END durante 1 hora. Após esse período, o Grupo I reportou valores significativamente mais baixos da END às 2 e 4 horas (p<0,001). Às 8, 12 e 24 horas, as pontuações da dor foram igualmente baixas (END 1 a 3) em ambos os grupos (todos p>0,05). Não houve diferenças significativas entre os grupos em relação às variáveis hemodinâmicas, pontuações da dor, duração da analgesia, efeitos adversos, analgesia de resgate e satisfação dos pacientes até 24 horas após a intervenção.

Conclusão: O BTGEP com anestésicos locais proporciona um alívio da dor eficaz, rápido, seguro e minimamente invasivo para a CPPD após cesariana, sendo comparável ao BPE.

INTRODUCTION

Post-dural puncture headache (PDPH) is a complication

that may occur following perforation of the dura mater during spinal or epidural anaesthesia. It can significantly affect patients' postoperative recovery and quality of life. Among the complications of neuraxial anaesthesia (NA), is the most common impacts overall patient well-being.[1] The incidence of PDPH in the obstetric population is remarkably higher; it can reach up to 86% in the obstetric population compared to 25% in the non-obstetric population.[2]

According to the International Classification of Headache Disorders, 3rd edition (ICHD-3, 2018) by the Headache Classification Committee of the International Headache Society (IHS), PDPH is defined as a bilateral headache that develops within 5 days of a dural puncture and disappears within 14 days. It worsens within 15 minutes of assuming an upright position and improves within 30 minutes of lying down.[3] Common symptoms accompanying PDPH include headache, neck stiffness, tinnitus, hyperacusis, nausea, or photophobia.[4,5] Typically, it resolves within a week without leaving permanent motor or sensory deficits or sphincter disturbances. Patient-related factors that increase the risk of PDPH include younger age and female sex. Procedural factors that help reduce the risk include the use of non-cutting (atraumatic) needles, smaller-gauge needles, and minimizing the number of attempts.[6]

Pharmacologic management often includes non-steroidal anti-inflammatory drugs (NSAIDs) and caffeine.[4,7] However, these methods are often ineffective, requiring more invasive interventions such as an epidural blood patch (EBP) or intrathecal catheter placement. EBP remains the gold standard for PDPH management, with reported success rates ranging from 67% to 95%, though failure occurs in up to 28% of cases.[8] Moreover, EBP is not without risk; rare but serious complications include spinal subdural hematoma, cauda equina syndrome, epidural infection, and meningitis.[9,10]

Recent observational case studies suggest that the minimally invasive trans-nasal sphenopalatine ganglion (TNSPG) block may offer comparable efficacy to EBP in the treatment of non-obstetric PDPH and refractory headaches.[2,11] However, evidence regarding its effectiveness in PDPH following caesarean section (C/s) remains limited. The sphenopalatine ganglion is a parasympathetic ganglion composed of sympathetic, parasympathetic, and somatosensory nerve fibres, located bilaterally near the sphenopalatine foramen, posterior to the middle nasal concha (**Fig. 1**). Its size is about 5 mm, which has 1-2 mm of connective tissue covered by a mucosal membrane[11] and is thus available for topical administration of local anaesthetic via a trans-nasal approach. The TNSPG block is thought to attenuate parasympathetic cerebral vasodilation, thereby providing rapid symptom relief.

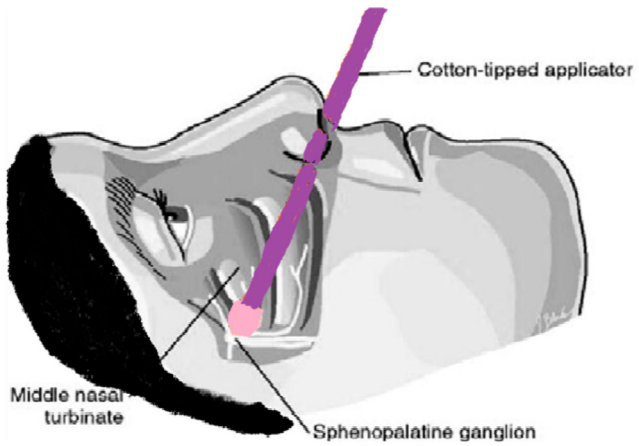

Figure 1. The sphenopalatine ganglion is located bilaterally close to the sphenopalatine foramen posterior to the middle nasal concha.

In 2020, Hung and colleagues in a pilot meta-analysis reported no significant difference in pain relief between patients with PDPH who received sphenopalatine ganglion block treatment and those who did not.[12] However, a few studies have reported the TNSPG block to be effective in managing PDPH. Owing to these conflicting findings, we aimed to compare the efficacy of the two interventional methods in treating PDPH following C/s.

METHODS

This was a single-centre, prospective, observational clinical study using consecutive sampling conducted between August 2023 and July 2024, after ethical approval for this study was obtained from the Ethical Clearance Committee on Human Research. Informed consent was signed by all participants after explaining the study in their local language. All methods were performed per the regulations of the Declaration of Helsinki as revised in 2024. Patients were informed about the use of the Numeric Rating Scale (NRS) to assess pain severity, ranging from 0 (no pain) to 10 (most severe pain). An investigator performed consecutive sampling and allocated participants into two study groups using a computer-generated random number sequence, which was sealed in opaque envelopes. Another investigator prepared the assigned intervention according to the envelope, either the TNSPG blocking drugs or the collection of autologous blood for an epidural patch, before the intervention. Participants in Group I received an autologous epidural blood patch, while those in Group II received a TNSPG block with 1.4 mL of local anaesthetic (0.7 mL of 4% lidocaine and 0.7 mL of 0.5% ropivacaine) administered for 10 minutes.

Sample size: It was calculated using the Power Analysis & Sample Size (PASS) program version 11.

Based on a study by Mowafi *et al* (2022),[2] which reported a NRS score of 1.7 ± 2.3 in the intervention group and 4.1 ± 1.4 in the control group at 2 hours, a total of 15 patients per group would be required to detect a similar difference with 90% power and a 5% significance level in a superiority design. We considered a 40% dropout rate and variability in standard deviation; we included 22 patients in each group.

Inclusion criteria: Age between 18 and 45 years who had spinal anaesthesia with a Whitacre 25G spinal needle, ASA status I or II, BMI < 35 kg/m^2, and with active PDPH within one week after subarachnoid block in supine position (NRS ≥ 4 for pain) not relieved with fluids, caffeine, and paracetamol, thus fulfilling our local criteria for TNSPG block or EBP. The

pain with an NRS score ≥4 intensity threshold was chosen, as it is the most common threshold for moderate pain.[14]

Exclusion criteria: We excluded patients who refused to take part in the study, patients with ASA status > II, patients with chronic headaches or migraines, patients with nasal septal deviation, and patients with a history of nasal polyps, bleeding, or coagulopathy. If they were unable to cooperate with study procedures, had a history of allergy to ropivacaine or lidocaine, or had received opioids less than 12 hours before study inclusion.

Intervention: The patients were offered a rescue TNSPG block or epidural blood patch if they experienced persistent pain in the upright position, defined as NRS score ≥4, and pain did not respond to the standard treatment within one week after the subdural puncture.

Epidural blood patch (EBP): After obtaining informed consent, the procedure was carried out in the operating room by two experienced anaesthesiologists. The patient was placed in the sitting position under sterile conditions, and autologous blood was collected by placing a tourniquet on the left antebrachial region and drawing 20 mL of blood from the left brachial vein. The blood-filled syringe was handed to the second anesthesiologist. Under sterile conditions, an 18-gauge Touhy needle (BD Perisafe™ Modified Tuohy Point Epidural Needles, India) was inserted into the same spinal segment where the puncture had occurred and 15–20 mL of autologous blood was slowly injected into the epidural space. Following the procedure, patients were instructed to remain supine for at least 45 minutes. Headache symptoms generally resolved as NRS ≥ 4, decreasing ≥ 2 points. Patients were then transferred to the ward and monitored for at least 24 hours. If pain persisted, paracetamol 15 mg/kg was administered IV, and the total dosage was recorded. Trans-nasal sphenopalatine ganglion (TNSPG) block: The procedure was performed in patients with PDPH who declined the EBP and had a NRS ≥ 4 for pain. After informed consent was obtained, the procedure was carried out in the operating room with the patient in the supine position, breathing comfortably through both nostrils to ensure patency. In group II, participants received a TNSPG block with 1.4 mL of local anaesthetic (0.7 mL lidocaine 4% and 0.7 mL ropivacaine 0.5%) soaked swabs for 10 minutes in both nostrils until reaching the posterior pharynx. After the procedure, patients were transferred to the ward. If pain persisted, intravenous paracetamol 15 mg/kg was administered, and the total dosage was recorded. A TNSPG block was considered inadequate if the NRS score≥ 4.

Patients' blood pressure, heart rate, and oxygen saturation (SpO_2) were measured using a standard non-invasive multiparameter patient monitor (Philips multi-parameter monitors "Philips Goldway G30E") with an automated oscillometric blood pressure cuff and integrated pulse rate measurement. The same device was consistently used for all patients to ensure accuracy and uniformity of data collection. The pain score was taken before the procedure (baseline) and at 10, 30 minutes, 1, 2, 4, 8, 12, and 24 hours following the treatment.

Study Endpoint: The study endpoint was defined as the failure to control PDPH with the indicated care. It includes persistent PDPH pain intensity of NRS ≥ 4 in an upright position, an NRS reduction of ≥ 2 points but still ≥ 4 at 24 hours post-procedure, or the need for rescue analgesia within 24 hours due to inadequate pain relief or patient discomfort.

Study Outcomes: The primary outcome was to assess the efficacy of the TNSPG block in treating PDPH, defined by a reduction in NRS ≥ 4 in an upright position. Secondary outcomes included the onset of analgesia (time to first report of a NRS reduction of ≥ 2 points), duration of analgesia (time from onset to recurrence of pain ≥ 4), total paracetamol consumption in 24 hours, patient satisfaction measured on a 3-point Likert scale (satisfied-3, borderline-2, and unsatisfied-1), patients requiring hospital admission after intervention for an EBP, and adverse effects. Any adverse effects were continuously monitored during the observation period.

Statistical Methods: Data were analysed using IBM SPSS version 23. The Shapiro–Wilk test was applied to assess normality. Categorical variables were compared between groups using the chi-square test. For continuous variables, the independent two-sample t-test was used when data were normally distributed, and the Mann–Whitney U test was applied when data were non-normally distributed. The generalized linear model was used to examine the main effects of group and time, as well as their interaction, on NRS scores. Multiple comparisons were performed with the Bonferroni test. Quantitative data were presented as mean ± SD, while categorical data were expressed as frequency (percentage). Non-normally distributed data were reported as median (minimum-maximum). A p-value < 0.05 was considered statistically significant.

RESULTS

In this study, eighty-six (86) patients were assessed for eligibility. Forty-three were excluded (27 did not meet the inclusion criteria, and 15 declined to participate). Forty-four patients were allocated to receive an epidural blood patch (EBP) in group I (n = 22) and the trans-nasal spheno-palatine ganglion (TNSPG) block with local anaesthetics in group II (n = 22) (**Fig. 2**). All patients completed the study as per protocol.

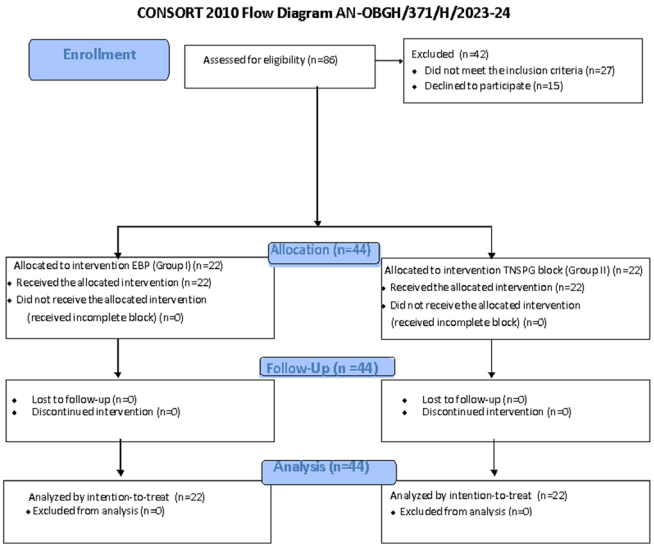

Figure 2. The trial flow diagram.

There were no statistically significant differences between the groups in demographic characteristics, including age, gestational age, weight, height, and body mass index (**Table 1**).

Table 1. Comparison regarding demographic characteristics.

Variables	Group I mean ± SD	Group I (Min-Max)	Group II mean ± SD	Group II (Min-Max)	*P*-value ‡
Age (year)	28.35 ± 1.4	(22 - 34)	27.52 ± 3.9	(20 - 38)	0.516
Gestational age (weeks)	38.73 ± 1.84	(37 - 41)	39.16 ± 1.72	(37 - 40)	0.273
Weight (kg)	73.9 ± 11.0	(55.0 - 93.0)	73.7 ± 10.5	(55.0 - 91.0)	0.742
Height (cm)	166.3 ± 9.1	(154.0 - 182.0)	165.8 ± 7.9	(155.0 - 182.0)	0.631
BMI (kg/m^2)	27.94 ± 4.93	(22.8 - 29.2)	27.31±4.68	(22.3 - 29.8)	0.594

Data are expressed as mean ± standard deviation (SD). Min–Max: minimum–maximum; BMI: body mass index; ‡ Independent t-test.

The hemodynamic parameters, including mean arterial pressure (MAP) and systolic blood pressure in **Table 2** and heart rate (HR) in **Table 3**, did not differ significantly between the two groups, as shown in **Fig. 3**.

Table 2. Comparison of mean arterial pressure (MAP) in mmHg.

Time	Group I	Group II	*P*-value ‡	Effect of Group I relative to Group II	
				Mean difference ± SD	95% CI
Baseline	97.5 ± 5.5	96.1 ± 5.3	0.694	1.4 ± 1.7	– 2.3 to 4.7
Minute-10	91.3 ± 4.9	94.4 ± 5.0	0.059	– 3.1 ± 1.5	– 6.4 to 0.1
Minute-30	90.2 ± 5.6	93.4± 5.3	0.077	– 3.2 ± 1.9	– 6.6 to 0.3
Hour-1	88.2 ± 5.7	91.3 ± 5.8	0.058	– 3.1 ± 1.7	– 6.7 to 0.6
Hour-2	87.5 ± 5.8	90.8 ± 5.4	0.085	– 3.5 ± 1.9	– 6.8 to 0.5
Hour-4	86.8 ± 5.4	89.4 ± 5.6	0.153	– 2.6 ± 1.7	– 5.7 to 0.9
Hour-8	84.8 ± 5.5	87.3 ± 3.3	0.138	– 2.3 ± 1.5	– 5.2 to 0.7
Hour-12	82.7 ± 5.3	85.6 ± 4.1	0.195	– 2.9 ± 1.8	– 5.3 to 1.2
Hour-24	81.1 ± 6.1	82.4 ± 3.7	0.274	– 1.3 ± 1.6	– 4.5 to 1.6

Data are expressed as mean ± standard deviation (SD); CI: confidence interval; ‡ Independent t-test.

Table 3. Comparison of heart rate (HR) in beats per minute.

Time	Group I	Group II	*P*-value ‡	Effect of Group I relative to Group II	
				Mean difference ± SD	95% CI
Baseline	91.5 ± 5.8	91.2 ± 5.4	0.863	0.3 ± 1.6	–2.8 to 3.4
Minute-10	88.6 ± 5.3	91.1 ± 5.7	0.092	– 2.5 ± 1.5	–5.4 to 0.4
Minute-30	87.5 ± 5.8	90.1 ± 5.4	0.085	– 2.6 ± 1.9	–6.3 to 1.1
Hour-1	84.6 ± 4.4	86.7 ± 4.2	0.131	– 2.1 ± 1.7	–5.4 to 1.2
Hour-2	82.2 ± 4.6	82.9 ± 4.9	0.357	– 0.7 ± 1.2	–3.0 to 1.6
Hour-4	81.8 ± 5.7	84.1 ± 5.1	0.179	– 2.3 ± 1.8	–5.8 to 1.2
Hour-8	78.1 ± 5.3	78.7 ± 5.5	0.452	– 0.6 ± 1.7	–3.9 to 2.7
Hour-12	77.9 ± 5.5	78.2 ± 5.8	0.527	– 0.3 ± 1.2	–2.6 to 2.0
Hour-24	77.9 ± 5.1	76.4 ± 5.2	0.184	– 1.5 ± 1.6	–4.6 to 1.6

Data are expressed as mean ± standard deviation (SD); CI: confidence interval; ‡ Independent t-test.

Pain scores are summarized as median (interquartile range) in **Table 4**. At baseline, there was no significant difference between groups (p=0.457), indicating comparable initial pain perception. At 10 minutes, 30 minutes, and 1 hour, Group II demonstrated significantly lower pain scores than Group I (all p< 0.001). At 2 and 4 hours, Group I reported significantly lower pain scores than Group II (both p< 0.001), indicating that the analgesic effect in Group I was more sustained. Beyond 8, 12, and 24 hours, no significant differences were observed between the groups (all p> 0.05), as shown in **Fig. 4**. The onset of analgesia was significantly slower in Group I compared to Group II (62.3 ± 11.8 *vs* 18.2 ± 4.4 minutes, p<0.001). Although the mean duration of analgesia was longer in Group I (582.6 ± 73.8 minutes) than in Group II (543.1 ± 58.3 minutes), the difference did not reach statistical significance (p=0.055). Rescue analgesia was required in 31.8% of patients in Group I and 36.3% in Group II. Both the mean

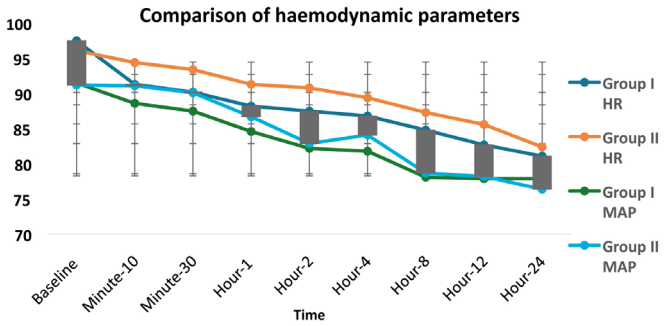

Figure 3. Comparison of haemodynamic parameters.

HR: heart rate; MAP: mean arterial pressure.

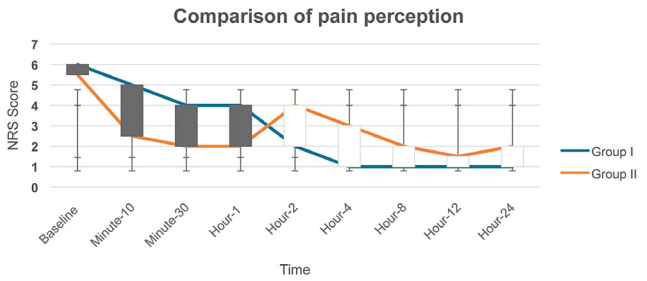

Figure 4. Comparison of pain perception.

Table 4. Comparison regarding pain perception.

Time	Group I	Group II	*P*-value ^
Baseline	6.0 (4.0–7.0)	5.5 (4.0–7.0)	0.457
Minute-10	5.0 (4.1–5.0)	2.5 (1.5–3.7)	**< 0.001**
Minute-30	4.0 (4.2–5.0)	2.0 (1.0–2.0)	**< 0.001**
Hour-1	4.0 (2.0–4.0)	2.0 (1.0–2.0)	**< 0.001**
Hour-2	2.0 (1.0–2.0)	4.0 (3.0–4.0)	**< 0.001**
Hour-4	1.0 (1.0–2.0)	3.0 (2.0–3.0)	**< 0.001**
Hour-8	1.0 (1.0–2.0)	2.0 (1.0–2.0)	0.124
Hour-12	1.0 (1.0–2.0)	1.5 (1.0–2.0)	0.565
Hour-24	1.0 (1.0–3.0)	2.0 (1.0–3.0)	0.832

Data expresses as median and interquartile range; ^Mann Whitney test.

Table 5. Comparison regarding the onset, duration of analgesia, and total dose of rescue analgesic.

Time	Group I	Group II	*P*-value ^	Effect of group I relative to II	
				Mean ± SE	95% CI
Onset (minutes)	62.3 ± 11.8	18.2 ± 4.4	< 0.001	44.1 ± 2.7	38.68 to 49.5
Duration (minutes)	582.6 ± 73.8	543.1 ± 58.3	0.055	39.5 ± 20.1	–0.96 to 79.9
Patients receiving rescue, n (%)	7 (31.8%)	8 (36.3%)	-	-	-
Mean absolute rescue dose per patient across the whole group (mg)	352.7 ± 519.7	402.0 ± 535.6	0.760	–49.3 ± 159.1	–370.4 to 271.8
Absolute rescue dose among recipients	1108.5 ± 104.94	1105.5 ± 105.37	0.957	+3.0 ± 54.4	–106.8 to 112.8

Data expresses as percent, CI confidence interval. ^ Independent t-test.

rescue dose per patient and the absolute dose among recipients were comparable between the groups, with no statistically significant differences observed.

As shown in **Table 6**, bitter taste was reported in 22.7% of patients in Group II but in none of Group I (p= 0.048). Nasal congestion occurred in 13.6% and lacrimation in 4.5% of Group II, though these differences were not statistically significant. No patients in either group experienced dizziness,

Table 6. Comparison regarding adverse effects, hospital stay, and patients' satisfaction.

Time	Group I	Group II	*P*-value ^
Bitter taste	0 (0.0%)	5 (22.7%)	ß **0.048**
Lacrimation	0 (0.0%)	1 (4.5%)	ß 1.000
Nasal congestion	0 (0.0%)	3 (13.6%)	ß 0.233
Dizziness	0 (0.0%)	0 (0.0%)	N/A
Epistaxis / Haematoma	0 (0.0%)	0 (0.0%)	N/A
EBP after first intervention	0 (0.0%)	2 (9.1%)	ß 0.448
Satisfaction			
Satisfied	7 (31.8%)	6 (27.3%)	¥ 1.000
Borderline	9 (40.9%)	9 (40.9%)	
Unsatisfied	6 (27.3%)	7 (31.8%)	

Data expresses as n, percent (%). N/A- not applicable; ß Fisher's exact test; ¥ linear by linear association; RR-relative rate; CI-confidence interval.

epistaxis, or hematoma. Hospital stay after intervention for rescue EBP was required in 9.1% of patients in Group II and none in Group I, but this difference was not significant (p= 0.448). Patient satisfaction was comparable between groups: 31.8% in Group I and 27.3% in Group II reported being satisfied (RR = 1.17, 95% CI: 0.47–2.92). Borderline satisfaction was observed equally in both groups (40.9%), while dissatisfaction was reported by 27.3% in Group I and 31.8% in Group II.

DISCUSSION

This study compared the effectiveness and safety of trans-nasal sphenopalatine ganglion (TNSPG) block in group II and epidural blood patch (EBP) in group I, for the management of post-dural puncture headache (PDPH). The onset of analgesia was significantly faster with TNSPG block (18.2 ± 4.4 min) compared to EBP (62.3± 11.8 min, p<0.001). Pain NRS score declined rapidly within the first post-intervention hour in the TNSPG group, whereas patients in the EBP group experienced a greater reduction between 2–4 hours. After 8-24 hours, pain perception stabilized at low levels in both groups. Intravenous paracetamol for pain control and rescue analgesic requirements in both groups were comparable, without significant differences. Adverse effects were generally mild. Bitter taste and nasal congestion occurred more frequently in the TNSPG group, while no major complications were observed in either group. Hemodynamic variables, including mean arterial pressure (MAP) and heart rate (HR), showed no statistically significant differences between the groups. Although EBP remains the standard treatment for PDPH, it is invasive and carries potential risks, including infection, fever, dural reinjury, and radiculopathy due to injection of large blood volumes.[15] By contrast, the TNSPG block is simple, minimally invasive, and well tolerated. Satisfaction levels and hospital stay were comparable, reinforcing the safety of both interventions. Overall, the TNSPG block demonstrated a favourable balance of efficacy and tolerability, supporting its role as a valuable alternative to EBP and systemic analgesics.

The TNSPG block is not a new technique, having first been described by Dr. Greenfield Sluder in 1908, but it has recently gained renewed attention in anaesthesia practice.[16] It has been employed for conditions such as facial pain, somatic syndromes, neck pain, and headaches, and more recently for complex regional pain syndrome (CRPS) and PDPH. Evidence supporting its role in PDPH, however, remains limited and is largely based on case reports.

Cohen *et al* (2001) first reported trans-nasal SPG block using cotton-tipped applicators soaked in eutectic mixture of local anaesthetics (EMLA) cream, showing effectiveness without major side effects.[17] Subsequent reports have questioned whether the benefit is pharmacological or due to ganglion stimulation, which may improve cerebral vascular tone and blood flow.[18,19]

Several case reports have documented the use of the SPG block for PDPH. Kent and Mehaffey described its use in three obstetric patients in the emergency department (ED).[20] They applied cotton applicators soaked in 2% lidocaine to the posterior nasopharynx, replacing them after 10 minutes for an additional 20 minutes. All three patients experienced immediate pain relief; however, two of the three later experienced a recurrence of headache and required an EBP. This suggests that while the block may offer short-term relief, its long-term efficacy is limited. These findings highlight the potential benefit of exploring alternative local anesthetic combinations or adjuncts to improve outcomes, particularly the use of a combination of short-acting, fast-onset lidocaine with long-acting, slow-onset ropivacaine.

Cohen *et al* retrospectively compared the TNSPG block and EBP in obstetric patients with PDPH following dural puncture.[21] They found greater pain relief with the TNSPG block at 30 and 60 minutes (71% *vs* 31%). Our findings are consistent with their observations of early and fast pain relief through TNSPG block, though methodological differences exist in study design, repetition of the block, the type and concentration of local anaesthetics likely contributed to the variation in results. In Cohen's study, patients could receive repeated blocks every 15 minutes with 2% lidocaine, potentially leading to bias, whereas in our study, a single block was performed using a 4% lidocaine and 0.5% ropivacaine combination. Notably, fewer patients in our cohort required rescue EBP (9.1%) compared with Cohen's (31%), possibly reflecting differences in drug regimen and study design.

Our TNSP block drug combination of 4% lidocaine with 0.5% ropivacaine yielded a rapid onset, longer duration, and reduced pain intensity, leading to high patient satisfaction. The procedure is straightforward, minimally invasive, and easily reproducible. Unlike many previous studies that focused mainly on pain scores, we comprehensively documented the onset and duration of block, side effects, rescue EBP, and patient satisfaction, thereby providing a more complete evaluation of its clinical utility. These findings and prior evidence suggest that while EBP remains an effective option, TNSPG block offers a safe, practical, and less invasive alternative for managing PDPH. Larger randomized controlled trials are warranted to confirm these results and refine protocols for optimal use.

This study was limited by its small sample size and single-centre design, which may restrict the generalizability of findings. The absence of long-term follow-up prevented assessment of sustained efficacy. Additionally, variability in pain perception and patient response to interventions may have influenced outcomes despite standardized protocols.

CONCLUSION

The TNSPG block represents a minimally invasive, rapid, safe, and straightforward technique with a low complication rate. In our study, it demonstrated analgesic efficacy, reduced rescue analgesic requirements, and patient satisfaction comparable to EBP. While EBP remains an established treatment for PDPH, its invasive nature and associated risks highlight the value of TNSPG block as a practical alternative. Future randomized controlled trials with larger sample sizes are warranted to validate these findings and to establish stand-

ardized protocols for optimizing outcomes.

DECLARAÇÃO DE CONTRIBUIÇÃO / *CONTRIBUTORSHIP STATEMENT*

SS: Obteve aprovação ética, recolha de dados, análise, implementação do protocolo, redigiu o manuscrito e revisão crítica do manuscrito.
RM: Realizou a maioria das cirurgias, recolha de dados, análise, implementação do protocolo, redigiu o manuscrito e revisão crítica do manuscrito.
DEM: Recolha de dados, análise, desenho do estudo e revisão crítica do manuscrito.
Todos os autores aprovaram a versão final a ser publicada.

SS: Obtained ethics approval, data collection, analysis, protocol implementation, wrote the manuscript, and critical review of the manuscript.
RM: Performed most of the surgeries, data collection, analysis, protocol implementation, wrote the manuscript, and critically reviewed of the manuscript.
DEM: Data collection, analysis, study design and did a critical review of the manuscript.
All authors approved the final version to be published.

Responsabilidades Éticas
Conflitos de Interesse: Os autores declaram a inexistência de conflitos de interesse na realização do presente trabalho.
Fontes de Financiamento: Não existiram fontes externas de financiamento para a realização deste artigo.
Confidencialidade dos Dados: Os autores declaram ter seguido os protocolos da sua instituição acerca da publicação dos dados de doentes.
Proteção de Pessoas e Animais: Os autores declaram que os procedimentos seguidos estavam de acordo com os regulamentos estabelecidos pela Comissão de Ética responsável e de acordo com a Declaração de Helsínquia revista em 2024 e da Associação Médica Mundial.
Proveniência e Revisão por Pares: Não comissionado; revisão externa por pares.

Ethical Disclosures
Conflicts of Interest: The authors have no conflicts of interest to declare.
Financing Support: This work has not received any contribution, grant or scholarship.
Confidentiality of Data: The authors declare that they have followed the protocols of their work center on the publication of patient data.
Protection of Human and Animal Subjects: The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and those of the Code of Ethics of the World Medical Association (Declaration of Helsinki as revised in 2024).
Provenance and Peer Review: Not commissioned; externally peer-reviewed.

Submissão: 1 de julho, 2025 | Received: 1th of July, 2025
Aceitação: 29 de setembro, 2025 | Accepted: 29th of September, 2025
Publicado: 2 de outubro, 2025 | Published: 2nd of October, 2025

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