

## Study of incidence of postdural puncture headache (pdph) in pregnant women with different body mass index undergoing caesarean section under spinal anaesthesia

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### Abstract

**Introduction:** Postdural puncture headache is commonly experienced by parturients especially after caesarean delivery under spinal anaesthesia. The objective of our study was to study the incidence of PDPH in pregnant women with low and high body mass index.

**Methods:** Our study comprised of Group A and Group B of 30 patients each with BMI < 30kg/m<sup>2</sup> and > 30kg/m<sup>2</sup> respectively undergoing elective caesarean section under spinal anaesthesia.

**Results:** The study was a prospective randomized study in which incidence of PDPH was higher in patients with low body mass index compared to those with high body mass index.

**Conclusion:** Incidence of PDPH was higher in patients with low body mass index compared to high body mass index and the difference was statistically significant.

**Keywords:** Postdural puncture headache, Caesarean, Body mass index, Spinal.

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### Introduction

Postdural puncture headache is an important iatrogenic cause of patient morbidity in modern anaesthesia, especially after spinal anaesthesia. The incidence of PDPH ranges from 0.16% - 1.3% in experienced hands.<sup>1</sup>

Any breach in the duramater can result in PDPH. A breach can be spontaneous or iatrogenic.<sup>2</sup> Dural puncture resulting while performing spinal or epidural anaesthesia can produce PDPH. PDPH may result immediately or as long as 48 hours post procedure.<sup>3</sup>

Spinal anaesthesia is commonly performed and desirable form of anaesthesia for caesarean section as it is easy to perform, provides good surgical relaxation, faster onset of action with very good maternal and foetal outcome. As PDPH is commonly encountered in parturients after caesarean section, we decided to study incidence of PDPH in patients undergoing caesarean section with different body mass index i.e. thin and obese patients. As anecdotal experience and limited publications suggest that an inverse relationship between body mass index (BMI) and postdural puncture headache may exist we decided to study incidence of PDPH in parturients undergoing caesarean section with low and high BMI with the objective that the study will help to anticipate incidence of PDPH in

parturients better, and also take proper preventive measures to reduce the incidence. The association of predisposing factors like female, young age, pregnancy, low body mass index, multiple dural puncture expose the patient to PDPH. The identification of risk factors that predict the likelihood of PDPH is important, and as body mass index is one of the factor, this study is important so that measures can be taken to minimize this painful complication resulting from spinal anaesthesia. If the study is not done we would not be able to correlate incidence of PDPH and body mass index and the subsequent measures to reduce the incidence of PDPH.

### Materials and Methods

The study was a prospective study conducted in Obstetric operation theatre of our institute. It comprised 60 female patients posted for lower segment caesarean section of ASA grade I and grade II. The patients were evaluated preoperatively. Patients were explained about the procedure of spinal anaesthesia. The study was approved by the ethical committee and written informed valid consent was taken from all the patients. Patients Body Mass Index was calculated preoperatively.

#### Inclusion Criteria

- Patients undergoing elective lower segment caesarean section.
- ASA I & II.
- Patients willing for spinal anaesthesia.

#### Exclusion Criteria

- Patient refusal.
- Patients who had contraindications for spinal anaesthesia.

- Patients with pre-eclampsia, eclampsia, or other comorbid conditions.

Baseline pulse, BP, SPO<sub>2</sub> were recorded. Intravenous access with 20 G cannula was established. Preloading with 500 ml of Ringers Lactate was done.

Under all aseptic precautions subarachnoid block was performed with 25 G Quincke spinal needle in L3 – L4 interspace with 2 – 2.2 ml of 0.5% of hyperbaric bupivacaine. All blocks were performed by the 4 anaesthesiologist and group of anaesthesia residents under supervision of attending anaesthesiologist. All blocks were performed with bevel of the needle oriented parallel to the longitudinal dural fibres. Maximum 3 attempts for dural punctures were made and those patients requiring more than 3 attempts were not included in the study to avoid bias in results due to multiple attempts.

The surgical procedure was completed uneventfully.

Postoperatively the patients were monitored and asked to report if they experienced any headache. Postdural puncture headache is characteristically located in the frontal and or the occipital region, aggravated by the upright position and relieved by recumbency.

Patients were divided in two groups; patients with BMI <30 into group A and BMI >30 into group B. Patients were asked to report if they experienced headache which worsened within 15 minutes after assuming the upright position and improves after less than 30 minutes in the recumbent position. PDPH was assessed by a visual analogue scale (VAS) from 0 to 10. Patients were divided into two groups, those who had no PDPH (zero scale) and others who had PDPH symptoms (VAS scores 1-10).

Severity of PDPH was assessed using a visual analogue scale (VAS 1-10); 0= no headache, 1-3 = mild headache, 4-7=moderate headache, > 7= severe headache. If patients complained about PDPH, anaesthesia consultation was performed and individual treatments including partial rest, hydration, caffeine,

Acetaminophen or advised to regular consumption of tea or coffee in cases of mild to moderate PDPH. As there was no incidence of severe PDPH, there was no

need to perform invasive measures like epidural blood patch.

### Statistical Methods

Descriptive statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean+ SD and results on categorical measurement are presented in number(%). Significance is assessed at 5% level of significance. Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups. P value < 0.05 was considered statistically significant.

### Results

In our study totally 60 patients of ASA grade I and II were undergone spinal anaesthesia for lower segment caesarean section.

All patients were between 18 to 35 years age group.

In our study in group A total 7 patients out of 30 patients experienced PDPH i.e.23%. The difference between the two groups was statistically significant. Study performed by Cesarini et al, a randomized trial of 24 gauge sprotte and 25 gauge quincke needle in patients receiving spinal anaesthesia for caesarean section, there were no cases of PDPH in sprotte group but there was 14.5% incidence of PDPH in the quincke group which correlated with the incidence of PDPH in our study.

The severity of PDPH was assessed based on Visual Analogue Scale. Out of 7 patients in group A 5 patients experienced mild PDPH pain (VAS 1- 3) and 2 patients complained of moderate PDPH (VAS 4- 7) (Table 3).

None of the patients complained of severe PDPH.

In group B only 3 patients out of 30 patients complained of PDPH i.e. 10%.(Table 2).

Out of these 3 patients 2 patients complained of mild PDPH (VAS1- 3) and 1 patient complained of moderate PDPH (VAS 4- 7). (Table 3). The headache subsided on its own with conservative management. None of the patients in our study complained of severe PDPH and no patient required interventional treatment like epidural blood patch.

**Table 1: Demographic Data of the Study Group**

Data	Group A	Group B
Number of Patients	30	30
Weight(Mean+Sd)	60.46 +/- 5.25	78.8 +/-5.16
Height(In Cm) (Mean +/- Sd)	156.4 +/- 6.68	154.8 +/- 4.55
BMI	24.716	33.175

Ns: Not Significant By Student To Test.

P<0.05: Significant

**Table 2: Comparison of Incidence of PDPH in Group A & B**

No of patients experiencing PDPH			
Group A	7	23%	P Value: 0.0036
Group B	3	3%	P Value: 0.0036

P<0.05 – Significant  
(Significant By Students Unpaired T-Test)

**Table 3: Visual Analogue Score in Study Group**

Visual Analogue Score		
Number of Patients	Group A	Group B
1-3 (Mild)	5	2
4-7 (Moderate)	2	1
7-12 (Severe)	0	0

### Discussion

The present study comprised of 60 patients of ASA class I or II undergoing lower segment caesarean section.

Patients with BMI < 30 were assigned to group A and those with BMI > 30 were assigned to group B. The mean weight of patients in group A was 60.46 kgs and mean weight of patients in group B was 78.68 kgs.

Mean BMI of patients in group A was 24.716 kg/m<sup>2</sup> and in group B was 33.175 kg/m<sup>2</sup>.(Table 1)

In our study the incidence of PDPH in group A was 23% and in group B it was 3%. The difference between the two groups in our study was statistically significant.(p value 0.0036 i.e. p < 0.05).(Table 2)

The results of our study correlated with the study conducted by Peralta F et al in which incidence of PDPH in parturients with BMI > 31.5 kg/m<sup>2</sup> (39%) was lower than in parturients with BMI < 31.5 kg/m<sup>2</sup>(56%).<sup>4</sup>

Our study did not correlate with the study conducted by Miu et al, according to which there was no statistically significant difference in incidence of PDPH in BMI < 30 and BMI > 30 kg/m<sup>2</sup> groups.<sup>5</sup>

In our study total 10 patients out of 60 experienced PDPH (16.6% 0 out of which 7 were in group A and 3 in group B. PDPH experienced was mild to moderate in intensity (VAS < 3- mild, 3-6 moderate). None of the patients complained of severe PDPH. Cesarini et al in his study, a randomized trial of 24G sprotte and 25G quincke needle in patients receiving spinal anaesthesia for caesarean section, there was no incidence of PDPH in sprotte group but there was 14.5% incidence of PDPH in quincke group which closely correlates with the incidence of PDPH in our study i.e. 16.6%.<sup>8</sup>

Thus in our study incidence of PDPH was lower in patients with BMI > 30 compared to BMI <30.The decreased incidence can be explained by the fact that in obese or morbidly obese women increase in intra-abdominal pressure acts as an abdominal binder helping to seal the defect in duramater and decreasing the loss of CSF<sup>6</sup>.

### Conclusion

Thus from our study we conclude that women with high BMI (> 30) undergoing caesarean section under spinal anaesthesia have a lower incidence of PDPH when compared to those with lower BMI.

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