Clinical Communication

Post dural puncture backache in parturients undergoing caesarean delivery under spinal anaesthesia

INTRODUCTION

Post dural puncture backache (PDPB) is a cause of morbidity after spinal anaesthesia.[1] We investigated the incidence and the risk factors associated with PDPB in women undergoing caesarean delivery (CD).

METHODS

This study is a secondary outcome analysis of a randomised, double-blind study investigating post dural puncture headache (PDPH) in 870 term parturients undergoing elective or emergency CD under spinal anaesthesia.[2] The study was approved by the Institute Ethics Committee and registered with Clinical Trials Registry-India (CTRI/2017/12/010828). Written informed patient consent was obtained. Exclusion criteria were severe pregnancy-induced hypertension (PIH) and eclampsia, haemodynamic instability, raised intracranial pressure, coagulopathy, chronic use of analgesics or any other contraindication to spinal anaesthesia. Patients with previous history of backache were also excluded.

Subarachnoid block was performed with 1.8–2 ml of heavy bupivacaine 0.5% with fentanyl 10 μg (patient in sitting position, midline approach at the L3–L4 or L4–L5 inter-vertebral space using 25G Quincke needle). The number of attempts (skin punctures, needle passes and needle redirections) for successful dural puncture and provider experience was noted. Successful identification of the subarachnoid space with one skin puncture and no redirection of the spinal needle was considered as first pass success. Postoperatively, paracetamol 1g IV 8-hourly was given for analgesia. Diclofenac 50 mg intramuscularly 12-hourly was used to supplement analgesia, if required. The time to sitting and ambulation, postoperative analgesic consumption and perioperative fluid administered was recorded.

Patients were assessed for PDPB on days 1, 2 and 3 (personal visit) and on days 5 and 7 (telephone interview). PDPB was defined as continuous pain and tenderness over the lumbar area around the spinal needle insertion without any radiation.[3] The presence, onset, severity and duration of backache were recorded. Severity of PDPB was assessed by visual analogue scale (VAS 1-10) score; 0 = no backache, 1–3 = mild backache, 4–7 = moderate backache, >7 = severe backache. Factors associated with PDPB were analysed. Statistical analysis was performed by the Statistical Package for the Social Sciences(SPSS) program for Windows, version 17.0. A P value <0.05 was taken to indicate a significant difference.

RESULTS

The study included 870 patients. Since 23 patients had a previous history of backache, they were excluded from analysis. Therefore, PDPB was analysed from data of 847 patients. No patient with a previous history of backache reported any increase in the severity of backache following spinal anaesthesia.

Patient characteristics, co-morbidities, body habitus, quality of landmarks are described in Table 1. Spine flexion was adequate in all patients.

The incidence of PDPB was 1.7% (14/847 patients). The mean onset of backache was 11.1 ± 7.7 h. The mean VAS severity score of PDPB was 3.5 ± 0.5. The mean duration of backache was 4.6 ± 1.7 days. All patients responded to treatment with paracetamol and diclofenac.

Factors affecting the incidence of PDPB are tabulated in Table 2. The following factors did not affect the incidence of PDPB: age (P = 0.606), elective or emergency CD (P = 0.324) or parturient in labour (P = 0.709), previous spinal anaesthesia (P = 0.389), diabetes (P = 1.000), hypothyroidism (P = 1.000), body habitus (P = 0.125), bony deformity (P = 0.875), experience of the provider (P = 0.777), occurrence of paraesthesia (P = 1.000), contact of spinal needle with bone (P = 0.078), duration of surgery (P = 0.058), time to sitting (P = 0.346) and time to ambulation (P = 0.748), occurrence of PDPH (P = 0.628).

DISCUSSION

The incidence of PDPB was 1.7% in term patients following CD under spinal anaesthesia. The backache was mild to moderate in intensity, of short duration and responded to paracetamol and diclofenac by oral and/or intravenous route. PDPB was associated with body mass index (BMI), quality of spinal landmarks, number of skin punctures and spinal needle redirections, intervertebral space level change, need

for taking over by second anaesthesia provider, bloody cerebrospinal fluid, presence of PIH and intravenous fluid administered.

The incidence of PDPB in the literature ranges from 2% to 29% in adults.[4,5] The incidence of PDPB in patients undergoing CD under spinal anaesthesia with 25-gauge spinal needle was 5% in the first 24 h and 9.5% in the first week after spinal anaesthesia.[6] Another study reported a PDPB incidence of 10.83% in obstetric patients.[7] Patients with a lower BMI have been reported to experience a lower prevalence of backache.[8] Increased weight, increased BMI and poor quality of landmarks were associated with occurrence of PDPB in our study. Poor quality of landmarks results in multiple skin punctures, spinal needle redirections and needle passes. It also increases the need for taking over by a second provider or for change in intervertebral space level and increases first pass failure. In our study, increased number of skin punctures, needle redirections and needle passes, change in intervertebral space level, taking over by a second provider and first pass failure were associated with an increased incidence of PDPB. The number of spinal needle redirections required to obtain cerebrospinal fluid (CSF) is an estimate of the technical difficulty of the procedure. A significant association has been reported between backache and more than two needle insertions in women undergoing elective CD under spinal anaesthesia and was considered to be due to soft tissue or periosteal trauma.[9,10] We found that patients who had a traumatic tap (blood in CSF) experienced a higher incidence of backache compared to those who had clear CSF on dural puncture. This could be related to multiple attempts during spinal procedure.

A history of back pain, BMI ≥32 kg/m^2, lithotomy position, multiple attempts at block placement, duration of surgery >2.5 h are risk factors for development of back pain.[8] Younger age, high spinal anaesthesia, nausea, vomiting and post dural puncture headache increased PDPB in women undergoing CD.[6] In our study, the level of spinal block and PDPH did

Table 1: Patient characteristics, body habitus and quality of landmarks

Parameters	*n*=847
Age (yr)	25.3±4.3
Weight (kg)	58.9±7.0
Body mass index (kg/m^2)	24.7±2.7
Hypertension	9 (1.1)
Pregnancy-induced hypertension	125 (14.7)
Diabetes	26 (3.1)
Hypothyroidism	62 (7.3)
Elective/Emergency	169/678
Patients in labour	325 (38.4)
Duration of surgery (min)	57.5±7.2
Body habitus	
Normal	514 (60.7)
Thin	1 (0.1)
Muscular	0 (0)
Obese	28 (3.3)
Overweight	304 (35.9)
Quality of landmarks	
Good	839 (99.1)
Poor	8 (0.009)
None	0 (0)

Values are mean±standard deviation, numbers or numbers (%), as appropriate

Table 2: Factors affecting the incidence of post dural puncture backache

Factors	PDPB (*n*=14)	No PDPB (*n*=833)	Mean difference	95% CI	*P*
Weight	63.4±8.7	58.9±6.9	4.560	0.887-8.232	0.015
Body mass index	26.7±2.9	24.7±2.7	1.953	0.5324-3.374	0.007
PIH	5 (35.7)	122 (14.3)			0.041
Landmark quality					
Good	11 (78.6)	823 (96.1)			0.002
Poor	3 (21.4)	30 (3.5)			
None	0 (0)	3 (0.4)			
Skin punctures	2.4±1.7	1.1±0.4			0.016
Needle redirections	2.4±2.7	0.4±0.9			0.014
Needle passes	1.7±4.2	1.5±1.3			0.013
Space level change	2 (14.3)	12 (1.4)			0.020
First pass success	7 (50)	704 (82.2)			0.007
Second provider	3 (21.4)	15 (1.8)			0.002
Cerebrospinal fluid					
Bloody	3 (21.4)	38 (4.6)			0.000
Clear	11 (78.6)	795 (95.4)			
Intraoperative fluid (L)	1.7±0.3	2.0±0.2			0.002

Values are mean±standard deviation or number (%), as appropriate. PDPB, post dural puncture backache; CI, confidence interval; PIH, pregnancy-induced hypertension

not increase the incidence of PDPB. Other factors in our study that were not associated with PDPB were parturient in labour, body habitus, provider experience, occurrence of paraesthesia or contact of spinal needle with bone, intraoperative haemodynamic instability, quality of block, duration of surgery, time to sitting or time to ambulation.

There is indecisiveness amongst anaesthesiologists regarding performing neuraxial anaesthesia in patients with backache for fear of medicolegal implications or worsening of existing backache. Patients with a previous history of backache in our study did not report any change in intensity of backache after spinal anaesthesia. There is no worsening of pre-existing back pain after neuraxial anaesthesia.[8] The back pain has been attributed to tears in the ligaments, fascia or bone with localised bleeding, relaxation of the paraspinal muscles under anaesthesia, flattening of the normal lumbar convexity, immobility of the spine and stretching and straining of the lumbosacral ligaments and joint capsules.[5,8,11,12] It is imperative that serious complications such as epidural haematoma or abscess be ruled out. Our study has limitations. Quincke needle (25-gauge) was used in this study. Therefore, our results cannot be extrapolated to other needle types and sizes.

CONCLUSIONS

The incidence of PDPB was 1.7% in the obstetric population. The onset of backache was within 24 h of spinal anaesthesia and resolved within a week. Pain was of mild to moderate intensity and responded to treatment with paracetamol and diclofenac. Factors associated with PDPB included increased BMI, poor quality of spinal landmarks, increased number of attempts and spinal needle redirections and occurrence of bloody tap.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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