RESEARCH ARTICLE

# 27G QUINCKE SPINAL NEEDLE FOR SPINAL ANAESTHESIA IN CAESAREAN SECTION: A STUDY OF 50 CASES

**Siddharthkumar Parmar, Abdul Nasir Sheikh, Prerana Mankad**
BJ Medical College, Ahmedabad, Gujarat, India

**Correspondence to: Siddharthkumar Parmar (drsid25@gmail.com)**

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## ABSTRACT

**Background:** Post dural puncture headache (PDPH) is a serious complication of spinal anaesthesia and incidence is more particularly in parturient.

**Aims & Objective:** The present study was designed to investigate the use of 27 Gauge (G) spinal needle for spinal anaesthesia in Caesarean section in terms of success and PDPH rate.

**Material and Methods:** We included total 50 female patients of aged 20-40 years old, were administered spinal anaesthesia with 27G Quincke spinal needle for Caesarean section by same investigator having enough experience. Redirections and attempts for lumbar puncture, success rates of spinal anaesthesia and PDPH were recorded.

**Results:** We succeeded in 49 patients (98%) to administer spinal anaesthesia. The mean attempt and redirections for lumbar puncture were 1.1 and 1.24 respectively. We found PDPH in 1 patient (2%), which was mild in severity and subsided within two days.

**Conclusion:** Spinal anaesthesia using a 27G Quincke spinal needle, in experienced hands can have successful spinal block with reduced PDPH rates in patients undergoing Caesarean section.

**Key-Words:** Spinal Anaesthesia; 27G Quincke Spinal Needle; Post Dural Puncture Headache; Caesarean Section

## Introduction

Spinal anaesthesia is a safe and widely practiced anaesthetic technique in Caesarean section. Despite of all advantages, spinal anaesthesia is not without complications. Post dural puncture headache (PDPH) is a serious complication of spinal anaesthesia and incidence is more particularly in parturient.[1,2] After introduction of thinner spinal needle, the incidence of PDPH is grossly reduced.[3-6]

The present study was designed to investigate the use of 27 Gauge (G) spinal needle for spinal anaesthesia in Caesarean section in terms of success and PDPH rate.

## Materials and Methods

This prospective, randomized clinical study was conducted in tertiary care hospital and teaching medical college of Gujarat, India. Approval of ethical committee and patient's consent were obtained. We included 50, female patients of aged 20-40 years old, undergoing Caesarean section. American society of Anaesthesiologist physical status I-III, a pregnancy of at least 32 weeks gestation with a single uncompromised fetus and uncomplicated pregnancy were mandatory inclusion criteria. Patients with severe pregnancy induced hypertension, hypovolaemia, obese, infection on back, cardiac or respiratory disease and vertebral anomaly were excluded.

All patients fasted for at least 6 hours. On arrival in the operation theatre, patients were positioned supine with left lateral displacement of 20 degree by putting a wedge under the right hip. A 3 lead ECG, pulse oximetry and an automated non-invasive blood pressure monitor were applied. All patients were premedicated with injection ranitidine 50 mg and ondansetron 4 mg intravenously. Patients were co-loaded with 500 ml Ringer lactate solution via 18G intravenous cannula. Spinal anaesthesia was performed with the patient in sitting position after skin disinfection with Povidone Iodine and alcohol. Lumber puncture was done using a midline approach at the L2-3 or L3-4 interspace using 27G spinal needle and 0.5% hyperbaric bupivacaine 2.0 to 2.2 ml was injected over 20-30 seconds after getting free and clear flow of CSF from spinal needle. During lumbar puncture, bevel of spinal needle was kept parallel to the sagittal plane to

prevent cutting of the dural fibres. Patients were then positioned supine with the wedge under the right hip. A sensory level T4 was achieved. All patients received oxygen 4 litre/min via a facemask. All patients were monitored for heart rate, SPO2 and blood pressure continuously during surgery and managed accordingly. Redirections and attempts for lumbar puncture, successful spinal anaesthesia and PDPH were recorded for all patients.

An attempt for lumbar puncture was defined as separate skin puncture with spinal needle for lumbar puncture. Successful spinal anaesthesia was defined as achievement of sensory T4 level. PDPH was defined as occipital, frontal or generalized headache, aggravated by erect or sitting position and coughing, sneezing, straining; relieved by lying flat. Severity of PDPH[7,18] was graded as per table 1.

More than 2 attempts for lumbar puncture and fail to achieve a sensory T4 level were treated as failure and general anaesthesia was provided for Caesarean section. PDPH, when present was treated with bed rest, adequate hydration and analgesics.

**Table-1: Grades of PDPH Severity**

| Severity of PDPH | Features |
|---|---|
| Mild | No limitation of activity.<br>No treatment required. |
| Moderate | Limited activity.<br>Regular analgesics required. |
| Severe | Confined to bed.<br>Anorexic.<br>Unable to feed baby. |

## Results

We succeeded in 49 out of 50 patients (98%) to administer spinal anaesthesia in Caesarean section.

**Table-2: Demographics of the Study**

| Parameters | | N |
|---|---|---|
| Age (mean ± SD) | | 26.1 ± 4.4 |
| Parity | Primipara | 13 (26%) |
| | Multipara | 37 (74%) |
| Physical Status | ASA I | 11 (22%) |
| | ASA II | 39 (78%) |

The mean attempt for lumbar puncture was 1.1 (55 in 50 patients). The mean redirection for lumbar puncture was 1.24 (62 in 50 patients). We found PDPH in 1 out of 50 patients (2%) in present study. Severity of PDPH was mild and subsided within two days. It did not require any active interventions.

**Table-3: Frequency of Parameters**

| Parameters | No | Mean or % |
|---|---|---|
| Redirections for lumbar puncture | 62/50 | 1.24 |
| Attempts for lumbar puncture | 55/50 | 1.1 |
| Successful spinal anaesthesia | 49/50 | 98% |
| PDPH | 1/50 | 2% |

**Table-4: Severity of PDPH**

| PDPH | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 |
|---|---|---|---|---|---|
| Mild | 1 | 1 | 0 | 0 | 0 |
| Moderate | 0 | 0 | 0 | 0 | 0 |
| Severe | 0 | 0 | 0 | 0 | 0 |

## Discussion

PDPH is believed to result from leakage of CSF. The clinical features of PDPH result from loss of cerebrospinal fluid, traction on the cranial contents, and reflex cerebral vasodilation.[8] Incidence of PDPH are more in female especially in parturient. Many factors influence the incidence of PDPH including needle size, needle tip design, age, gender, pregnancy, bevel orientation to Dura, attempts of lumbar puncture and clinical experience of operator.[9-14]

In present study, we found 98% success rate of spinal anaesthesia with 27G spinal needle in Caesarean section. However, it was associated with 1.24 average redirections and 1.1 average attempts for lumbar puncture. One patient had mild PDPH which remained for two days. It did not require any active interventions.

In present study, all lumbar punctures were performed by same investigator who has 12 years of experience in clinical anaesthetic practice to avoid the experience related bias. We enrolled female patients undergoing Caesarean section because incidence of PDPH was higher among them. During lumbar puncture, bevel of spinal needle was kept parallel to the sagittal plane to prevent cutting of the dural fibres. Adequate hydration was ensured to all patients for postoperatively.

Ranju Singh et al[15] evaluated incidence of PDPH with 23G spinal Quincke needle in patients undergoing an emergency caesarean section in their study. They found that 34 patients out of 730

patients had typical PDPH, giving an incidence of 4.7%. PDPH was statistically significantly associated with number of attempts, experience of anaesthetist, position of patients or a traumatic lumbar puncture.

N Ratan Singh and H Shanti Singh[16] found 3% PDPH rate in their study in 100 female patients undergoing lower abdominal surgery under spinal anaesthesia using 25G Quincke needle. PDPH appeared mainly on 1st postoperative day and was associated with nausea and vomiting in one case and it disappeared by the 2nd and 3rd day following administration of mild analgesics and anti-emetics.

Many comparative studies[3-6,17,18] concluded that thinner spinal needle for spinal anaesthesia for Caesarean section is associated with low incidence of PDPH. But, few studies[6,17] reported low PDPH rate with high failure rate of spinal anaesthesia with 27G compared to 25G needle in Caesarean section.

PDPH is a distressing condition if severe and long lasting, it can lead to morbidity and mortality. Authors believe that 27G spinal needle for Caesarean section in experienced hands can reduce PDPH rates.

## Conclusion

Spinal anaesthesia using a 27G Quincke spinal needle, in experienced hands, can have successful spinal block with reduced PDPH rates in patients undergoing Caesarean section.

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