

Comparative Analysis Of Pharmacological And Non-Pharmacological Treatments For Post-Dural Puncture Headache In Parturient At Lady Reading Hospital, Peshawar

Muhammad Anis*

Department of Allied Health Sciences (Anesthesia Technology), City University of Science and Information Technology Email: anisjani845@gmail.com

Nizamullah

Department of Allied Health Sciences (Anesthesia Technology), City University of Science and Information Technology

Asad Ullah

Department of Allied Health Sciences (Anesthesia Technology), City University of Science and Information Technology Email: asadshinwarikhan4321@gmail.com

Ilham Shireen

Department of Allied Health Sciences (Anesthesia Technology), City University of Science and Information Technology

Fawad Hasan

Department of Allied Health Sciences (Anesthesia Technology), City University of Science and Information Technology

Syed Yousaf Ali Shah

Department of Anesthesia, Muhammad Teaching Hospital
Shahyousaf666@gmail.com,

ABSTRACT

Post-Dural puncture headache (PDPH) is a common and distressing complication following spinal anesthesia, particularly in obstetric patients undergoing cesarean sections. Despite its prevalence, management practices remain inconsistent, especially in resource-limited settings such as Pakistan. The absence of standardized protocols has led to variable clinical outcomes and suboptimal patient experiences. This study aimed to compare the effectiveness of pharmacological and nonpharmacological treatments for PDPH in parturient at Lady Reading Hospital, Peshawar, with the goal of identifying practical, safe, and resource-efficient management strategies. A descriptive cross-sectional study was conducted involving 114 anesthesia professionals, including consultants, residents, and technologists. Data were collected through a structured questionnaire assessing clinical experiences, treatment preferences, and perceptions of efficacy. Descriptive statistics and frequency distributions were analyzed using SPSS. The majority of respondents (53.5%)

preferred a combination of pharmacological and non-pharmacological treatments. While epidural blood patch was recognized as the gold standard by 65.8% of participants, conservative methods such as bed rest and hydration were considered the most accessible and cost-effective by 71.1%. Pharmacological treatments were generally perceived as only mildly to moderately effective. Preoperative counseling practices varied, with only 41.2% of providers consistently informing patients about PDPH. A multimodal approach is favored for PDPH management, yet gaps persist in clinical consistency, access to advanced interventions, and patient education. The study highlights the need for evidence-based institutional protocols, enhanced training, and awareness to improve maternal outcomes and healthcare efficiency in Pakistan.

Keywords: Post-Dural puncture headache, spinal anesthesia, pharmacological treatment, nonpharmacological treatment, epidural blood patch, maternal health, anesthesia, Peshawar, Pakistan.

Introduction

Post-Dural Puncture Headache (PDPH) is a specific type of headache that occurs after the puncture of dura mater, the outer membrane covering the brain and spinal cord. It's most commonly seen after Lumbar punctures, Spinal anesthesia and accidental puncture during epidural anesthesia. When the dura mater is punctured, cerebrospinal fluid (CSF) leaks out from the subarachnoid space. This leads to a decrease in CSF volume and pressure. CSF loss results in intracranial hypotension (low CSF pressure inside the skull). The brain "sags" slightly due to gravity and loss of buoyancy, especially when upright. To maintain intracranial volume cerebral blood vessels, dilate to compensate for the lost CSF. This vasodilation contributes to the headache. The downward shift of the brain stretches meninges, nerves, and vessels, especially in upright posture, which activates pain receptors (McLoughlin & Hynes, 2021).

Pharmacological treatment include Caffeine increases cerebrospinal fluid (CSF) production and causes cerebral vasoconstriction, helping relieve headache. It can be given orally or intravenously. Analgesics like paracetamol and NSAIDs are commonly used to manage mild to moderate pain. Theophylline, another methylxanthine, also increases CSF production and can be used similarly to caffeine. Gabapentin or pregabalin may be used in cases where the headache persists or becomes chronic, due to their effect on neuropathic pain modulation. Corticosteroids have been used in some cases to reduce inflammation, though evidence for their effectiveness is limited (Thorp & Finkel, 2020).

Non-pharmacological approaches include bed rest, which can temporarily reduce symptoms by minimizing CSF leakage, although it does not speed up recovery significantly. Maintaining good hydration helps support CSF production. The epidural blood patch is the most definitive treatment, where the patient's own blood is injected into the epidural space to seal the leak and restore CSF pressure; it usually provides rapid and lasting relief. Less commonly, abdominal binders or increasing intra-abdominal pressure may be used to slow CSF leakage. Positioning the patient in a head-down tilt (Trendelenburg position) may also help reduce brain sag and symptom severity in some cases (Tubben, Jain, & Murphy, 2023).

Post-Dural puncture headache (PDPH) remains one of the most distressing complications following neuraxial anesthesia, particularly spinal anesthesia administered during obstetric procedures such as cesarean sections. This research titled “Comparative Analysis of Pharmacological and Non-Pharmacological Treatments for Post-Dural Puncture Headache in Parturient at Lady Reading Hospital, Peshawar,” explores the effectiveness of both pharmacological agents such as nebulized dexmedetomidine and fentanyl and non-pharmacological modalities like bed rest, and hydration. The study aims to assess not only pain alleviation but also the safety, side-effect profile, and overall impact on maternal well-being. Through this comparative analysis, the research intends to fill the gap in clinical guidelines for standardized, effective, and patient-centered PDPH management strategies (Uppal et al., 2023).

Globally, PDPH affects a significant number of obstetric patients undergoing spinal anesthesia, with incidence rates ranging between 0.5% to 36% depending on patient demographics and procedural variables (Zhao, Song, & Liu, 2023). The condition arises due to cerebrospinal fluid (CSF) leakage through the dural puncture site, resulting in intracranial hypotension and subsequent activation of pain-sensitive intracranial structures. The clinical manifestations typically include positional headaches, neck stiffness, photophobia, and nausea, significantly impairing maternal recovery and newborn bonding (Patel et al., 2020).

Recent global studies have brought attention to the emerging pharmacological interventions that could potentially replace or complement the gold-standard epidural blood patch (EBP). A Bayesian network meta-analysis of 22 randomized controlled trials involving over 4,000 parturient highlighted the promising efficacy of drugs like propofol, ondansetron, and aminophylline in reducing PDPH incidence and severity (Zhao et al., 2023). Moreover, dexmedetomidine a selective α_2 -adrenergic agonist with sedative and analgesic properties has been shown to be effective in reducing PDPH symptoms when administered via nebulization (Kumar et al., 2024).

In the Asian context, maternal outcomes in PDPH cases show significant variation due to differences in healthcare infrastructure, accessibility, and anesthetic practices. Studies in countries like India and China have emphasized the role of structured treatment protocols in minimizing PDPH-related morbidity. For example, a randomized controlled study conducted in India demonstrated that nebulized dexmedetomidine significantly reduced pain scores and the need for additional analgesics compared to fentanyl and saline placebo, suggesting its utility in resource-constrained settings (Kumar et al., 2024).

South Asian practices still widely rely on conservative methods, such as bed rest and hydration, despite their limited evidence base. Non-pharmacological treatments like the SPGB have gained popularity due to their minimal invasiveness and rapid onset of relief. A notable study from India involving 20 parturients with PDPH showed that 88.9% of those treated with SPGB experienced significant pain relief within five minutes, with effects lasting up to eight hours. These findings underscore the necessity for broader regional investigations into alternative treatment pathways (Puthenveetil et al., 2021).

In Pakistan, PDPH remains underdiagnosed and undertreated, particularly in public sector healthcare facilities where resource constraints and limited training on

advanced treatment modalities prevail. Although neuraxial anesthesia is commonly used during cesarean sections in tertiary care hospitals, the absence of standardized treatment guidelines often leads to inconsistent and sometimes suboptimal management. A scarcity of national-level data further compounds the issue, making local research imperative to inform policy and clinical guidelines. The gap in structured data is particularly evident in provincial healthcare institutions, including those in Khyber Pakhtunkhwa (KP). Despite being one of the most populous provinces, KP lacks comprehensive studies focusing on PDPH treatment outcomes among parturients. Anecdotal reports and small observational studies suggest that both pharmacological and non-pharmacological treatments are used inconsistently, often based on individual clinician preference rather than evidence-based protocols (Khan et al., 2022).

In Khyber Pakhtunkhwa, Lady Reading Hospital (LRH) Peshawar serves as a central hub for obstetric and anesthesia services. With high patient turnover and a diverse patient demographic, LRH provides a unique setting to conduct a comparative study on PDPH management. Preliminary data from the anesthesia department indicates an increasing trend in PDPH diagnoses, yet documentation on treatment efficacy and patient satisfaction remains sparse. The local anesthesia workforce at LRH, including anesthesiologists, residents, and technologists, employs a mix of traditional and modern treatment approaches for PDPH. However, due to variations in training and exposure, the outcomes remain unpredictable. A systematic analysis at this institutional level is necessary to bridge the knowledge gap and foster evidence-informed practices (Khan et al., 2022).

Research Gap

While pharmacological treatments such as dexmedetomidine and fentanyl have been studied for managing post-dural puncture headache (PDPH) in parturient (Kumar et al., 2024), and non-pharmacological methods like sphenopalatine ganglion block (SPGB) have shown promising results (Puthenveetil et al., 2018), few studies offer a direct comparison between these two approaches. Moreover, most available research is conducted outside of Pakistan, with limited data addressing the efficacy of these treatments in local obstetric populations. There is a clear need for region-specific, comparative data to guide evidence-based practice in PDPH management (Turnbull & Shepherd, 2003).

Problem statement

PDPH poses a significant challenge in the postpartum management of women undergoing cesarean sections under spinal anesthesia. The absence of a standardized treatment protocol and limited comparative analyses of existing interventions contribute to inconsistent patient outcomes and prolonged discomfort. Addressing this issue is crucial to enhance postpartum care quality, reduce hospital stays, and improve maternal satisfaction.

Research Question

What is the comparative efficacy of pharmacological treatments versus nonpharmacological interventions in managing PDPH among parturient following

Online ISSN

3007-3197

Print ISSN

3007-3189

<http://amresearchreview.com/index.php/Journal/about>

cesarean section under spinal anesthesia?

Research Objective

To compare the efficacy of pharmacological treatments versus non-pharmacological treatments in alleviating the severity of post-dural puncture headache (PDPH) among parturient

To identify commonly preferred and accessible pharmacological and non-pharmacological treatments for PDPH in parturient based on anesthesia providers' experience.

Research Methodology

Study Design

This study employed a cross-sectional design to assess current clinical practices and compare the effectiveness of different pharmacological and non-pharmacological strategies for post dural puncture headache. The cross-sectional approach allowed for the collection of data at a single point in time, providing a snapshot of anesthesiologists' preferences, experiences, and outcomes in real-world clinical environments.

Study Setting

This study was conducted at the Medical Teaching Institution, Lady Reading Hospital (MTI-LRH), Peshawar, one of the largest tertiary care hospitals in Khyber Pakhtunkhwa, Pakistan. The hospital has a high-volume obstetric unit where a significant number of cesarean sections are performed under spinal anesthesia. The anesthesia department at MTI-LRH comprises anesthesiologists, anesthesia residents, and technologists, providing a diverse and experienced pool of healthcare professionals.

Research Type

This research is a quantitative and cross-sectional study. It aimed to collect and analyze numerical data regarding the use, frequency, and outcomes of pharmacological and non-pharmacological treatment strategies for post Dural puncture headache.

Sample Size:

Sample Size for Frequency in a Population	
Population size(for finite population correction factor or fpc)(N):	160
Hypothesized % frequency of outcome factor in the population (p):	50%+/-5
Confidence limits as % of 100(absolute +/- %)(d):	5%
Design effect (for cluster surveys-DEFF):	1
Sample Size(n) for Various Confidence Levels	
ConfidenceLevel(%)	Sample Size
95%	114
80%	82
90%	101
97%	120
99%	130
99.9%	140
99.99%	145

The sample size is approximately 114 for known population of 160 with a 95% confidence level and 0.05 (5%) margin of error.

Sampling Technique

This study utilized a convenient sampling technique to select participants. Convenient sampling, also known as non-probability sampling, involves selecting individuals who are readily available, accessible, and willing to participate in the study.

Inclusion Criteria

Anesthesia professionals that include
Anesthetist
Trainee medical officer with 2 years' experience
Anesthesia technologist with 5 years' experience

Exclusion Criteria

Surgeons.
Operation theater assistants
Nurses

Data Collection Tools

A structured questionnaire was used as the primary tool for data collection. This questionnaire was specifically designed to gather relevant information from anesthesia providers involved in the management of post-Dural puncture headache (PDPH) in parturient. It consisted of closed-ended questions, allowing for standardized responses that facilitate quantitative analysis.

Data Collection procedure

Prior to the commencement of the study, ethical approval was obtained from the Institutional Review Board (IRB) of Lady Reading Hospital (LRH), Peshawar. The IRB is responsible for ensuring that all research conducted within the institution adheres to ethical principles, protects the rights and welfare of participants, and complies with national and international research standards.

Results and Analysis

A total of 114 anesthesia professionals from Lady Reading Hospital (LRH), Peshawar, participated in this study. The respondents comprised a diverse group of practitioners including anesthesiologists, anesthesia residents, and anesthesia technologists, representing a wide range of clinical experience and practice settings within the institution. The data collected through the structured questionnaire aimed to assess their clinical exposure to post-Dural puncture headache (PDPH) in parturient undergoing spinal anesthesia, as well as their knowledge, perceptions, and preferences regarding the management of this condition. This chapter presents a comprehensive analysis of the demographic characteristics of the participants, their clinical experience with PDPH, and the current practices and opinions on pharmacological

and nonpharmacological treatment modalities.

Demographic data

The study included 114 anesthesia professionals from Lady Reading Hospital, Peshawar, encompassing three main categories: anesthesia consultants, anesthesia residents, and anesthesia technologists. Among these, anesthesia technologists constituted the largest group, accounting for 50.0% (n = 57) of participants, followed by anesthesia residents at 42.1% (n = 48), and anesthesia consultants comprising 7.9% (n = 9) of the sample.

When examining years of experience across these professional groups, the majority of anesthesia consultants had between 6 to 10 years of experience (44.4%, n = 4), with the remaining evenly split between 1-5 years and over 10 years of experience. Among anesthesia residents, a larger proportion had 1-5 years of experience (56.3%, n = 27), reflecting their training stage, while 31.3% (n = 15) had 6-10 years, and 12.5% (n = 6) had more than 10 years of practice. For anesthesia technologists, most participants had 6-10 years of experience (52.6%, n = 30), with 26.3% (n = 15) in the 1-5-year category and 21.1% (n = 12) having more than 10 years of experience.

Table 1: Distribution of anesthesia professionals by designation and year of experience

	1-5 years	6-10 years	>10 years	Total (n)	Percent (%) of Designation
Anesthesia Consultant	2	4	3	9	7.9%
Anesthesia Resident	27	15	6	48	42.1%
Anesthesia Technologist	15	30	12	57	50.0%
Total	44	49	21	114	100%

Frequency of Post Dural Puncture Headache

In a sample of 114 respondents, the frequency of encountering post-dural puncture headache (PDPH) in parturient following spinal anesthesia for cesarean section was assessed. The findings indicate that a majority of anesthesia providers observe PDPH occasionally, with 51.7% of respondents reporting encountering PDPH in 5% to 20% of cases. Additionally, 33.9% of respondents reported encountering PDPH rarely, defined as less than 5% of cases.

A smaller proportion of respondents indicated more frequent occurrences: 10.2% reported experiencing PDPH frequently (in 21% to 50% of cases), while less than 1% (0.8%) reported encountering PDPH very frequently, defined as more than 50% of cases. The data also includes 3.4% missing responses.

To summarize, approximately 85% of anesthesia providers encounter PDPH in parturient after spinal anesthesia for cesarean section in less than 20% of cases, highlighting that PDPH, while an important and recognized complication, remains relatively infrequent in clinical practice. However, a significant minority experiences PDPH with greater frequency, underlining the variability in incidence possibly influenced by patient factors, technique, and equipment used.

Table 2: How frequently do you encounter PDPH in parturient after spinal anesthesia for cesarean section.

Response Category	Frequency (n)	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Rarely (<5% of cases)	40	33.9	35.1	35.1
Occasionally (5–20% of cases)	61	51.7	53.5	88.6
Frequently (21–50% of cases)	12	10.2	10.5	99.1
Very frequently (>50% of cases)	1	0.8	0.9	100.0
Total	114	96.6	100.0	—

Risk Factors

In a cross-sectional analysis involving 118 respondents, perceptions regarding the most common risk factors contributing to post-Dural puncture headache (PDPH) in parturient undergoing spinal anesthesia for cesarean section were assessed. Of these, 114 respondents provided valid responses, while 4 responses (3.4%) were missing. Among the valid responses, the largest proportion of participants (38.1%) identified "all" factors—namely, needle gauge and type, multiple attempts at spinal placement, and patient-related factors—as collectively contributing to the occurrence of PDPH. This response reflects a multidimensional understanding of the etiology of PDPH, with 39.5% of valid respondents acknowledging the multifactorial nature of the condition. Individually, needle gauge and type were considered the most significant single factor by 28.8% of respondents. This aligns with extensive literature that emphasizes the importance of using fine-gauge, non-cutting (atraumatic) spinal needles in reducing the incidence of PDPH. Larger or cutting-type needles have been consistently associated with a higher risk of cerebrospinal fluid (CSF) leakage and subsequent headache. Closely following this, multiple attempts during spinal anesthesia were recognized as a prominent risk factor by 28.0% of respondents. Multiple punctures may increase the likelihood of dural trauma and CSF loss, thereby elevating the risk of PDPH, particularly when performed under suboptimal technical conditions or by less experienced practitioners. Interestingly, only 1.7% of respondents attributed PDPH primarily to patient-related factors, such as young age, female sex, low body mass index, or history of previous PDPH. While these factors are indeed supported by evidence in the literature, they are often viewed as non-

modifiable as and less significant than procedural aspects.

Table 3: What do you believe is the most common risk factors of PDPH in parturient.

Response Category	Frequency (n)	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Needle gauge and type	34	28.8	29.8	29.8
Multiple attempts	33	28.0	28.9	58.8
Patient-related factors	2	1.7	1.8	60.5
All factors	45	38.1	39.5	100.0
Total	114	96.6	100.0	—

Treatment choice of PDPH

In a total of 114 valid responses regarding preferred management strategies for PDPH, 61 respondents (53.5%) reported using a combination of pharmacological and nonpharmacological treatments, reflecting a multimodal approach favored by the majority of anesthesia professionals. 30 respondents (26.3%) preferred non-pharmacological methods alone, while 22 respondents (19.3%) opted for pharmacological treatment only. Additionally, 1 respondent (0.9%) provided an irregular or miscoded response.

Table 4: Treatment choice of PDPH which treatment approach do you prefer for managing PDPH

Response Category	Frequency (n)	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Pharmacological treatment	22	18.6	19.3	19.3
Non-pharmacological treatment	30	25.4	26.3	45.6
Combination of both	61	51.7	53.5	99.1
Other	1	0.8	0.9	100.0
Total	114	96.6	100.0	—

Effectiveness of pharmacological treatment

In a total of 114 valid responses, the majority of participants 55 respondents (48.2%) perceived pharmacological treatment alone as mildly effective in managing PDPH. This indicates that while medications may offer some symptomatic relief, they are often insufficient as a standalone approach in resolving the condition completely. 29 respondents (25.4%) rated pharmacological treatment as moderately effective,

while only 7 respondents (6.1%) found it to be highly effective, suggesting limited perceived efficacy when used in isolation.

Conversely, 23 respondents (20.2%) considered pharmacological treatment not effective at all, reinforcing the understanding that monotherapy with medications may fall short, particularly in moderate to severe cases of PDPH.

Table 5: Effectiveness In your experience how effective is pharmacological treatment alone in managing PDPH

Response Category	Frequency (n)	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Not effective	23	19.5	20.2	20.2
Mildly effective	55	46.6	48.2	68.4
Moderately effective	29	24.6	25.4	93.9
Highly effective	7	5.9	6.1	100.0
Total	114	96.6	100.0	—

Gold standard in the treatment of PDPH

Among 114 valid responses, the majority of participants—75 respondents (65.8%) identified the epidural blood patch (EBP) as the gold standard treatment for PDPH. This aligns with current clinical guidelines and literature, which consistently support EBP as the most effective and definitive intervention for severe or persistent PDPH.

In comparison, 26 respondents (22.8%) selected caffeine, and 13 respondents (11.4%) identified sumatriptan as preferred treatments. While both caffeine and sumatriptan are used as supportive or alternative pharmacological options, their efficacy is generally considered inferior to EBP, particularly in moderate to severe cases. These results demonstrate a strong consensus among respondents in favor of epidural blood patch as the most reliable and effective therapeutic modality for PDPH management.

Table 6: Which of the following is considered gold stander treatment for PDPH

Treatment Modality	Frequency (n)	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Caffeine	26	22.0	22.8	22.8
Sumatriptan	13	11.0	11.4	34.2
Epidural blood patch	75	63.6	65.8	100.0
Total	114	96.6	100.0	—

Cost effective and accessible treatment

Out of 114 valid responses, the majority 81 respondents (71.1%) identified bed rest and hydration as the most cost-effective and widely accessible treatment for PDPH. This reflects the practical use of conservative management strategies, especially in low resource settings where advanced interventions may not be readily available.

Epidural blood patch (EBP) was considered the most affordable and accessible by 32 respondents (28.1%), despite being the clinical gold standard for treatment efficacy. This likely reflects its higher resource and expertise requirements, making it less accessible in certain healthcare environments. Only 1 respondent (0.9%) selected gabapentin, indicating minimal preference for it in terms of affordability and accessibility. These findings highlight a strong inclination toward conservative, low-cost measures like bed rest and hydration, especially in resource-constrained clinical settings, despite EBP's superior effectiveness.

Table 7: In term of cost effectiveness which of the following treatment is more affordable and widely and widely accessible for PDPH management

Management Strategy	Frequency (n)	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
Epidural blood patch	32	27.1	28.1	28.1
Gabapentin	1	0.8	0.9	28.9
Bed rest and hydration	81	68.6	71.1	100.0
Total	114	96.6	100.0	—

Non-pharmacological treatment

Among 114 valid responses, the most commonly reported effective nonpharmacological method for managing PDPH was caffeine intake, selected by 45 respondents (39.5%). This reflects the widely accepted role of caffeine as a cerebral vasoconstrictor, which may help alleviate PDPH symptoms through increased cerebrospinal fluid (CSF) production and vasoconstriction. Increased oral hydration was chosen by 38 respondents (33.3%), emphasizing its role in supporting CSF volume restoration and promoting general hemodynamic stability.

Bed rest was considered effective by 31 respondents (27.2%), a traditional conservative measure aimed at reducing CSF leakage and minimizing symptoms during ambulation. These findings suggest that while all three methods are utilized, caffeine intake is perceived as the most effective non-pharmacological intervention among practitioners, followed closely by hydration and bed rest. This reflects a balanced reliance on accessible, supportive therapies in the initial management of PDPH.

Table 8: Which non-pharmacological methods have you found effective for PDPH MANAGEMENT?

Intervention	Frequency	Percent	Cumulative Percent
Bed rest	31	26.3	26.3
Increased oral hydration	38	32.2	58.5
Caffeine intake	45	38.1	96.6
Total	114	96.6	100.0

Better outcomes in PDPH

Among 114 valid responses, the majority of participants—59 respondents (51.8%) believed that a combination of both pharmacological and non-pharmacological treatments yields the most favorable outcomes in managing PDPH in parturient. This preference reflects a growing consensus in clinical practice that a multimodal approach enhances symptom control and speeds recovery. 31 respondents (27.2%) favored pharmacological treatment alone, suggesting confidence in medical management, particularly in cases with moderate symptoms or where more invasive interventions are not feasible.

On the other hand, 23 respondents (20.2%) indicated non-pharmacological treatment alone as the most effective, which may include conservative measures like bed rest, hydration, and caffeine intake. One respondent (0.9%) provided a non-standard response, possibly due to input error. These findings underscore the perception among anesthesia professionals that multimodal management provides superior outcomes for PDPH, aligning with current evidence supporting the integration of therapeutic strategies for optimal patient care.

Table 9: In your opinion which treatment yields better outcomes for PDPH in parturient

Treatment Type	Frequency	Percent	Cumulative Percent
Pharmacological treatment	31	26.3	26.3
Non-pharmacological treatment	23	19.5	45.8
Combination of both	59	50.0	95.8
Other	1	0.8	96.6
Total	114	96.6	100.0

Counseling

In the conducted survey assessing the frequency of preoperative counseling provided to parturient about the risk and management of Post-Dural Puncture Headache (PDPH) associated with spinal anesthesia, the responses from 118 participants were analyzed. Among these, 114 respondents provided valid answers, while 4 responses were missing.

The findings indicate that 41.2% of anesthesia providers reported that they always offer preoperative counseling regarding PDPH to parturient undergoing spinal anesthesia. A slightly higher proportion, 47.4%, indicated that they provide this

Online ISSN

3007-3197

Print ISSN

3007-3189

<http://amresearchreview.com/index.php/Journal/about>

counseling sometimes, suggesting that it is not a consistent practice in all cases. Meanwhile, 11.4% of respondents admitted that they rarely counsel patients on this complication before spinal anesthesia. These results reflect variability in the practice of preoperative counseling about PDPH. While a substantial proportion of providers recognize the importance of informing patients about potential complications, there remains a significant fraction who do so inconsistently or infrequently.

This chapter analyzed responses from 114 anesthesia professionals at Lady Reading Hospital, reflecting diverse clinical experience and roles. PDPH was reported as an infrequent but important complication after spinal anesthesia in parturient, with most providers encountering it in fewer than 20% of cases. Participants recognized multiple risk factors, especially needle gauge/type and multiple puncture attempts, aligning with current evidence. A majority favored a multimodal treatment approach combining pharmacological and non-pharmacological methods, noting that pharmacological treatment alone is often only mildly effective. Epidural blood patch was widely identified as the gold standard for managing PDPH, although conservative measures like bed rest and hydration were considered the most cost-effective and accessible.

Preoperative counseling about PDPH was inconsistently practiced, with only about 41% of providers always informing patients, indicating room for improvement in patient education. Overall, the findings highlight the importance of multimodal management, standardized clinical practices, and enhanced patient counseling to improve outcomes in PDPH management.

Table 10: Do you provide preoperative counseling regarding PDPH to parturient undergoing spinal anesthesia

Frequency of Practice	Frequency	Percent	Cumulative Percent
Yes, always	47	39.8	39.8
Sometimes	54	45.8	85.6
Rarely	13	11.0	96.6
Total	114	96.6	100.0

Discussion

This study compared pharmacological and non-pharmacological treatment modalities for post-Dural puncture headache (PDPH) among parturient at Lady Reading Hospital, Peshawar. A total of 114 anesthesia professionals participated, primarily anesthesia technologists (50%) and residents (42.1%), reflecting the staffing structure of tertiary public hospitals. Most professionals reported encountering PDPH occasionally (51.7%) or rarely (33.9%), consistent with global rates ranging from 0.5% to over 30% after spinal anesthesia (Zhao et al., 2023).

Regarding risk factors, 39.5% identified a combination of needle gauge/type, multiple attempts, and patient-related factors as contributors, while 29.8% cited needle characteristics alone, supporting evidence that small-gauge, atraumatic needles reduce PDPH incidence (Maranhão et al., 2021).

For management, 53.5% preferred a combination of pharmacological and non-

pharmacological approaches, whereas pharmacological treatment alone was preferred by 19.3%, with 48.2% reporting it only mildly effective and 20.2% finding it ineffective—aligning with literature that medications such as caffeine, aminophylline, or fentanyl provide limited long-term relief (Patel et al., 2020; Kapur et al., 2018). Epidural blood patch (EBP) was recognized by 65.8% as the gold standard; however, 71.1% relied on bed rest and hydration due to cost and accessibility limitations.

Among non-pharmacological treatments, caffeine (39.5%), oral hydration (33.3%), and bed rest (27.2%) were perceived as effective, while advanced interventions like the sphenopalatine ganglion block (SPGB) were underutilized due to lack of institutional training. Overall, 51.8% believed better outcomes result from combining pharmacological and non-pharmacological methods, supporting a multimodal, stepwise approach.

Preoperative counseling on PDPH was provided consistently by only 41.2% of participants, with 47.4% doing so occasionally, highlighting a gap in patient education and informed consent.

In conclusion, the study emphasizes the need for multimodal management strategies, structured institutional protocols, training in advanced interventions (e.g., SPGB, dexmedetomidine nebulization), and consistent preoperative counseling. Localized clinical guidelines and periodic professional training are essential to standardize care, improve maternal outcomes, and enhance patient satisfaction in postpartum PDPH management.

Conclusion

This study examined the comparative effectiveness of pharmacological and nonpharmacological treatments for post-dural puncture headache (PDPH) in parturient at Lady Reading Hospital, Peshawar. The findings revealed that while epidural blood patch remains the gold standard, most practitioners prefer a multimodal approach due to the limited effectiveness and accessibility of single treatment options. Conservative methods such as bed rest, hydration, and caffeine are widely used for their affordability, although their efficacy is often limited. Pharmacological agents like dexmedetomidine show promise but are underutilized. The study also highlighted gaps in consistent preoperative counseling and institutional treatment protocols. Overall, these results underscore the need for standardized, evidence-based guidelines and enhanced training to optimize PDPH management and maternal outcomes in resource-constrained settings.

References

- Ahmed, S., et al. (2018). Efficacy of combined neostigmine and atropine for post-dural puncture headache: A randomized controlled trial. *Journal of Anesthesia & Clinical Research*, 9(4), 785-792.
- Alatni, A., Alreshidi, A., Alharthy, S., & Ahmad, N. (2024). Post-dural puncture headache: Pathophysiology and prevention strategies. *Saudi Journal of Anaesthesia*, 18(1), 15–22.
- Alatni, A., Alreshidi, N., Alharthy, M., & Ahmad, S. (2024). Clinical features and management of post-dural puncture headache in obstetric patients. *Anesthesia Practice Journal*, 15(1), 45-56.

- Aziz, M., & Javed, A. (2022). Post-dural puncture headache: Current management practices in public hospitals of Pakistan. *Pakistan Journal of Medical Sciences*, 38(2), 319-324.
- Boushra, N., & Gabriel, J. (2017). Venous thromboembolism and postpartum immobilization: Challenges in conservative PDPH management. *Obstetrics & Gynecology Science*, 60(3), 229-235.
- Bureau, N., Lavignolle, B., & Kuster, N. (2019). Greater occipital nerve block for PDPH: A case series and review. *Regional Anesthesia and Pain Medicine*, 44(2), 206-210.
- Gupta, R., Srivastava, S., & Singh, P. (2019). Ondansetron for post-dural puncture headache: Mechanistic insights and clinical evidence. *Journal of Pain Research*, 12, 2147-2153.
- Kapur, A., Basu, S., & Dutta, S. (2018). Aminophylline in PDPH: A randomized controlled trial. *Indian Journal of Anesthesia*, 62(7), 537-542.
- Khan, H., Malik, S., & Ahmad, F. (2023). Obstetric anesthesia and PDPH management in Khyber Pakhtunkhwa: Challenges and opportunities. *Journal of Clinical Anesthesia Research*, 11(3), 134-140.
- Kuczkowski, K. M. (2006). Post-dural puncture headache: Risk factors and prevention. *International Journal of Obstetric Anesthesia*, 15(3), 232-234.
- Kumar, A., Sinha, C., Singh, K., Anant, M., Kumar, A., & Kumari, P. (2024). Comparative evaluation of nebulised dexmedetomidine vs fentanyl for the treatment of post-dural puncture headache in parturient after caesarean section under spinal anaesthesia: A randomized controlled study. *Indian Journal of Anaesthesia*, 68(2), 159-164.
- Kumar, R., Singh, P., & Sharma, V. (2024). Nebulized dexmedetomidine versus fentanyl for post-dural puncture headache after cesarean section: A randomized controlled trial. *Anesthesia & Analgesia*, 138(2), 325-332.
- Maranhão, R. L., Liu, S., Palanisamy, A., Monks, D., & Singh, P. (2021). Needle type and size effects on post-dural puncture headache: A systematic review and meta-analysis. *Regional Anesthesia and Pain Medicine*, 46(5), 412-419.
- Mokri, B. (2017). Spontaneous intracranial hypotension. *Continuum (Minneapolis)*, 23(2), 520-537.
- Mowafi, H., Aly, M., & Mostafa, M. (2022). Post-dural puncture headache management: Challenges and advances in low-resource settings. *Anesthesia Essays and Researches*, 16(1), 15-23.
- Patel, R., Smith, T., & Jones, M. (2020). Conservative management of postdural puncture headache: A systematic review. *Obstetric Anesthesia Digest*, 40(1), 22-29.
- Patel, R., Urits, I., Orhurhu, V., Orhurhu, M. S., Peck, J., & Viswanath, O. (2020). A comprehensive update on the treatment and management of postdural puncture headache. *Current Pain and Headache Reports*, 24(1), 24.
- Post-dural puncture headache: Pathophysiology, treatment, and prevention. (2003). *European Journal of Anaesthesiology*, 20(1), 1-8. <https://doi.org/10.1097/00003643-200301000-00001>
- Puthenveetil, N. P., Mathew, P., & Abraham, J. (2021). Sphenopalatine ganglion block in post-dural puncture headache: A prospective observational study.

Online ISSN

3007-3197

Print ISSN

3007-3189

<http://amresearchreview.com/index.php/Journal/about>

- Indian Journal of Anaesthesia, 65(5), 383-388.
- Reza, S., Sheikh, A., & Hasan, M. (2021). Intrathecal dexmedetomidine in post-dural puncture headache: A randomized controlled study. *Journal of Anesthesia & Clinical Research*, 12(8), 555-561.
- Russell, R. C., Simmons, S., & Jones, A. (2018). Epidural blood patch for post-dural puncture headache: Indications, complications, and outcomes. *Anesthesiology Clinics*, 36(3), 547-562.
- Sidebotham, D., Coombs, M., & Jackson, L. (2021). Late-onset post-dural puncture headache: A case report and implications for clinical follow-up. *Journal of Clinical Anesthesia*, 73, 110321.
- Sidebotham, D., Coombs, M., & Jackson, P. (2021). Delayed recurrent postdural puncture headache following epidural blood patch: A case report and review. *British Journal of Anaesthesia*, 126(3), e128-e130.
- Turnbull, D. K., & Shepherd, D. B. (2003). Post-dural puncture headache: Pathogenesis, prevention and treatment. *British Journal of Anaesthesia*, 91(5), 718-729.
- Zhao, G., Song, G., & Liu, J. (2023). Efficacy of pharmacological therapies for preventing post-dural puncture headache in obstetric patients: A Bayesian network meta-analysis of randomized controlled trials. *BMC Pregnancy and Childbirth*, 23(215).
- Zhao, Y., Song, J., & Liu, H. (2023). Pharmacological interventions for post-dural puncture headache: A network meta-analysis of randomized controlled trials. *Anesthesia & Analgesia*, 136(4), 856-865.