

Post-dural Puncture Headache After Spinal Anaesthesia for Caesarean Section

Ali Sarfraz Siddiqui, Bushra Salim, Nigar Hashemy, Safia Zafar Siddiqui

ABSTRACT

Objective To find out the frequency and severity of post-dural puncture headache (PDPH) after spinal anaesthesia for caesarean section using 25G Quincke spinal needle.

Study design Descriptive case series.

Place & Duration of study Department of Anaesthesiology, Surgical Intensive Care & Pain Management, Civil Hospital Karachi, Dow University of Health Sciences Karachi, from July 2010 to June 2011.

Methodology Pregnant women, aged 18 to 40 year, ASA I and II, presenting for elective or emergency caesarean deliveries under spinal anaesthesia were included. Spinal anaesthesia was performed with standardized technique using 25G Quincke spinal needle. Patients were followed for three consecutive days postoperatively for the frequency and severity of post-dural puncture headache.

Results Out of four hundred and fifty parturient, 337 underwent emergency operations while 113 operated electively. In more than 93% cases spinal anaesthesia was instituted in first attempt. Thirty nine out of 450 patients (8.7%) developed post-dural puncture headache after spinal anaesthesia for caesarean section with 25G Quincke spinal needle. Thirty one had mild headache while eight parturient developed moderate headache.

Conclusion The frequency of post-dural puncture headache was in conformity to what has been reported in literature using 25G Quincke spinal needle.

Key words Post-dural puncture headache, Caesarean section, Quincke spinal needle.

INTRODUCTION:

Post-dural puncture headache is a significant and well known complication of spinal anaesthesia. Many factors like age, sex, pregnancy, spinal needle size, shape and orientation and number of attempts influence the occurrence of PDPH. It is 8.7% with 25-gauge Quincke cutting needle while 3.1% with 25-gauge Whitacre (pencil point) spinal needle.¹

Typically headache is bilateral, frontal or retro orbital, occipital and extending into the neck.² It may be throbbing or constant. The headache is postural in nature which is the hallmark of PDPH. Ninety percent

of headaches occur within three days of the procedure and may last up to a week. Other symptoms associated with PDPH include nausea, vomiting, hearing loss, tinnitus and blurred vision.³ Over 85% of post-dural puncture headaches resolve within six weeks.

Spinal needles fall into two main categories those that can cut the dural fibers and those designed to separate dural fibres. Cutting type spinal needles sharply create a puncture hole and a perforation channel through duramater causing cerebro-spinal fluid (CSF) leak and therefore risk of PDPH. The normal standard Quincke needle has a sharp point with a medium-length cutting bevel, resulting in a high frequency of PDPH.⁴ This study was conducted to observe the frequency and severity of post-dural puncture headache after spinal anaesthesia for caesarean section using 25G Quincke cutting spinal needle.

Correspondence:

Dr. Ali Sarfraz Siddiqui
Department of Anaesthesiology, Surgical Intensive Care & Pain Management, Civil Hospital & Dow University of Health Sciences Karachi
E-mail dr.alisarfraz@gmail.com

METHODOLOGY:

This descriptive study was conducted at the Department of Anaesthesiology, Surgical Intensive Care & Pain Management, Civil Hospital Karachi, Dow University of Health Sciences Karachi, from July 2010 to June 2011. After approval from hospital ethics committee and informed written consent, four hundred and fifty, ASA physical status I and II parturient, aged 18 to 40 year, weighing 50-90 kg, having healthy, single and alive fetus presenting for elective or emergency caesarean deliveries under spinal anaesthesia, were included. Women suffering from psychosis, dementia, with physiological or emotional instability, severe hypertension, hypovolemia, coagulopathy, sepsis, raised intracranial pressure, infection at the site of puncture and abnormality of vertebral column, were excluded.

All elective patients fasted for 6 to 8 hours prior to anaesthesia and all patients received aspiration prophylaxis preoperatively with intravenous ranitidine 50mg, metoclopramide 10mg and oral sodium citrate 30ml solution. In the operating room all patients were placed supine with left uterine displacement and standard monitoring was used including non invasive blood pressure recording, ECG and oxygen saturation tracing using pulse oximeter.

After application of monitors and maintaining two intravenous lines, all patients were preloaded with 10 ml/kg Lactated Ringer's solution over 10 minutes then infusion rate was reduced to maintenance rate and parturient placed in the sitting position. All aseptic measures were taken, and local infiltration with 2% lidocaine was done at the puncture site (L₃₋₄ interspace). Midline insertion at 90° with 25G Quincke cutting spinal needle was done. The bevel was directed parallel to meningeal fibers. Any backward movement of spinal needle followed by re-direction with separate skin puncture was regarded as further attempt. After confirming the free flow of CSF, 2ml of 0.5% hyperbaric bupivacaine with 20µg fentanyl was injected intra-theccally. Patients were then immediately placed in supine position with 15 degree left lateral tilt using wedge under right buttock. All patients were given supplemental oxygen at 5 liters/minute via face mask.

After about five minutes, level of block (sympathetic, sensory, motor) was assessed; sympathetic by temperature, sensory block with pinprick (T₁₀ up to umbilicus; T₆ up to xiphoid; T₄ up to nipple) and motor using modified Bromage scale (0 = No motor block; 1 = inability to flex hip; 2 = inability to flex knee; 3 = inability to flex ankle). Sensory block to T5 level was considered appropriate for surgery. After

confirming the level of block to T5 by pinprick method, surgeons were asked to proceed for surgery.

All patients were instructed to stay in bed for six hours after surgery or until motor power in both lower limbs returned to normal. All patients were assessed daily for three consecutive days for PDPH, its onset and severity. Patients who develop PDPH were advised to remain admitted and offered conservative treatment (rest, hydration and analgesics) and followed till they became symptom free.

PDPH was defined as headache aggravated by upright position, coughing or straining and relieved or reduced by lying flat; otherwise headache was regarded as non-post-dural puncture headache (NPDPH). Severity of PDPH was graded as mild (No limitation of activity, no medicine required), moderate (Limited activity, rest, hydration and regular analgesics required) and severe (Confined to bed, anorexic, unable to feed baby).⁵ At discharge all patients were advised to contact or visit hospital if they develop PDPH later.

All statistical analyses were performed using statistical packages for social sciences version 19 (SPSS Inc., Chicago, IL). Frequency and percentage were used to summarize frequency of PDPH and other categorical variables while mean and standard deviation were calculated for numeric variables like age, weight, height and duration of PDPH.

RESULTS:

Four hundred and fifty parturient having healthy, single and alive fetus presenting for elective or emergency caesarean deliveries under spinal anaesthesia were included in this study. Demographic characteristics of patients, history of spinal anaesthesia, headache and number of insertion attempts are presented in table I. Three hundred and thirty seven parturient underwent emergency caesarean deliveries while one hundred and thirteen were operated electively. In more than 93% cases spinal anaesthesia was used in first attempt.

Thirty nine out of 450 patients (8.7%) developed post-dural puncture headache after spinal anaesthesia. Among the thirty nine parturient who developed PDPH, thirty five underwent emergency caesarean section. One hundred and eighty four parturient had history of previous spinal anaesthesia and among them only sixteen developed PDPH. Five parturient had history of PDPH in previous caesarean deliveries; among them only one developed headache. Relation of insertion

Table I: Characteristics of Patients (n=450)	
Variables	Statistics
Age (year)	26.24±4.55 (Range: 40-18)
Weight (kg)	64.08±7.62 (Range: 85-45)
Height (cm)	161.02±6.59 (Range: 170-150)
ASA Physical status: n (%)	
v I	416 (92.4%)
v II	34 (7.6%)
Previous spinal anaesthesia; n (%)	184 (40.9%)
History of headache (PDPH)	5 (1.1%)
No. of attempts; n (%)	
Ø One	420 (93.3%)
Ø Two	27 (6%)
Ø Three	3 (0.7%)

ASA: American Society of Anaesthesiologist

Table II: Characteristics of PDPH Patients (n=39/450)	
Variables	Statistics
Type of Surgery; n (%)	
• Elective	4/113 (3.5%)
• Emergency	35/337 (10.4%)
Previous Spinal Anaesthesia; n (%)	16/184 (8.7%)
History of headache	1/5 (20%)
No. of attempts; n (%)	
Ø One	35/420 (8.3%)
Ø Two	3/27 (11.1%)
Ø Three	1/3 (33.3%)

attempts and development of PDPH is shown in table II.

Thirty four out of thirty nine parturient developed headache in first 48 hours after caesarean deliveries. Out of thirty nine parturient who developed post-dural puncture headache; thirty one had mild headache while eight parturient developed moderate headache. All parturient responded to conservative treatment.

DISCUSSION:

Headache during post-partum period can occur due to various causes. Many parturient have primary

headache that gets aggravated due to maternal fatigue, stress, fluid shifts, weight changes and estrogen-withdrawal. This may have postural features. Significant risk factors include inadvertent dural puncture, previous history of headache, multiparity and increased maternal age.⁶ General anaesthesia for caesarean deliveries is associated with a number of complications.⁷ Regional anaesthesia is therefore is preferable choice though it may be associated with post-dural puncture headache.⁸

PDPH occurs due to leakage of CSF from the

dural puncture. The signs and symptoms are due to loss of cerebrospinal fluid, traction on the cranial contents and meninges and reflex cerebral vasodilation.⁹ Clinical features range from mild headache with no limitation of activity to very severe and distressing headache. Many factors influence the frequency of PDPH.¹⁰⁻¹³ The frequency of dural puncture in obstetrics practice in UK is 0.18 - 3.6%. Eighty percent of these patients suffer from PDPH. The frequency of this is expected to be less than 1% in teaching hospitals.¹⁴ The frequency of disabling headache after dural puncture in spinal anaesthesia ranges from 0.3 to 20%. The headache is self-limiting and 88% resolve with simple measure without intervention.¹⁵

In this study 25 G Quincke needle was used for spinal anaesthesia. The frequency of PDPH was 8.7%. Shah et al reported 20 % frequency of PDPH using 25 gauge Quincke spinal needle. Onset of headache was mostly on second and third day postoperatively, mild in intensity and of less than 48 hours duration.¹⁶ In this study the onset of headache in most of the patients was within 48 hours postoperatively and intensity of headache was mild.

The Summary report of the UK National Obstetric Anaesthetic Database quoted frequency of 1.1% to 1.9% of PDPH between all anaesthetic techniques but this increased to 11% for women receiving multiple regional anaesthetics. The predominant characteristics of PDPH were limitation of daily activity and a postural element while shoulder/neck stiffness was the commonest symptom associated with PDPH.¹⁷

Viitanen et al reported 8.5% frequency of PDPH with 27-gauge Quincke-type needle with 4% patients developed mild symptoms, 3% moderate and only 1% had severe headache.¹⁸ In another study by Zafarullah et al 151 obstetric patients coming for caesarean section using 25G Quincke cutting spinal needle reported 14% frequency of PDPH with seven mild, ten moderate, three severe and one very severe case of headache.¹⁹ Parmar et al using 27G Quincke spinal needle in spinal anaesthesia for caesarean section reported 2% frequency of headache that was mild in intensity.²⁰ In a study by Sheikh et al frequency of PDPH was 8.3% with 25G Quincke needle, 3.7% with 27G Quincke needle and 2.0% with 27G Whitacre needle.²¹

In a recent review article regarding postpartum headache it has been highlighted that parturient with strong history of migraine may have severe headache in postpartum period because of abrupt

decrease of estrogen. So diagnosis of PDPH should be made with special considerations. The reported incidence of PDPH ranged from 1–16%.²² In this study parturient who underwent emergency caesarean deliveries had high frequency of PDPH (10.4%) as compared to those who had elective caesarean deliveries (3.5%). This may be explained by considering parturient under more stress, dehydration, hypovolemia and less expertise of junior anaesthetists during odd hours.

CONCLUSIONS:

The frequency of post-dural puncture headache after spinal anaesthesia for caesarean section with 25G Quincke spinal needle was 8.7%. Out of 39 parturient who developed PDPH most had mild headache.

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