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Incidence of postdural puncture headache in patients undergoing cesarean section under spinal anaesthesia with 26g spinal needle

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Abstract

Objective: Post dural puncture headache (PDPH) is a preventable complication of spinal anaesthesia, hence this study was undertaken to know the incidence of PDPH.

Methodology: 670 patients belonging to ASA II with age group ranging from 20-35 years were considered for the study. Patients with acute or chronic headache, ophthalmic, otorhinolaryngological, psychiatric and neurological problems and those patients belonging to ASA III, IV were excluded from the study. Injection Bupivacaine H 0.5% was injected at L4-L5 intervertebral level using 26G Quinckes needle.

Results: In the postoperative period only 1.34% of cases developed PDPH. Five patients had mild headache, 3 patients had moderate headache and 1 patient had severe which was managed by analgesics like oral paracetamol, caffeine IV fluids and lying down position.

Conclusion: Multiple dural puncture attempts were associated with 17 times more risk of development of PDPH when compared to single attempt. The orientation of needle bevel perpendicular to the longitudinal dural fibres was associated with 4 times more risk of developing PDPH when compared to the parallel orientation.

Keywords: Parental attitude, participation, sports, girls

Introduction

Postdural puncture headache (PDPH) is a frequent iatrogenic complication of central neuraxial anaesthesia. It can occur following uncomplicated spinal anaesthesia and accidental dural puncture in epidural anaesthesia. The International Headache Society has defined PDPH as a bilateral headache that develops within 7 days after lumbar puncture and disappears within 14 days [1]. Spinal anaesthesia is the most commonly performed anaesthesia technique in patients undergoing caesarean section. Its preference is because of its advantages over general anaesthesia.

Postdural puncture headache is one of the complications which is more common in obstetric patients [2, 3]. Headache worsens within 15 minutes of assuming the upright position and disappears or improves within 30 minutes of resuming recumbent position [4]. PDPH is associated with anyone of the symptoms like neck stiffness, nausea, vomiting, tinnitus, photophobia and decreased hearing. Since the difference among the different types of needles is not statistically significant, the present study is done with the aim and objective of studying the incidence of PDPH in patients undergoing LSCS in our tertiary care maternity hospital, Lalla Ded Hospital (LD) in Srinagar, Kashmir.

Materials and methods

In this study 670 patients undergoing LSCS belonging to ASA-II with age ranging from 20-35 in LD hospital Srinagar were taken into consideration. Anaesthetic checkup was done prior to the surgery and patients with all other causes of headache, e.g., allergic rhinitis, ophthalmic and neurological problems, acute and chronic headaches were excluded from the study, in all the patients IV cannulation was done with 18G canula and coloadung with ringer lactate was done. With all aseptic precautions spinal anaesthesia was given with injection Bupivacaine H 0.5% 12.5mg at L4-L5 level. Minimal mandatory monitoring was done

Throughout the surgery. Heart rate and blood pressure were observed before spinal anaesthesia, every minute after spinal anaesthesia for first 15 minutes and then every 5 minutes thereafter till the end of surgery. ECG and oxygen saturation were also monitored throughout the surgery. Coloadng was done with IV fluids (RL) at the rate of 15 to 24ml/kg/h. Any fall in blood pressure below 20% of the baseline was treated with rapid administration of IV fluids and injection phenylephrine bolus 600µg followed by 100-300µg maintenance. Bradycardia associated with hypotension was treated with Injection Atropine 0.5mg i.v stat.

Results

In a period of 18 months, a total of 670 patients who underwent LSCS under spinal anaesthesia with 26G Quincke spinal needle were studied for PDPH. Only 9 patients developed PDPH with an overall incidence of 1.34% (9/670), of these 9 patients, 5 patients had mild, 3 had moderate headache and the other 1 had severe headache. Of the 5 patients who had mild headache, 3 patients received 2 pricks during lumbar puncture while 2 patients received single prick. In our study, 83.13% patients received single prick and the remaining 16.87% received double prick. In patients who received single prick, the needle orientation in relation to longitudinal dural fibres during lumbar puncture was parallel in 80.78% [450/557 (PDPH incidence 1/450=0.229%)] and perpendicular in 19.21% [107/557 (PDPH incidence 1/107=0.93%)] cases in this study. The frequency of PDPH was related to the direction of the bevel during introduction of the spinal needle. Patients who were administered spinal anaesthesia when the spinal needle bevel was directed perpendicularly to the longitudinal dural fibres were 4 times more likely to develop PDPH compared to when needle bevel was oriented parallel. In all other patients who received double prick, needle was oriented parallel to the longitudinal dural fibres. It is presumed that parallel orientation separates the dural fibres whereas perpendicular cuts the dural fibres thereby creating a bigger hole in the dura. All 3 patients with moderate headache and the one with severe headache had received 2 pricks while giving spinal anaesthesia. Patients with mild headache started with the symptoms on 2nd day

after spinal anaesthesia which was treated with analgesics (paracetamol) and then disappeared on the 3 day. The other 3 patients with moderate headache had other associated symptoms of nausea and vertigo. The headache developed after 24hours of spinal anaesthesia and subsided on the 4th day with analgesics and hydration. The one with severe headache had nausea, vomiting, vertigo and back pain upto 5 day post spinal anaesthesia which was treated with injectable analgesics good hydration and patient was in recumbent position most of the times with only bedside ambulation and physiotherapy allowed.

Table 1: Incidence of PDPH in study population

PDPH	Frequency	Percentage
Present	9	1.34
Absent	661	98.66
Total	670	100

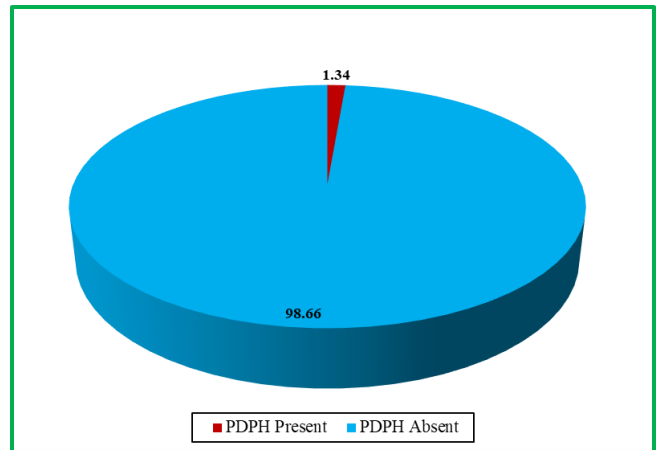


Fig 1: Incidence of PDPH in study population

Table 2: Distribution of study population according to number of pricks

Number of pricks	Frequency	Percentage
Single Prick	557	83.13
Double Prick	113	16.87
Total	670	100

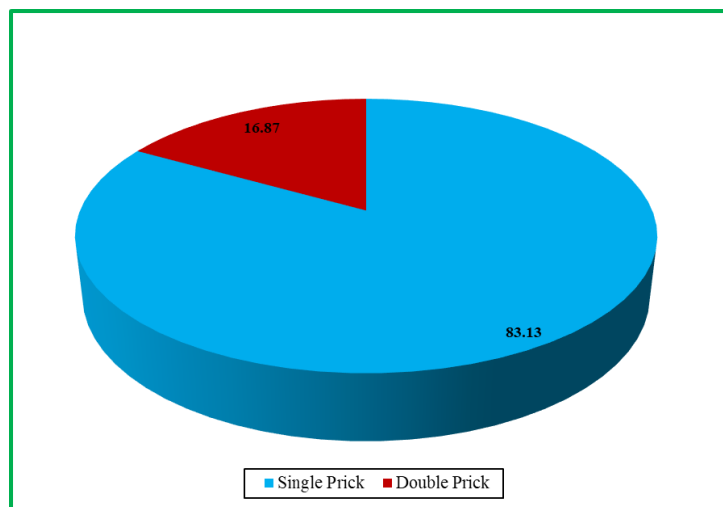


Fig 2: Distribution of study population according to number of pricks

Discussion

The present trend of the anaesthesia technique for caesarean section is spinal anaesthesia because it is easier to perform,

safe to the mother and the fetus and has a high degree of success rate. However, PDPH is a common complication and results in increased morbidity, prolonged hospital stay

and patient dissatisfaction. This study has shown the incidence of PDPH in patients undergoing LSCS following spinal anaesthesia at LD Hospital Srinagar. Only Quinckes spinal needle of 26G were used to administer anaesthesia in all the cases.

In our study the overall incidence of PDPH in patients undergoing caesarean section under spinal anaesthesia is 1.34%. Overall incidence of PDPH after dural puncture varies from 0.1-36% [5]. 2-10% incidence was reported with a 26G needle, and less than 2% with a 29G needle.

The mean age of patients was 27.5 years which lies in the age group between 20-35 years having the maximum incidence of developing PDPH). Our study is consistent with the findings of Samuel M (2009) [6] who conducted a study in which the mean age of study patients was 29.3 years. This mean age group lies within 18-30 years which is associated with the highest frequency of PDPH [5, 7, 8]. Vallejo et al in their study noted a mean age of 32.1 years in the 172 patients in whom spinal anaesthesia was performed using G25 Quincke point needles [9].

In patients who received single prick, the needle orientation in relation to longitudinal dural fibres during lumbar puncture was parallel in 80.78% (PDPH incidence 1/450=0.229%) and perpendicular in 19.21% (1/107=0.93% PDPH incidence) cases in this study. The frequency of PDPH was related to the direction of the bevel during introduction of the spinal needle. PDPH incidence is four times more in perpendicular than in parallel orientation of the needle bevel.

Patients who were administered spinal anaesthesia when the spinal needle bevel was directed perpendicularly to the longitudinal dural fibres were 2.6 times (95% CI) more likely to develop PDPH compared to when the needle bevel was oriented parallel (Samuel M., 2009) [6]. Lybecker et al had a similar observation [10].

In this study 83.13% patients had only one dural puncture attempt while the rest had two attempts. In this study all the procedures were performed by the same anesthesiologists. It has been shown that PDPH is more common if two verified punctures into the SAB space are made. Patients who had more than one attempt were 17 times more likely to develop PDPH. This was statistically significant ($p < 0.001$).

It has been shown that PDPH is more common if two verified punctures into the subarachnoid space are made [11]. Patients who had more than one attempt were 1.2 times more likely to develop PDPH. However, this was not statistically significant ($p > 0.05$). Lybecker et al in their study also did not find any statistically significant association between PDPH and the number of attempted dural punctures ($p = 0.091$) [10].

In our study, onset of headache occurred on 2nd day in all patients. The onset of headache after lumbar puncture is usually within 24-48 hours after dural puncture.

Samuel M (2009) [6] in their study found that onset of headache occurred in 84.5% of the patients in the first day, 12.1% of patients on the second day and 1.7% on the third day after dural puncture. Shah A *et al.*, in their study noted that the onset of headache was within 24 hrs to 72hrs after dural puncture [12]. The onset of headache after lumbar puncture is usually within 24-48hrs after dural puncture, but could be delayed up to 12 days [9]. This is consistent with our study.

Of the 9 patients who developed PDPH, 5 had mild headache, 3 had moderate and 1 had severe headache. Nafiii

et al., in their study most patients rated their headache as mild to moderate on a 10-cm visual analog scale [12]. Kuntz et al in their study, of the 107 patients who developed headache, the severity of PDPH on the 1st day of occurrence was mild in 54%, moderate in 31% and severe in 15% [13].

Conclusion

The overall incidence of PDPH in patients undergoing caesarean section under Spinal Anaesthesia at LD Hospital was 1.34%. Multiple dural puncture attempts were associated with 17 times more risk of development of PDPH when compared to single attempt. The orientation of needle bevel perpendicular to the longitudinal dural fibres was associated with 4 times more risk of developing PDPH when compared to the parallel orientation. There was no statistical significance between the age and incidence of PDPH among the patients who developed PDPH.

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