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Research Article

**FREQUENCY OF POST DURAL PUNCTURE HEADACHE
(PDPH) IN OBSTETRIC PATIENTS UNDERGOING
CAESAREAN SECTION UNDER SPINAL ANAESTHESIA
WITH TWO SPINAL NEEDLES: 25G QUINCKE AND 27G
QUINCKE**¹Dr. Amjad Siddique, ²Dr. Sadia Yaqoob, ³Dr. Sadaf Bashir¹Senior Registrar, Department of Anesthesiology and ICU, Sheikh Zayed Hospital Rahim Yar Khan²Woman Medical Officer, Department of Anesthesiology, Jinnah hospital Lahore³Woman Medical Officer, SJ Maternity Hospital Sahiwal**Article Received:** December 2019 **Accepted:** January 2020 **Published:** February 2020**Abstract:**

Objective: To compare the frequency of Post Dural Puncture Headache (PDPH) in obstetric patients undergoing Caesarean section under spinal anaesthesia with two spinal needles: 25G Quincke and 27G Quincke.

Material and methods: This randomized controlled trial was conducted at Department of Anesthesiology, Sheikh Zaid Hospital, Rahim Yar Khan from March 2019 to September 2019 over the period of 6 months. Total 80 pregnant women with gestational age more than 37 weeks coming for Caesarean Section having age 20-40 years with ASA scale I and II were selected. PDPH was assessed between the both groups.

Results: Mean age of patients was 28.03 ± 4.88 years, mean age of patients of study group A was 27.80 ± 5.05 years and of study group B was 28.25 ± 4.75 years. Over all prevalence of PDPH was 20%. Out of 80 patients, most (64/80%) of the patients reported no pain followed by mild pain by 7 (9%) patients, moderate pain by 5 (6%) and sever pain by 4 (5%) patients. In group A (25-gauge), PDPH was noted in 12 (30%) patients in group B (27-gauge) PDPH was noted in 4 (10%) patients. Frequency of PDPH was significantly higher in study group A as compared to study group B with p value 0.025.

Conclusion: Use of 27G spinal needle will be a good choice for reduction of PDPH.

Keywords: PDPH, caesarean section, 25G and 27G spinal needle

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INTRODUCTION:

The term spinal anaesthesia was coined in 1885 by Leonard Corning, a neurologist but he does not refer to the escape of cerebro spinal fluid.¹ Karl August beir a German surgeon in 1898 described authentic spinal anaesthesia with mention of cerebro spinal fluid, injection of cocaine, and appropriately short onset of action. This revolutionized the science of anaesthesia.² The first spinal anaesthesia was given for a laborer undergoing resection of tuberculosis ulceration of the ankle at Royal Surgical Hospital of the University of Kiel, Germany.³ Spinal anaesthesia seems to be particularly well suited for caesarean section because of rapid onset of dense block that is achieved, moreover, failures are very infrequent.⁴ However, since the introduction of spinal anaesthesia, post-dural puncture headache has remained a well-recognized complication. The overall incidence of post-dural puncture headache varies from 0.1%-36%.⁵

It may be mild or severe and debilitating headache, and may be associated with neurological symptoms. Post-dural puncture headache occurs very rarely immediately after dural puncture. 60% of PDPHs will begin within 2 days of having had dural puncture, 90% within 3 days, though it may occur up to 14 days later.⁶ Classically PDPH is a bilateral fronto-occipital headache, radiating to the neck and shoulders, exacerbated within 15 minutes of standing or sitting, is aggravated by coughing or straining and is alleviated within 30 minutes of recumbency, and further so by lying prone.⁷ It may be associated with nausea (up to 60% of cases), vomiting, hearing loss, tinnitus, vertigo, dizziness and paraesthesia of the scalp. Photophobia, diplopia, and blindness have also been described.⁸ These symptoms may lead on to grand mal seizures and sub-dural haematomas.

Factors increasing the incidence of post-dural puncture headache are female gender, pregnancy, younger age, history of headache prior to the dural puncture, beveled needle, larger needle and the number of attempts.⁸ Post-dural puncture headache causes considerable morbidity and is a complication that should not to be treated lightly. The parturient is at particular risk of PDPH because of her sex and young age.⁹

The relatively high incidence of postdural puncture headache in the obstetric patients is a major disadvantage of subarachnoid block. The most important modifiable risk factors for patients whose dura is intentionally violated (e.g., spinal anaesthetic, CSE, DPE) are related to the needle selection. Needle gauge is the second most important factor

after tip design that determines the rate of post-dural puncture headache.¹⁰

This study aimed to elaborate the frequency of PDPH between the two needles. The results of this study will guide us to choice spinal needle in management of spinal anaesthesia.

OPERATIONAL DEFINITION**Post Dural Puncture Headache (PDPH):**

Post Dural Puncture Headache was measured by using Visual Analogue Scale (VAS). Pain was measure in term of:

- 0=No pain
- 1-3=Mild pain
- 4-7=Moderate pain
- 8-10=Severe pain.

VISUAL ANALOGUE SCALE¹³

Visual Analogue Scale is a measurement instrument that tries to measure the amount of pain that a patient feels, which ranges across a continuum from none to an extreme amount of pain.

(No pain) 0 1 2 3 4 5 6 7 8 9 10
(Worst Pain)

MATERIAL AND METHODS:

This randomized controlled trial was conducted at Department of Anesthesiology, Sheikh Zaid Hospital, Rahim Yar Khan from March 2019 to September 2019 over the period of 6 months. Total 80 pregnant women with gestational age more than 37 weeks coming for Caesarean Section having age 20-40 years with ASA scale I and II were selected. Patients presenting with foetal distress, toxemia of pregnancy, CVS/CNS disorders, neuromuscular diseases (eg. myopathies and neuropathies), hypovolaemia, acid base disturbances and electrolyte imbalance, obese, infection on the back, on anticoagulant therapy and vertebral anomaly were excluded from the study. Study was approved by the ethical committee and written informed consent was taken from every patient. Selected patients were randomly divided into two groups A and B. Spinal anaesthesia was given to patients of group A with 25 gauge quincke needle to group B with 27 gauge quincke needle.

All patients were fasted for 10-12 hours. After shifting the patient to the operating theatre, IV access was obtained on the forearm with 18 Gauge IV cannula and IV infusion was started with Ringer Lactate. Spinal Anaesthesia was performed with the patient in the sitting position using a 25-gauge Quincke needle for study group A and 27-gauge Quincke needle for study group B at the L3-4 or L4-5 intervertebral spaces. The 0.75% Bupivacaine (1.5

ml) was administered over 30 sec. Patient was turned gently and placed in supine position with left uterine displacement.

After 24 hours of surgery PDPH was assessed by using Visual Analogue Scale (as per operational definition) and recorded on pre-designed proforma along with demographic profile of the patients.

The data will be entered in SPSS V16 for statistical analysis. Quantitative variable like age will be presented as mean \pm SD, while qualitative variable like PDPH will be presented in frequency and percentages. Chi-square test will be applied to compare the frequency of PDPH in both groups. Stratification will be done for age. Post stratification chi-square test will be applied to see the level of significance. P-values \leq 0.05 will be considered statistically significant.

RESULTS:

Total 80 patients undergoing C-section were selected for this study and PDPH was assessed. Mean age of patients was 28.03 ± 4.88 years, mean age of patients of study group A was 27.80 ± 5.05 years and of study group B was 28.25 ± 4.75 years.

Over all prevalence of PDPH was 20%. (Fig. 1) Out of 80 patients, most (64/80%) of the patients reported no pain followed by mild pain by 7 (9%) patients, moderate pain by 5 (6%) and severe pain by 4 (5%) patients. (Fig. 2) Compression of PDPH between the both groups was done. In group A (25-gauge), PDPH was noted in 12 (30%) patients in group B (27-gauge) PDPH was noted in 4 (10%) patients. Frequency of PDPH was significantly higher in study group A as compared to study group B with p value 0.025. (Table 1) Age range in this study was 20-40 years. patients were divided into two age groups i.e. age group 20-30 years and age group 31-40 years. Total 30 (75%) patients of study group A and 27 (67.5%) patients of study group B belonged to age group 20-40 years. PDPH was reported by 8 (26.67%) patients of study group A while in 3 (11.11%) patients of study group B. But the difference of PDPH between the both groups was statistically insignificant with p value 0.186. In age group 31-40 years, total 4 (40%) patients belonged to study group A and 1 (7.69%) patients belonged to study group B. Difference of PDPH between the both groups was statistically significant with p value 0.127. (Table 2)

Fig. 1: Frequency of PDPH

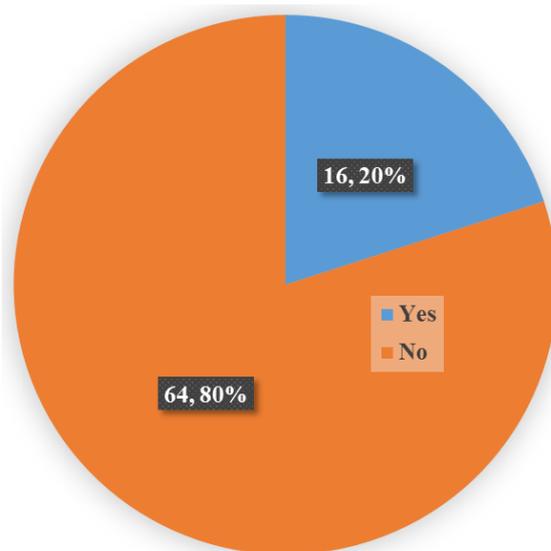


Fig. 2: Severity of pain

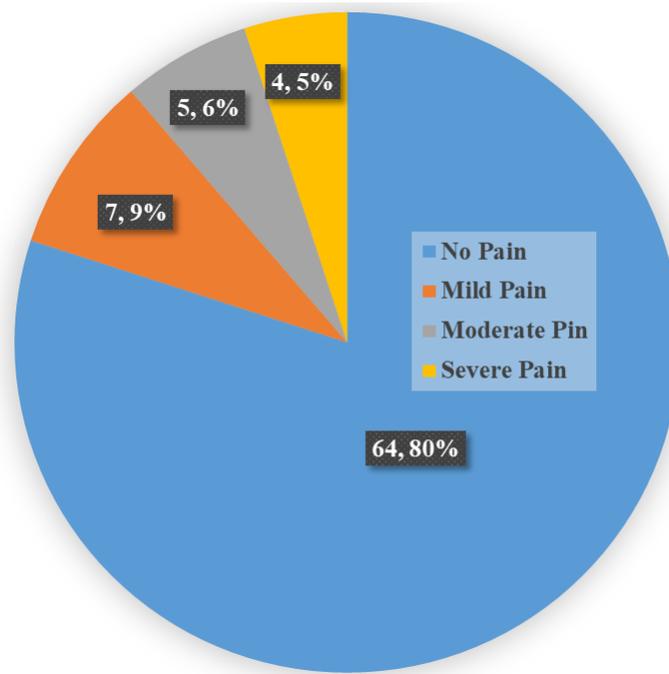


Table 1
Comparison of frequency of PDPH between the both groups

Group	PDPH		Total	P value
	Yes (%)	No (%)		
A (25-gauge)	12 (30%)	28 (70%)	40	0.025
B (27-gauge)	4 (10)	36 (90%)	40	

Table 2: Comparison of frequency of PDPH between the both groups for age groups

Group	PDPH		Total	P value
	Yes (%)	No (%)		
Age group 20-30 years				
A (25-gauge)	8 (26.67%)	22 (73.33%)	30 (75%)	0.186
B (27-gauge)	3 (11.11%)	24 (88.89%)	27 (67.5%)	
Age group 31-40 years				
A (25-gauge)	4 (40%)	6 (60%)	10 (25%)	0.127
B (27-gauge)	1 (7.69%)	12 (92.31%)	13 (32.5%)	

DISCUSSION:

General anaesthesia for Caesarean Section is associated with an increased risk of maternal mortality.¹¹ It is therefore a popular practice to use regional anaesthesia wherever possible.¹² Headache after dural puncture is a complication of spinal anaesthesia and is believed to result from leakage of CSF both at the time of dural puncture and, probably more importantly, continuing leak afterwards.¹³ Post dural puncture headache is a complication that should not be treated lightly. There is the potential for considerable morbidity due to postdural puncture headache and there are reports of PDPH symptoms lasting for months or years, untreated PDPH leading to subdural haematoma¹⁶, and even death from bilateral subdural haematomas.¹⁴⁻¹⁷ Therefore anaesthesiologists are advised to prevent PDPH by optimizing the controllable factors like spinal needle size as well as shape while conducting spinal anaesthesia.¹⁸ Obstetric patients are at high risk of PDPH, being female and under 40 years of age.¹⁹ Indeed, the highest incidence of PDPH is in the parturient and may partly explain the higher incidence of PDPH in females as a whole.²⁰ Diagnosis of dural puncture headache depends upon its association with body position; the pain is aggravated by sitting or standing and relieved or decreased by lying down flat.²¹ Apart from other factors, post dural puncture headache is related to the size as well as type of the spinal needle used.²² Total 80 patients undergoing C-section were selected for this study and PDPH was assessed. Mean age of patients was 28.03 ± 4.88 years, mean age of patients of study group A was 27.80 ± 5.05 years and of study group B was 28.25 ± 4.75 years. Mohammed E L and El Shal S M²³ in a comparable study used 22G, 25G and 29G needles in three groups of parturient mothers. They reported a mean age of 27.8 ± 5.7 years, 27.3 ± 4.9 years and 27.6 ± 5.0 years respectively in the former mentioned needle groups which is comparable with our study.

Over all prevalence of PDPH was 20%. In group A (25-gauge), PDPH was noted in 12 (30%) patients in group B (27-gauge) PDPH was noted in 4 (10%) patients. Frequency of PDPH was significantly higher in study group A as compared to study group B with p value 0.025.

The overall incidence of postdural puncture headache ranges from 0% to 37% as reported by various authors. In one study by Dandona et al,²⁴ the overall incidence of PDPH of 100 C-section patients was 17% and significantly higher incidence is noticed in-group A (25-gauge) than group B (27-gauge) (26% vs 10%, $p < 0.05$). Findings of this study are in agreement with our findings.

In one study by Syed et al,²⁵ overall incidence of PDPH was 14.67%, total 23.68% and 5.4% patients who received spinal anesthesia with 25G and 27G needles respectively developed PDPH. Difference was statistically insignificant. In one study by Rahman et al,²⁶ total 60 (30 in 25-gauge group and 30 in 27-gauge group) patients with ASA physical status I & II scheduled for elective surgical caesarian section under spinal anaesthesia and found PDPH in 16.7% patients of 25-gauge group while in 6.7% patients of 27-gauge group. Difference of PDPH between the both groups was not significant. Results of this study was not in agreement with our study.

The most important modifiable factor determining the incidence of PDPH after spinal anesthesia are needle gauge and tip design. One of the authors reported an incidence of 40% with a 20 G needle, 25% with a 25G needle, 2-10% with a 26G needle, and less than 2% with a 29G needle.²⁷

The incidence of PDPH is $< 2\%$ with 29G Quincke needle, failure of subarachnoid block is common due to technical difficulties with finer gauge needles.²⁸⁻²⁹ Therefore, 25G, 26G, and 27G Quincke needles are in widespread use. In another study conducted by Shah et al on 75 patients to determine the incidence of PDPH following spinal anesthesia with 25G Quincke, 27G Quincke, and 27G Whitacre needles, they found that 9 patients had post-dural puncture headache and the incidence of PDPH was 20%, 12.5% and 4.5% with 25G Quincke, 27G Quincke, and 27G Whitacre needles respectively.³⁰

CONCLUSION:

Although PDPH is a self-limiting and nonfatal condition, its postural nature prevents the patient from performing routine activity and many make them anxious and depressed. Therefore these patients require psychological support and a lot of reassurance in addition to therapeutic measures. Preventive measures like smaller needle size, shape of needles and direction of needle bevel in relation to dural fibers, should always be considered with the hope to decrease the incidence of PDPH. Overall, we concluded that when performing spinal anaesthesia for Caesarean section, 27G Quincke spinal needle has definite advantage over 25G Quincke spinal needles as far as frequency and severity of PDPH is concerned. Therefore we recommend routine use of the 27G Quincke spinal needle when performing spinal anaesthesia for Caesarean section.

REFERENCES:

1. Hinnerk FW, Wulf. The centennial of spinal anesthesia. *Anesthesiology* 1998; 89(2);500-6.

2. Marx GF. The first spinal anesthesia: Who deserves the laurels?. *Reg Anesth Pain Med.* 1994 Nov 1;19(6):429-30.
3. Wulf HF. The centennial of spinal anesthesia. *Anesthesiology.* 1998 Aug;89(2):500-6.
4. Cook TM, Counsell D, Wildsmith JA. Royal College of Anaesthetists Third national audit project. Major complications of central neuraxial block: report on the third national audit project of the Royal College of Anaesthetists. *Br. J Anaesth.* 2009;102:179-90.
5. Kuntz KM, Kokmen E, Stevens JC, Miller P, Offord KP, Ho MM. Post lumbar puncture headache: Experience in 501 consecutive procedure. *Neurology.* 1992;42:1884-7.
6. Leibold RA, Yealy DM, Coppola M, Cantees KK. Post dural puncture headache: Characteristics, management and prevention. *Ann Emerg Med.* 1993;22:1863-70.
7. Syed S, Qayoom N, Naaz S, Mushtaq K, Mir AH, Bijli AH, Ali Z. Comparison of post-dural puncture headache-incidence and severity in obstetric patients after spinal anesthesia for caesarean section with 25G and 27G quincke needle. *Int J Res Med Sci.* 2017 Feb;5(2):596-600.
8. Kamal SM, Hassan GA, Wahba SS. Management of postdural puncture headache: greater occipital nerve block technique. *Ain-Shams Journal of Anaesthesiology.* 2014 Jan 1;7(1):25.
9. Cesur M, Alici HA, Erdem AF, Silbir F, Celik M. Decreased incidence of headache after unintentional dural puncture in patients with caesarean delivery administered with postoperative epidural analgesia. *J Anesth.* 2009;23(1):31-5.
10. Carmel A. Assessment: prevention of post lumbar puncture headache, special article neurology. 2005;909-11.
11. Tortosa JC, Parry NS, Mercier FJ, Mazoit JX, Benhamou D. Efficacy of augmentation of epidural analgesia for Caesarean section. *Br J Anaesth* 2003; 91 (4): 532-5.
12. Choi PT, Galinski SE, Takeuchi L, Lucas S, Tamayo C, Jadad AR. PDPH is a common complication of neuraxial blockade in parturients: a meta-analysis of obstetrical studies. *Can J Anaesth* 2003;50:460-9.
13. Wayne Kleinman, Maged Mikhail Spinal, epidural and caudal blocks. In: GE Morgan, MS Mikhail, MJ Murray. *Clinical Anesthesiology* 4th Edition 2006; p. 319.
14. Eerola M, Kaukinen L, Kaukinen S. Fatal brain lesion following spinal anaesthesia. Report of a case. *Acta anaesthesiol Scand* 1981;25:115-6.
15. Gerritse BM, Gielen MJ. Seven months delay for epidural blood patch in PDPH. *Eur J Anaesthesiol* 1999;16:650-1.
16. Zeidon A, Farhat O, Maaliki H, Baraka A. Does PDPH left untreated lead to subdural haematoma? Case report and review of the literature. *Int J Obstet Anesth* 2006; 15(1):50-8.
17. Grieff J, Cousins MJ. Sub-arachnoid and extradural anaesthesia. In: Nimmo WS, Row Botham DJ, Smith G. *Anaesthesia* 2nd edition Blackwell Scientific Publication London 1994: p1411-54.
18. Gunadyn B, Karaca G. Prevention strategy for postdural puncture headache. *Acta Anaesthesiol Bel* 2006; 57(2):163-5.
19. Ahsan S, Kitchen N, Jenkins C, Margary J. Incidence of postdural puncture headache following spinal anaesthesia for lower segment Caesarean section with 25 gauge polymedic spinal needle. *J Pak Med Assoc* 1996; 46:278-81.
20. Hopkinson JM, Samaan AK, Russell IF, Birks RJS, Patrick MR. A comparative multicentre trial of spinal needles for Caesarean section. *Anaesthesia* 1997; 52:998-1014.
21. Garry M, Davies S. Failure of regional blockade for Caesarean section. *Int J Obstet Anesth* 2002;11:9-12
22. Halpern S, Preston R. Post dural puncture headache and spinal needle design. *Anesthesiology* 1994; 81:1376-83.
23. **Mohammed EL, El-Shal SM. Efficacy of different size Quincke spinal needles in reduction of incidence of Post-Dural Puncture Headache (PDPH) in Caesarean Section (CS). Randomized controlled study. Egyptian Journal of Anaesthesia. 2017; 33:53-58.**
24. **Dandona S, Rawat CMS. Comparison of 25 gauge Quincke needle and 27 gauge Quincke spinal needle in caesarean section for the incidence of post Dural puncture headache: A comparative study. Ijmhr. 2019;5(1):92-97**
25. **Syed S, Qayoom N, Naaz S, Mushtaq K, Mir AH, Bijli AH, et al. Comparison of post-dural puncture headache- incidence and severity in obstetric patients after spinal anesthesia for caesarean section with 25G and 27G quincke needle. Int J Res Med Sci 2017;5:596-600.**
26. Rahman MA, Alam AM, Mandal MA, Kamruzzaman M, Kabir MA, Begum SA, Karmakar CS. Incidence of Postdural Puncture Headache after Caesarean Section Comparison Between 25G and 27G Quincke Variety of Spinal Needle. *KYAMC Journal.* 2017 Aug 31;7(2):762-9.

27. Tumbull DK, Shepherd DB. Post-dural puncture headache: pathogenesis, prevention and treatment. *Br J Anesth.* 2003;91(5):718-29.
28. Flaatten H, Rodt SA, Vamnes J, Rosland J, Wisborg T, Koller ME. Postdural puncture headache. A comparison between 26 and 29 gauge needles in young patients. *Anaesthesia.* 1989;44:147-9.
29. Geurts JW, Haanschoten MC, Van Wijk RM, Kraak H, Besse TC. Postdural puncture headache in young patients. A comparative study between the use of 25G and 29G spinal needles. *Acta Anesthesiol Scand.* 1997;41:779-84.
30. Shah A, Bhatia PK, Tulsiani KL. Postdural puncture headache in caesarean section: A comparative study using 25G Quincke, 27G Quincke and 27G Whitacre Needles. *Indian J Anesth.* 2002;46(5):373-77.