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ORIGINAL ARTICLE

Frequency of headache with 25G or 27G quincke needles after spinal anesthesia in patients undergoing elective cesarean section

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ABSTRACT

Objectives: Post-dural puncture headache (PDPH) is an iatrogenic complication of spinal anesthesia which results from puncture of the dura mater. The signs and symptoms of PDPH are thought to be caused due to loss of cerebrospinal fluid, traction on the cranial contents and reflex cerebral vasodilation. The patient's age, sex and the size of the dural perforation are the two most important factors affecting the frequency and severity of PDPH. We aimed to compare the frequency of post-dural puncture headache (PDPH) with 25G quincke needle and 27G quincke needle in spinal anesthesia in patients undergoing elective cesarean section.

Methodology: This randomized controlled trial was carried out in our anesthesiology department over a period of six months from 1st December 2014 to 30th May 2015. A total of 124 parturients, ASA physical status I to II undergoing cesarean section were included in this study. Patients with infection at the site of injection, severe hypovolemia, coagulopathy, raised intracranial pressure, severe aortic and mitral stenosis, severe preeclampsia, placenta previa grade II-IV, placenta accreta and twin pregnancy were excluded from the study. Enrolled parturients were divided into two groups A and B, with 62 patients in each group. In Group-A and Group-B, Quincke spinal needles 25G and 27 G were used respectively to administer spinal anesthesia in the sitting position at the L3-4 or L4-5 intervertebral spaces. PDPH was assessed after 6, 12, 24 and 48 hours of surgery. Qualitative variable are presented as frequency and percentages while quantitative variable like age was presented as mean ± SD. Sample t-test was applied on quantitative variable age. Chi-square test was applied for comparison of PDPH. A P- value < 0.05 was considered statistically significant.

Results: The ages of patients were between 18 to 40 years. Mean age of the patients in Group-A was 27.77 ± 4.82 y and 27.74 ± 4.30 y in Group-B. Nine patients (14.5%) of Group-A experienced PDPH as compared to 2 patients (3.2%) of Group-B. There was statistically significant difference (p = 0. 027) between the groups.

Conclusion: We conclude that 27G quincke spinal needle has definite advantage over 25G quincke spinal needle in terms of frequency of PDPH in spinal anesthesia for cesarean sections.

Key words: Spinal Anesthesia; Spinal needle; Cesarean Section; Post-dural puncture headache

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INTRODUCTION

General anesthesia when given for cesarean section has relatively greater maternal risks as compared with regional anesthesia. Therefore, spinal anesthesia has become more widely practiced anesthetic technique in cesarean delivery because it is easy to administer, immediately effective and produces excellent operating conditions.[1] Spinal Anesthesia provides adequate postoperative analgesia, avoids fetal as well as maternal risks of general anesthesia and requires minimum postoperative anesthesia care.[2] Post-dural puncture headache (PDPH) is an iatrogenic complication of spinal anesthesia which results from puncture of the dura mater. The signs and symptoms of PDPH are caused due to loss of cerebrospinal fluid, traction on the cranial contents and reflex cerebral vasodilation.[3] The patient's age and the size of the dural perforation are the two most important factors affecting the frequency and severity of PDPH and because of her sex and young age, a parturient is at a particular risk of PDPH.[4] Twenty nine gauge or finer gauge spinal needles are technically more difficult to use and are associated with a high failure rate for spinal anesthesia while 25G, 26G and 27G needles represent the adequate needle size for spinal anesthesia.[5] The overall incidence of PDPH ranges from 0 to 30% as reported by Zeger et al.[6] The aim of this study was to find out the frequency of PDPH between the two spinal needles in the obstetric patients undergoing cesarean sections.

METHODOLOGY

This study was carried out over a period of six months from 01-12-2014 to 30-05-2015 in our department of anesthesiology. A sample size of 124 patients was calculated with a level of significance as 5% and power of study as 90% by using an OpenEpi calculator freely available on internet (http://www.openepi.com/SampleSize/SSCC.htm). After taking approval from Institutional Review Board, all pregnant women of 18 to 45 years of age and ASA physical status I and III with gestational age more than 37 weeks scheduled for elective cesarean section at our hospital were included in the study. Patients with infection at the site of injection, severe hypovolemia, coagulopathy, raised intracranial pressure, severe aortic and mitral stenosis, severe preeclampsia, placenta previa grade II-IV, placenta accreta and twin pregnancy were excluded from the study. After clinical examination by the obstetrician, base line investigations were carried out which included blood complete picture, urine routine examination, coagulation profile and hepatitis B and C screening. Detailed preanesthesia evaluation ruled out if any comorboids, previous history of surgery, history of allergy, addiction or drug consumption, and use of dentures. Detailed general physical examination and systemic examination were carried out, airway was assessed patient prepared for surgery and anesthesia. Written informed consent about the procedure and intervention was obtained from all patients. Sampling was done by consecutive probability technique. Patients were placed randomly in two groups by coin toss method. Group-A and Group-B. All the patients were fasted for 10-12 hours before procedure.

After shifting the patient to the operating room, IV access was obtained on the forearm with 18G IV cannula. For aspiration prophylaxis, inj metoclopramide 10 mg and inj ranitidine 50 mg were given. After preloading the patient with Ringers lactate solution 7 ml/kg for 15 min, spinal anesthesia was administered with the patient in the sitting position at the L3-4 or L4-5 intervertebral spaces using a 25G Quincke needle for study Group-A and 27G Quincke needle for study Group-B under strict asepsis. To minimally cut the dural fibers, the bevel of the needle tip was kept longitudinal and 0.75% hyperbaric bupivacaine (1.5 ml) was injected into subarachnoid space. Patients were gently placed in supine position with left uterine displacement by placing a wedge under the right side of the abdomen. PDPH was assessed after 6, 12, 24 and 48 hours of surgery. It was defined as non-radiating severe headache felt in frontal or occipital areas, which increased in severity in upright position and decreased when patient lied down or drank plenty of fluids.

For statistical analysis, the data was entered in SPSS version 16. Qualitative variable like frequency of PDPH was presented as number and percentage while quantitative variable like age was presented as mean ± SD. Sample t-test was applied on quantitative variable age. For comparison of PDPH Chi-square test was applied. A $p < 0.05$ was considered statistically significant.

RESULTS

A total of 124 patients (62 in each group) were included. Ages of patients ranged between 18 to 40 years. The mean age of the patients was 27.77 ± 4.82 and 27.74 ± 4.30 y in Group-A and B respectively. Nine patients (14.5%) of Group-A and 2 patients (3.2%) of Group-B experienced PDPH. Statistically, there was significant difference between two groups (p

Table 1: Comparative frequency of PDPH
[data given as n (%)]

PDPH	Group-A (25G Quincke)	Group-B (27G Quincke)	Chi square	p
Yes	09 (14.5)	02 (3.2)	4.888	0.027

Table 2: Distribution of cases by severity of pain.
Data given as n (%)

Severity of pain	Group-A n = 62	Group-B n = 62	Chi square	p
No pain	53 (85.5)	60 (96.8)	5.100	0.165
Mild pain	1 (01.6)	0		
Moderate pain	5 (08.1)	1 (01.6)		
Severe pain	3 (04.8)	1 (01.6)		

= 0. 027) as shown in Table 1.

In group-A 1 patient (1.6%) had mild pain, 5 patients (8.1%) had moderate and 3 patients (4.8%) had severe pain. On the other hand in group-B 1 patient (1.6%) had moderate and 1 patient (1.6%) had severe pain. There was statistically significant difference between two groups (p = 0.165) (Table-2)

DISCUSSION

In cesarean section, spinal anesthesia is a safe and widely practiced anesthetic technique. Despite of all the advantages, complications may occur in spinal anesthesia. PDPH is a serious complication of spinal anesthesia and its incidence is more, particularly in parturients.[7] The incidence of PDPH is grossly reduced after the introduction of thinner spinal needles.[8,9,10] The reported frequency of PDPH ranges from 4%[11] to 40%[12], when 25G Quincke spinal needle is used in young females. The incidence of PDPH with 27G Quincke needle ranges from 1.1% to 12.8%.[13] However, in a study conducted by Muhammad et al.[14] frequency of PDPH was 0% with 27G Quincke in this group of patients. The incidence was 8.5% in a study by Vitanen et al.[15] It was mild in 4% moderate in 3% and severe in 1% of patients. Symptoms may start on first or second day after spinal injection and can last for 3 days. In another study by Jabbari et al,[5] the PDPH incidence was found to be as high as 17.3% with 25G Quincke needle. However in a study by Shaikh et al.,[13] the incidence of PDPH was 8.3% and 3.7% with 25G Quincke needle and 27G Quincke needles respectively. The frequency of PDPH with 25G Quincke needle was found to be 23.3%, in another study by Malik et al.[16] Apart from other factors, PDPH is related to the types of spinal needle used as well as size of the spinal needle.[17] The use of thinner Quincke type spinal needles progressively reduced the incidence as well as severity of PDPH.[18,19] Pencil point needles are considered to produce less damage to the dural fibers by splitting them instead of cutting and allow the hole to close more rapidly. Thus they have a lower incidence of post dural puncture headache as compared with cutting needle tip designs.[20] In the present study, PDPH rate with 27G Quincke needle was 3.2% and with 25G Quincke needle, it was 14.5%. Therefore, current study clearly demonstrated a significant reduction in frequency of PDPH when 27G Quincke spinal needle was used as compared to 25G Quincke spinal needles (p = 0.27). Our results can be compared with the study of Shaikh et al.[13] and Malik et al.[16] as the incidence of PDPH in our setting is similar to these studies. Our study is limited by the small sample size.

CONCLUSION

We conclude that 27G Quincke spinal needle has significant advantage over 25G Quincke spinal needles in terms of frequency and severity of PDPH when used for spinal anesthesia for cesarean sections.

Conflict of interest: None declared by the authors

Author contribution: All authors equally contributed in conduct of study and manuscript preparation.

REFERENCES

1. Yeoh SB, Leong SB, Heng AST. Anaesthesia for lower-segment caesarean section: Changing perspectives. Indian J Anaesth. 2010 Sep;54(5):409–14. doi: 10.4103/0019-5049.71037.
   [PubMed] [Free full text]
2. Naghibi K, Saryazdi H, Kashefi P, Rohani F. The comparison of spinal anesthesia with general anesthesia on the postoperative pain scores and analgesic requirements after elective lower abdominal surgery: a randomized, double-blinded study. J Res Med Sci. 2013 Jul;18(7):543-8.
   [PubMed] [Free full text]
3. Ghaleb A, Khorasani A, Mangar D. Postdural puncture headache. Int J Gen Med 2012;5:45-51. doi: 10.2147/IJGM.S17834
   [PubMed] [Free full text]
4. Beigh Z, Ommid M, Gupta AK, Akhoon S, Qazi S. Post dural puncture headache in ceasarean sections: A study with 25 gauze quincke needle. Pravara Med Rev 2011;3: 11-5.
5. Jabbari A, Alijanpour E, Mir M, Bani Hashem N, Rabiea SM, Rupani MA. Post spinal puncture headache, an old problem and new concepts: review of articles about predisposing factors. Caspian J Intern Med. 2013 Winter;4(1):595-602.
   [PubMed] [Free full text]
6. Zeger W, Younggren B, Smith L. Comparison of cosyntropin versus caffeine for post-dural puncture headaches: a randomized double-blind trial. World J Emerg Med. 2012;3(3):182–5. doi: 10.5847/wjem.j.1920-8642.2012.03.004
   [PubMed] [Free full text]
7. Krueger JE, Stoelting VK, Graf JP. Etiology and treatment of post-spinal headaches. Anaesthesiolgy. 1951 Jul;12(4):477-85.
   [PubMed]
8. Linard C, Bierlaire D, Mangin JC, Fusciardi J, Mercier C, Laffon M. Spinal anaesthesia in cesarean section and success rates: 25G vs 26G vs 27G needles: A-683. European journal of anaesthesiology 2006;23:177.
9. Landau R, Ciliberto CF, Goodman SR, Kim-Lo SH, Smiley RM. Complications with 25-gauge and 27-gauge Whitacre needles during combined spinal-epidural analgesia in labor. Int J Obstet Anesth. 2001 Jul;10(3):168-71.
   [PubMed]
10. Santanen U, Rautoma P, Luurila H, Erkola O, Pere P. Comparison of 27-gauge (0.41-mm) Whitacre and Quincke spinal needles with respect to post-dural puncture headache and non-dural puncture headache. Acta Anaesthesiol Scand. 2004 Apr;48(4):474-9.
    [PubMed]
11. Wadood R. Tariq A. Post dural puncture headache, comparison of 25 and 27G spinal needles in urological patients. Khyber J Med Sci 2014;7:40-3.
    [PubMed] [Free full text]
12. Wadood R, Laiq N, Qureshi FA, Jan AS. The frequency of post dural puncture headaches in different age groups. J Coll Physicians Surg Pak. 2006 Jun;16(6):389–92.
    [PubMed]
13. Shaikh JM, Memon A, Memon MA, Khan M. Post dural puncture headache after spinal anaesthesia for caesarean section: a comparison of 25g Quincke, 27g Quincke and 27g Whitacre spinal needles. J Ayub Med Coll Abbottabad. 2008 Jul-Sep;20(3):10-13.
    [PubMed]
14. Muhammad SK, Ghulam NM, Safia MS, Maqsood AS. Post dural puncture headache in obstetrics: a comparative study using 25G Whitacre & 27G Quincke needles. Med Channel 2007;13:45–8.
15. Vitanen H, Porthan L, Vitanen M, Heula AL, Heikkila M. Postpartum neurologic symptoms following single-shot spinal block for labour analgesia. Acta Anaesthesiol Scand. 2005 Aug;49(7):1015-22.
    [PubMed]
16. Malik MA, Farooqi WS, Khan BH, Ishaq M. to compare the frequency and severity of post-dural puncture headache (PDPH) in parturients given spinal anaesthesia with 25G Quinche with that of 25G Whitacre needle. Pak J Med Health Sci 2012;6:90-3.
17. Halpern S, Preston R. Post dural puncture headache and spinal needle design. Metaanalysis. Anesthesiology. 1994 Dec;81(6):1376-83.
    [PubMed]
18. 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 Feb;44(2):147–9.
    [PubMed] [Free full text]
19. Lambert DH, Herley RJ, Hertwig L, Datta S. Role of needle gauge and tip configuration in the production of lumbar puncture headache. Reg Anesth. 1997 Jan-Feb;22(1):66–72.
    [PubMed]
20. Lybecker H, Moller JT , Nielsen HK. Incidence and prediction of post dural puncture headache: a prospective study of 1021 spinal anaesthsias. Anesth Analg. 1990 Apr;70(4):389-94.
    [PubMed]