

# A Comparative Study Between Greater Occipital Nerve Block And Sphenopalatine Ganglion Nerve Block In The Treatment Of Post Dural Puncture Headache

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## Abstract:

**Background:** Epidural blood patch has been the gold standard for the treatment of PDPH since the beginning. Alternative minimally invasive methods like greater occipital nerve block and sphenopalatine ganglion block in the treatment of PDPH might reduce the adverse effects and allow bedside intervention in treating patients. Primary aim is to compare the efficacy between the two techniques.

**Methods:** 32 patients with PDPH belonging to ASA I and II were included in the study. They were randomly allocated into Group S and Group O, 16 in each group. Group S received sphenopalatine ganglion block 3ml mixture of lignocaine 2% 2ml with 4mg dexamethasone 1ml on either nostril and group O received Greater occipital nerve block using the same mixture on each side of occipital region. Using Numeric rating scale severity of headache was assessed at 30 minutes, 1<sup>st</sup> hour, 2<sup>nd</sup> hour, 3<sup>rd</sup> hour, 6<sup>th</sup> hour and 12<sup>th</sup> hour in both supine and sitting position. Rescue analgesic with Inj. Diclofenac 75mg IV given when the block failed.

**Conclusion:** Relief from headache seen in both the groups with onset being faster in Group O and NRS score <4 maintained throughout the period of study i.e., 12hours with significant p value <0.05 in both the groups. Both the blocks are equally efficacious in relieving PDPH. But better patient compliance is seen with sphenopalatine ganglion block.

**Keywords:** Post-Dural puncture headache, Sphenopalatine ganglion nerve block, Greater occipital nerve block.

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## I. Introduction

Post-Dural puncture headache is a well-known entity to anesthesiologists practicing central neuraxial blockade. Patients usually present with bilateral symmetrical headache with postural variation, with headache increasing in sitting position and relieved with recumbent position. The headache can be associated with neck stiffness, hypoacusia, photophobia, nausea. Gold standard treatment for PDPH has been Epidural blood patch which required injecting 15-20ml of patient's autologous blood into the epidural space at the previous point of entry leading to clot formation over the defect preventing further CSF leak. Even this method is not without any side effects. In search of better methods that enable better patient compliance, early discharge from hospital and lesser adverse effects lead to Sphenopalatine ganglion block and greater occipital nerve block. These techniques were used in the treatment of chronic headache and migraines.

## II. Materials And Methods

### Statistical Analysis

Two newer techniques were compared Sphenopalatine ganglion block and greater occipital nerve block instead of Epidural blood patch for the treatment of PDPH. The study involving 32 patients divided into two groups with each group enrolled with 16 subjects each was conducted in Sri Siddhartha medical college, Tumkur.

Sample size calculated using formula

$$n = \frac{2^* \{Z_{(1-\alpha/2)} + Z_{1-\beta}\}^2 * \sigma^2}{d^2} = 16$$

Primary outcome variable = NRS Score

Z value for 5% level of significance  $Z_{(1-\alpha/2)} = 1.96$

Z value for 80% power  $Z_{1-\beta} = 0.84$

Assumed standard deviation ( $\sigma$ ) = 1

Effect size (d) = 1

Minimum sample size required is 16 in each group = 32

**Materials required:**

Patients belonging to ASA I and ASA II Patients who complained of headache corresponding to numerical rating scale >4 in an upright position after subarachnoid block with 25G Quincke needle at L3-L4 interspace were selected for the study.

Baseline numerical rating score of headaches noted both in sitting and supine position. Patients were randomly allocated into two groups Group S receiving Sphenopalatine ganglion block and Group O receiving Greater Occipital nerve block.

- Sphenopalatine ganglion block – 16G epidural catheter is inserted trans-nasally along the anterior nasal passage and are placed superior to the middle nasal turbinate. Catheter tip to be positioned medial, inferior and posterior and the study drug (3ml mixture of lignocaine 2% 2ml with 4mg dexamethasone) is administered.

- Greater Occipital Nerve block – with the patient in sitting position external occipital protuberance is identified. A point is marked 3-3.5cm below the occipital protuberance. Another line is drawn from at 1.5-2cm lateral to the point on either side. GON is usually located medial to the artery. At this point, local infiltration with 2%Lignocaine with adrenaline (1ml) infiltrated followed by the study drug combination that is 3ml mixture of lignocaine 2% 2ml with 4mg dexamethasone on either side of the occipital protuberance.

Once the study drug was administered, headache in both sitting and standing position assessed using numerical rating score at 30 minutes, 1<sup>st</sup> hour, 2<sup>nd</sup> hour, 3<sup>rd</sup> hour, 6<sup>th</sup> hour and 12<sup>th</sup> hour.

If patient continues to complain of PDPH with NRS >6 after 6 hours of administration of the drug, current plan was aborted and opted for analgesics with Inj. Diclofenc 75mg IV and Epidural blood patch.

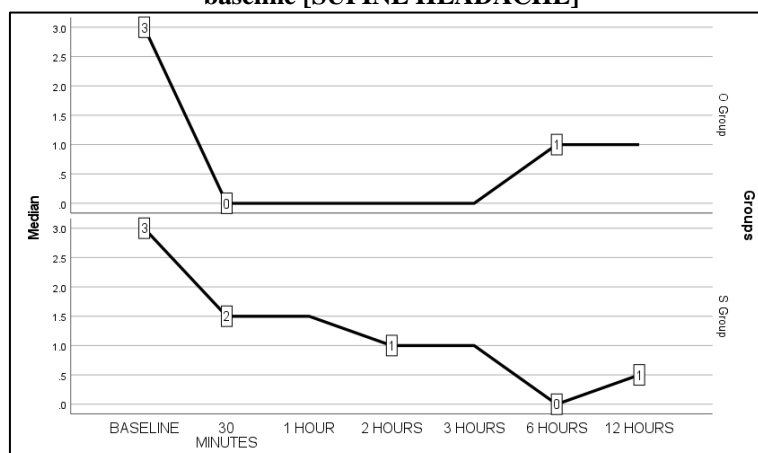
**III. Results And Discussion**

**Table 1:** Comparison of scores between groups and within groups at each time points compared to baseline [SUPINE HEADACHE]

SUPINE HEADACHE	O Group (N=16)	S Group (N=16)	P-value between Groups #
<b>BASELINE</b>	3.0 (0.5-4.8)	3.0 (2.0-4.0)	0.657
<b>30 MINUTES</b>	0.0 (0.0-0.0) P*=0.003	1.5 (1.0-2.8) P*=0.012	<0.001
<b>1 HOUR</b>	0.0 (0.0-0.0) P*=0.002	1.5 (1.0-2.8) P*=0.012	<0.001
<b>2 HOURS</b>	0.0 (0.0-0.0) P*=0.002	1.0 (1.0-1.0) P*=0.002	<0.001
<b>3 HOURS</b>	0.0 (0.0-1.0) P*=0.002	1.0 (1.0-1.0) P*=0.002	0.003
<b>6 HOURS</b>	1.0 (0.0-1.8) P*=0.011	0.0 (0.0-0.0) P*=0.001	0.002
<b>12 HOURS</b>	1.0 (0.0-1.0) P*=0.007	0.5 (0.0-1.0) P*=0.003	0.297

Data are presented as median (Interquartile Range). P value is significant if < 0.05. #Mann Whitney U-test (between groups). \*Wilcoxon Signed Rank test (P value compared to the baseline value inside each group).

**Figure 1:** Comparison of scores between groups and within groups at each time points compared to baseline [SUPINE HEADACHE]

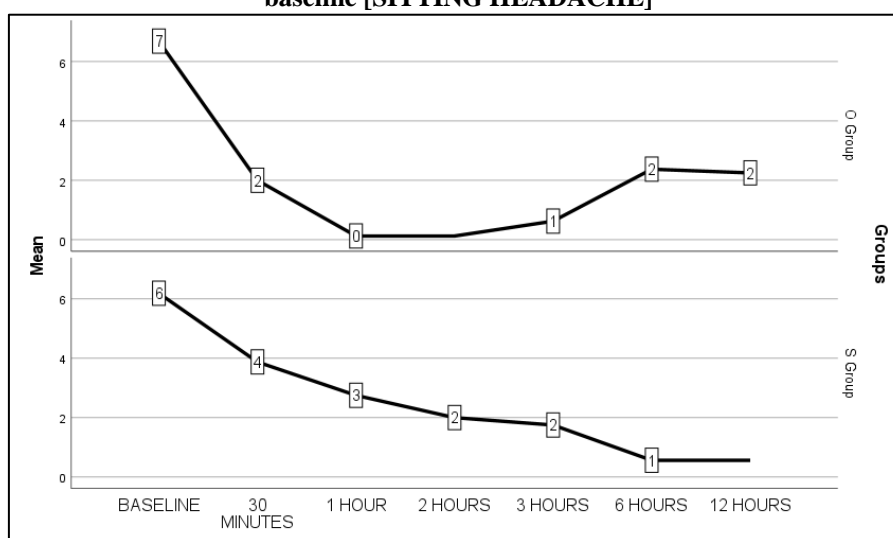


**Table 2:** Comparison of scores between groups and within groups at each time points compared to baseline [SITTING HEADACHE]

SITTING HEADACHE	O Group (N=16)	S Group (N=16)	P-value between Groups #
<b>BASELINE</b>	6.5 (5.3-8.0)	6.0 (5.0-7.0)	0.346
<b>30 MINUTES</b>	2.5 (0.0-3.8) P* $<$ 0.001	4.0 (3.0-4.8) P*0.001	0.010
<b>1 HOUR</b>	0.0 (0.0-0.0) P* $<$ 0.001	2.5 (2.0-4.0) P* $<$ 0.001	$<$ 0.001
<b>2 HOURS</b>	0.0 (0.0-0.0) P* $<$ 0.001	2.0 (1.0-3.0) P* $<$ 0.001	$<$ 0.001
<b>3 HOURS</b>	0.5 (0.0-1.0) P* $<$ 0.001	1. (1.0-2.0) P* $<$ 0.001	0.001
<b>6 HOURS</b>	1. (1.3-3.0) P* $<$ 0.001	0.0 (0.0-1.0) P* $<$ 0.001	$<$ 0.001
<b>12 HOURS</b>	2.5 (1.3-3.0) P* $<$ 0.001	1. (0.0-1.0) P* $<$ 0.001	$<$ 0.001

Data are presented as median (Interquartile Range). P value is significant if  $<$  0.05. #Mann Whitney U-test (between groups). \*Wilcoxon Signed Rank test (P value compared to the baseline value inside each group).

**Figure 2:** Comparison of scores between groups and within groups at each time points compared to baseline [SITTING HEADACHE]



Adequate analgesia was not achieved for one of the subjects from Group O receiving greater occipital nerve block following which epidural blood patch was opted as the treatment

Both the groups showed significant decrease in the sitting and supine headache as per numerical rating scale for the treatment of post Dural puncture headache with a significant (p value  $<$ 0.05).

Greater occipital nerve block (Group N P\* $<$ 0.001) showed greater reduction in the numerical rating scale for post Dural puncture headache by 2<sup>nd</sup> hour of administration of the drug in comparison to sphenopalatine ganglion block (Group S P\* $<$ 0.001).

#### IV. Discussion

In a study conducted by Hamdy Abbas Youssef et al comparing sphenopalatine ganglion block with greater occipital nerve block for the treatment of post dural puncture headache post cesarean section observed a significant drop in NRS score in both sitting and supine position at 30 minutes which remained the same throughout the follow up period of 48 hours. Similar observation can be seen in our study with significant reduction in the headache at 30mins and continued so for 12 hours which was the duration of the study. (Interquartile range at 30mins (Group O 2.5(0.03.8) P\* $<$ 0.001) and (Group S 4.0 (3.0-4.8) P\*0.001)<sup>1</sup>

Nitu Puthenveettil et al concluded in their study that about 88.89% patients in group who received sphenopalatine ganglion block had adequate pain relief within 5 min of block (P  $<$  0.001). Pain was significantly lower in Group with sphenopalatine ganglion block with 2% Lignocaine for up to 8 h, with no adverse effects compared to patients treated with inj. Paracetamol 1g intravenously 8<sup>th</sup> hourly for 24 hours. Thus, we opted for sphenopalatine ganglion block than conservative management<sup>2</sup>.

G. Niraj M D and colleagues performed an audit of the modified guidelines for the management of post dural puncture headache on 24 patients. Out of which 19 patients failed conservative management and were

given choice of greater occipital nerve block and epidural blood patch, one patient chose epidural blood patch. Headache was resolved in 12 patients (66%) out of 18 who received greater occipital nerve block, six patients had partial response and were treated with epidural blood patch<sup>3</sup>.

### **V. Conclusion And Acknowledgement**

Greater occipital nerve block and sphenopalatine nerve block are both equally efficacious in relieving post dural puncture headache.

But better patient co-operation was seen with sphenopalatine ganglion nerve block.

Transnasal topical sphenopalatine ganglion block and ultrasound guided greater occipital nerve block could make the block easier and successful in relation to accuracy and patient compliance.

### **References**

- [1]. Youssef HA, Abdel-Ghaffar HS, Mostafa MF, Abbas YH, Mahmoud AO, Herdan RA. Sphenopalatine Ganglion versus Greater Occipital Nerve Blocks in Treating Post-Dural Puncture Headache after Spinal Anesthesia for Cesarean Section: A Randomized Clinical Trial. *Pain Physician*. 2021;11.
- [2]. Puthenveettil N, Rajan S, Mohan A, Paul J, Kumar L. Sphenopalatine ganglion block for treatment of post-dural puncture headache in obstetric patients: An observational study. *Indian J Anaesth*. 2018 Dec;62(12):972-7.
- [3]. G. Niraj, Aditi Kelkar, Vandana Girotra, Greater occipital nerve block for postdural puncture headache (PDPH): A prospective audit of a modified guideline for the management of PDPH and review of the literature, *Journal of Clinical Anesthesia*, Volume 26, Issue 7, 2014, Pages 539-544, ISSN 0952-8180, <https://doi.org/10.1016/j.jclinane.2014.03.006>.

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