



## INCIDENCE OF POSTDURAL PUNCTURE HEADACHE: A COMPARATIVE STUDY WITH USING 25G & 26G SPINAL QUINCKE NEEDLE AND MEDIAN AND PARAMEDIAN APPROACHES.

### Anaesthesiology

**Manish Singh Chauhan**

PG Resident, Department Of Anaesthesia, Government Medical College, Kota, Rajasthan, India

**Ajay Kumar Gupta\***

PG Resident, Department Of Anaesthesia, Government Medical College, Kota, Rajasthan, India \*Corresponding Author

### ABSTRACT

**Background-** Postdural Puncture headache (PDPH) remains the most frequent complication of central neuraxial blockade. It can occur following uncomplicated spinal anesthesia as well as accidental dural puncture in epidural anesthesia.

**Methods-** In the hospital based prospective study of 200 subjects of ASA grade I and II ranging from 18 to 45 years who underwent lower segment caesarean section under spinal anesthesia were taken into consideration.

**Results-** In comparison there was no significant difference from that of 25- and 26-gauge Quincke needles midline and paramedian approach (8.00%, 4.00%, 4.00%, 2.00% respective). All cases of PDPH were mild in nature

**Conclusion-** No significant difference from that of 25- and 26-gauge Quincke needles was observed and paramedian approach using quincke level needle reduces the incidence of PDPH.

### KEYWORDS

Spinal anesthesia, LSCS, Postdural Puncture headache (PDPH), 25-Gauge Quincke needle, 26-Gauge Quincke needle

### INTRODUCTION

Spinal anesthesia also called spinal analgesia or subarachnoid block is a form of regional anesthesia and a kind of neuraxial block involving injection of opioids, local anesthetics or other permissive drug into the subarachnoid space.<sup>1</sup>

It has a very rapid onset and provides a dense neural block which can produce highly effective pain relief for a wide variety of indications and may decrease patient morbidity after major surgery, moreover, failures are very infrequent<sup>2</sup>

Postdural Puncture headache(PDPH) remains the most frequent complication of central neuraxial blockade. It can occur following uncomplicated spinal anesthesia as well as accidental dural puncture in epidural anesthesia. The International headache society has defined PDPH as a bilateral headache that develops within 7 days after lumbar puncture and disappears within 14 days<sup>3</sup>. The headache worsens within 30 minutes of assuming the upright position and disappears or improves within 30minutes of resuming recumbent position. PDPH is associated with any one of the symptoms like neck stiffness, nausea, vomiting, tinnitus, photophobia, decreased hearing.

We thought it worthwhile to test some way of reducing the incidence of PDPH while still following the vogue of 23G Quincke needles. Moreover small gauge needles have some limitations of their own e.g. difficulty in dural puncture, relatively high failure rate, need to use introducer, cost etc<sup>4</sup>. On the other hand midline approach involves passage of needle through supraspinal, interspinal and ligamentum flavum, the paramedian approach avoids supra and interspinal ligaments and hits ligamentum flavum directly after passing through para spinal muscles<sup>5,6</sup>.

In a comparative study of the 25 gauge whitacre with 25 and 26 gauge Quincke needles for the production of PDPH at National Defense Center at Taipei, it was found that the incidence of PDPH was 1.06%with 25 G Whitacre which was of no significant difference from that of 25 and 26 G Quincke needles 3.65% and 2.06% respectively).

Although the difference was not statistically significant, it was concluded that the 25 gauge Whitcare spinal needle caused a lower incidence and less severity of PDPH than the 25 and 26 gauges Quincke needles.<sup>7</sup>

Due to limited study in our region the present study was conducted with the aims of study the incidence of PDPH with 25 and 26 gauges Quincke needles.

### MATERIAL AND METHODS

**Type of study-** Hospital based prospective.

**Inclusion criteria-** ASA grade I and II ranging from 18 to 45 years who underwent lower segment caesarean section under spinal anesthesia.

**Exclusion criteria-** Patient who had history of allergic rhinitis, ophthalmic or neurological problems along with otolaryngological problems and those with history of acute-chronic headache were excluded from the study.

In the hospital based prospective study 200 subjects of ASA grade I and II ranging from 18 to 45 years who underwent lower segment caesarean section under spinal anesthesia were taken into consideration. These patients were given pre operatively i.e., about 30 minutes prior to operation, injection atropine 0.6 mg.IM and intravenous line using 18G IV cannula was established and Ringer lactate solution started. Under thorough aseptic precautions spinal anesthesia was given using 50 patients used 25G Quincke needle & 50 patients used 26G Quincke needle using midline approach. 50 patients used 25G Quincke needle & 50 patients used 26G Quincke needle using paramedian approach. Injection of 0.5% bupivacaine (sensorcaine-Heavy solution) 1.8ml was then injected in the space between the third and fourth lumbar vertebrae. All post-operative headaches of patients who had undergone operation under spinal analgesia were not taken as PDPH. In this study only those patients who have post-operative headaches which fulfills the key features of PDPH were taken into consideration<sup>7</sup>

By using a standardized headache severity scale, the presence and absence of the headache was assessed.

Clinical presentation of PDPH: Severity

0 – No headache.

- 1- Mild PDPH (VAS score 1-3) slight restriction of daily activities. Patient is not bedridden and no associated symptoms.
- 2- Moderate PDPH (VAS score 4-7) significant restriction of daily activities. Patient is bedridden part of the day. Associated symptoms may or may not be present.
- 3- Severe PDPH (VAS score 8-10) incapacitating headache, impossible to sit up. Associated symptoms were always present.

### Data analysis:

Data was recorded on a Performa. The data analysis was computer based; SPSS-22 was used for analysis. For categorical variables chi-square test will be used. For continuous variables independent samples's *t*-test was used. *p*-value <0.05 was considered as significant.

### RESULTS

**Table 1. Age wise distribution**

Age	25 gauge Quincke midline	26 gauge Quincke midline	25 gauge Quincke paramedian	26 gauge Quincke paramedian
Mean	23.68	24.01	23.32	23.73
SD	5.61	5.98	5.82	5.42
P-value	0.832(NS)			

In present study mean age in 25 gauge Quincke midline group was 23.68±5.61 Yrs, in 26 gauge Quincke midline group was 24.01±5.98 Yrs, 25 gauge Quincke paramedian group was 23.32±5.82 Yrs, in 26 gauge Quincke paramedian group was 23.73±5.42 Yrs

**Table 2. Incidence of PDPH**

PDPH	25 gauge Quincke midline	26 gauge Quincke midline	25 gauge Quincke paramedian	26 gauge Quincke paramedian
Present	4(8.00%)	2(4.00%)	2(4.00%)	1(2.00%)
Absent	46(92.00%)	48(96.00%)	48(96.00%)	49(98.00%)
Total	50(100.00%)	50(100.00%)	50(100.00%)	50(100.00%)
P-value	0.726(NS)			

In comparison there was no significant difference from that of 25- and 26-gauge Quincke needles midline and paramedian approach (8.00%, 4.00%, 4.00%, 2.00% respective).

**Table 3. Severity of PDPH**

Severity of PDPH	25 gauge Quincke midline	26 gauge Quincke midline	25 gauge Quincke paramedian	26 gauge Quincke paramedian
Mild	4(100.00%)	2(100.00%)	2(100.00%)	1(100.00%)
Moderate	0(0.00%)	0(0.00%)	0(0.00%)	0(0.00%)
Severe	0(0.00%)	0(0.00%)	0(0.00%)	0(0.00%)

In our study all cases of PDPH were mild in nature.

## DISCUSSION

A PDPH is usually a self-limiting process. If left untreated 75% of them will resolve within the first week and 88% will have resolved by 6 weeks. The incidence of PDPH after the use of a standard spinal needle (Quincke) is dependent on the size of the needle. In young female patient's incidence of PDPH is approximately 15% when using 25 G needles and 5% when using 26 G needle. A significant reduction in PDPH from 6.3% to 2.5% is seen if using 27 G needle instead of 26 G needle in obstetric patients. Many workers have studied the development of PDPH following spinal anesthesia by using different needles.<sup>8</sup>

In a study at Magee-Women's Hospital at Pittsburgh, the incidences of PDPH following administration of spinal anesthesia in obstetrics cases using five different needles namely, 26G Atrucan, 25G Quincke, 24G Gertie Marx (GM), 24G Sprotte and 25G Whitacre were 5%, 8.7%, 4%, 2.8% and 3.1% respectively of the 1002 cases studied. The use of 25G Quincke had a higher incidence of PDPH than the Sprotte or Whitacre needles.<sup>9</sup>

In an in vitro study<sup>10</sup> of dural lesions produced by 25G Quincke and Whitacre needles, it was found that the area of the dural lesions produced by 25G Quincke needles 15 minutes after they have been withdrawn was 0.023 mm in the external aspect (epidural surface) and 0.034 mm in the internal aspect (arachnoid surface), whereas the areas of lesions produced by 25G Whitacre were 0.026 mm and 0.030 mm in the external and internal surfaces respectively.

## CONCLUSION

No significant difference from that of 25- and 26-gauge Quincke needles was observed and paramedian approach using quincke level needle reduces the incidence of PDPH.

## REFERENCES

1. Wulf HF. The centennial of spinal anesthesia. *Anesthesiology*. 1998;89:500-6.
2. Flaatten H, Rodt SA, Rosland J, Vannes J. Postoperative headache in young patients after spinal anesthesia. *Anesthesia*. 1987;42:202-5.
3. Smith EA, Thorburn J, Duckworth RA, Reid JA. A comparison of 25G and 27G Whitacre needles for caesarean section. *Anaesthesia* 1994; 49:859-62
4. Fauzia Bono, Saeeda Haider, Sadqa Aftab, Tipu Sultan. Comparison of 25-G Quincke and Whitacre needles for post dural puncture headache in obstetric patients. *JCPSP* 2004 Vol 14 (11): 647- 650.
5. G. Edward Morgan, Jr. Maged S. Mikhail. *Spinal Epidural and Caudal Blocks*. Clinical Anaesthesiology. (Lange) Second Edition. (Los Angeles) 1995 p 211-244.
6. Lee JA, Arthur Edward, James Barker. 1850-1916. British pioneer of regional analgesia. *Anaesthesia* 1979; 34: 885-91.
7. Hwang JJ, Ho ST, Wang JJ, Liu HS. Postdural puncture headache in caesarean section: comparison of 25G Whitacre and 25G and 26G Quincke needles. *Acta Anaesthesiol Sin* 1997; 35:33-7.
8. Reina MA, de Leon-Casasola OA, Lopez A, De Andres J, Martin S, Mora M. An in vitro study of dural lesions produced by 25G Quincke and Whitacre needle evaluated by scanning electromicroscopy. *Reg Anaesth Pain Med*. 2000; 25:393-402
9. Rushman GB, Davis NJH, Cashman JN. Lee S' Synopsis of Anaesthesia. 12th ed. Oxford: Butterworth-Heinemann, 1989; 685.
10. Vallejo MC, Mandell GL, Sabo DP, Ramanathan S. A randomized comparison of five spinal needles in obstetrics patients. *Anaesth Analg*. 2000; 91:916-20.