Incidence of Post Dural Puncture Headache and its Management at Manipal Teaching Hospital, Pokhara, Nepal

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ABSTRACT

Introduction: Postdural puncture headache is the most common complication after spinal anaesthesia. In about 85%, it resolves without any specific treatment but sometimes it leads to serious complications such as subdural haematoma and seizures, which could be fatal. Spinal anaesthesia is the most popular anaesthesia technique for Cesarean section. Emphasis on prevention and optimal treatment of postdural puncture headache is very important. This study is aimed to determine the incidence of postdural puncture headache following Cesarean section via spinal anaesthesia and evaluate the different methods of management so as to prevent the complications.

Materials and Methods: This is a cross sectional study done in post natal ward of Manipal Teaching Hospital conducted for six months. Total of 261 pregnant women who underwent Cesarean section under spinal anaesthesia were taken and were observed for symptoms of postdural puncture headache. Medications were prescribed for the treatment of the same. Data was collected and analysed using various statistical tools.

Result: Of the total 261 patients, there were 28 (10.8%) cases with postdural puncture headache. Patients were managed by both conservative and pharmacological methods. Commonly used analgesics were combination of paracetamol and ibuprofen in 6(35.3%) patients. Conservative management included bed rest, supine positioning, adequate hydration and intake of coffee.

Conclusion: It was observed that use of small gauze needle size (25G) significantly reduced the chance of postdural puncture headache. Commonly used analgesics like paracetamol and ibuprofen combination, diclofenac could cure the headache.

Keywords: Cesarean section, spinal anaesthesia, post dural puncture headache, lumbar puncture.

INTRODUCTION

Cesarean section (C-section) is a surgical procedure used to deliver a baby from the abdomen of a pregnant woman. This is an alternative to the more common vaginal delivery. Delivering a baby through C-section always requires some form of anesthesia. Spinal anaesthesia is the most popular anaesthesia technique for C-section. A study done in 2019 reported that 21.7% of women experience headaches following the procedure.[1] These headaches are known as post spinal headache/post

dural puncture headache(PDPH) which is the most common complication of spinal anaesthesia.

According to the Headache Classification Committee of the International Headache Society, headache after lumbar puncture is defined as "bilateral headache that develops within 7 days after a lumbar puncture and disappears within 14 days. The headache is usually positional (worse when upright, better when lying flat) and may be accompanied by neck stiffness, tinnitus, hypoacusia, photophobia, and nausea.[2]

Generally, 85% of headaches after lumbar puncture will resolve without any specific treatment.[3] Although PDPH usually resolves spontaneously, it has the potential to cause significant morbidity in obstetric patients. When severe or pro-longed, PDPH may become incapacitating and sometimes severe enough that it compromises the ability of the mother to care of herself or her child. It can prolong hospital stay and can increase the overall cost of healthcare.[4, 5] If untreated, it can result in serious complications such as subdural haematoma and seizures, which could be fatal. Because of its profound consequences, emphasis on prevention and optimal treatment of PDPH after C- section is very important.

General measures such as supine positioning, taking plenty of fluids, including drinks containing caffeine (tea, coffee and some other soft drinks) and simple analgesics, opioids and anti-emetics may control the symptoms in milder cases.

However, if conservative measures fail to resolve headaches after lumbar puncture, then specific treatment is indicated 72 hours after the onset of pain, as it would avert the catastrophic complications of subdural haematoma and seizures that could be fatal. In one survey, 4 of 14 patients with subdural haematoma after dural puncture died.[6]

The objectives of this study is to determine the incidence of PDPH in women who had undergone C-section under spinal anaesthesia and also to evaluate the different methods of management of the same condition.

MATERIALS AND METHODS

A cross sectional study was carried out at the Postnatal Ward, Department of Obstetrics and Gynecology, Manipal Teaching Hospital over a period of six months. The ethical clearance was taken from the institutional review committee (IRC) ,Manipal Teaching Hospital (MTH) with the reference code MEMG/IRC/430/GA to conduct the study. Sample size for this study was 261 which was calculated by the following formula .

$$\text{Sample size} = \frac{Z_{1-a/Z}^{2}\, P(1-p)}{d^2}$$

Here,

$Z_{1-a/Z}$ = standard normal variate (at 5% type 1 error $p<0.05$) it is 1.96

p=expected proportion in population based on previous study or pilot study

d= obsolute error has to be decided by the researcher.

With reference to similar recent study done in 2019, expected PDPH patients is taken as 21.7% .[1] p value becomes 0.217. Obsolute error is taken as 5% so d is 0.05

Applying the above formula

$$\text{Sample size} = \frac{(1.96)^2 \times 0.217\,(1-0.217)}{0.05^2}$$

$$= 261$$

Women indicated for C-section following spinal anaesthesia of any age, gravida, religion, and ethnic group and who had given consent were taken in the study. Women who underwent C-section with anaesthesia other than spinal anaesthesia were excluded. The information regarding demographic profiles, presenting complaints of PDPH of the patient were recorded. The time of onset of headache and the nature of headache that define PDPH like postural nature, or any associated symptoms like neck stiffness, nausea, vomiting, tinnitus, photophobia are present or not were observed. Women were regularly followed up after 24 hours, 48 hours, 72 hours, 5 days and till time of discharge to find out if they had developed PDPH and also to know the duration of headache during hospital stay. The case record sheet of women having PDPH were reviewed and women were asked verbally if

they had symptoms of PDPH or not in details.The methods of management employed in PDPH were noted, whether it was managed by pharmacological therapy or with conservative methods.

Data collected were entered in Microsoft Excel and descriptive statistical analysis was done using statistical tool SPSS 25 version. Results were given in numbers and percentages. The rate of PDPH was calculated. The total number of drugs prescribed along with their dose, duration and frequency were observed. Conservative methods if advised were also noted from patient case sheet.

RESULT

A total of 261 women who underwent C-section under spinal anaesthesia were taken in our study. The mean age of women was 25 years with SD of ±7.5 and having age range from 18-49 years. All the respondents (100%) were given spinal anaesthesia with 25 gauze needle size.

Most of the women in this study were housewife 83 (31.9%). The major indication for C-section was oligohydroamniosis 41(15.8%) followed by arrest of labor 31(11.9%)(Table 1).Half of the pregnant women 130 (50%) in this study were in multiparas (2nd gravadarium). The incidence of PDPH after C-section found in our study was only 28 (10.8%). Out of 28 women with PDPH, 12(42.9%) of them reported post dural headache on first day of operation (Table 2).

Table 1: Indication for Cesarean section

Indications	Frequency (n)	Percentage (%)
Emergency	13	5.0
Oligohydoamniosis	41	15.8
Fetal distress	8	3.1
Decrease fetal movement	13	5.0
Cephalopelvic disproportion	15	5.8
Arrest of labor	31	11.9
Breech presentation	27	10.4
Premature rupture of membrane	26	10.0
Preeclampsia	10	3.8
Eclampsia	4	1.5
Inadequate pelvic size	8	3.1
Previous h/o LSCS	30	11.5
Twin pregnancy	4	1.5
Hyperthyroidism	3	1.2
Preterm labour	5	1.9
Bleeding	2	.8
Pregnancy induced hypertension	10	3.8
Elective C.S	8	3.1
Ovarian cyst	2	.8
Total	**261**	**100.0**

Table 2: Onset of headache after Cesarean section

Onset of PDPH	Frequency (n)	Percentage (%)
On 1st postoperative day	12	42.9
On 2nd postoperative day	10	35.7
On 3rd postoperative day	5	17.9
after 5 days	1	3.6
Total	**28**	**100.0**

The common nature of headache found in this study was that headache aggravated on upright position and decreased on recumbent position which was seen in 8(28.6%) of the PDPH patient (Table 3).

Table 3: Nature of headache

Nature of headache	Frequency (n)	Percentage (%)
Headache on upright position and disappear on recumbent position	8	28.6
Neck stiffness	6	21.4
Photophobia	2	7.1
Nausea	1	3.6
Headache on upright position, neck stiffness, tinnitus,	8	28.6
Neck stiffness, photophobia, nausea	2	7.1
Headache on upright position, neck stiffness, nausea	1	3.6
Total	**28**	**100.0**

The patient of PDPH were managed by 3 methods: conservative management, pharmacological

management and both conservative and pharmacological methods . The frequency with their percentage of management methods are given in Table 4.

The conservative measures included bed rest, hydration, caffeine supplementation,
and pharmacological method included analgesic medications.

Table 4: Methods of treatment of PDPH

Treatment methods	Frequency (n)	Percentage (%)
Conservative	11	39.3
Pharmacological	4	14.3
Both conservative and pharmacological	13	46.4
Total	**28**	**100.0**

Different types of analgesics prescribed to the PDPH women were paracetamol +ibuprofen(combination), diclofenac, paracetamol and codeine+ paracetamol (combination) but none of them received more than one group of analgesic. (Table 5)

Table 5: Pharmacolgical management of PDPH

Drugs	Frequency (n)	Percentage (%)
Paracetamol +ibuprofen (Combination)	6	35.3
Diclofenac	4	23.5
Codeine + Paracetamol (Combination)	4	23.5
Paracetamol	3	17.6
Total	**17**	**100.0**

Out of 17 patients who received drugs,15(88.2%) took the drugs by oral route whereas 2(11.8%) received by intramuscular route. The total duration of treatment of headache with analgesic varied from one patient to other. Majority of the patients 9(52.9%) analgesic was prescribed for nonspecific duration i.e until the headache subsided, n 7 cases (41.2%) it was prescribed for 3 days and rest took analgesic for 5 days. Out of 17 patient who were on drug therapy for PDPH, 11(64.7%) took the drugs whenever headache was there(SOS) and remaining 6(35.3%) took three times a day (TDS).

Conservative management was applied to 24 respondents out of which 16(66.7%) were suggested to take bed rest and adequate hydration, 7(29.2%) were asked to do bed rest in supine position and remaining 1(4.2%) was suggested for bed rest in supine position and adequate intake of coffee.

DISCUSSION

The incidence of PDPH varied in different studies, ranging from 1% to 75% .[7, 8] The result of our study showed PDPH in 28 cases (10.8 %) among women undergoing C- section at Manipal Teaching Hospital which was near to the findings in a study done at Bharatpur Medical College in which incidence was 14.9%.[9] The incidence of PDPH was much higher in other studies done in Nairobi (24.4%)[10] and in Kasr El aini teaching hospital in Cairo, Egypt where the overall incidence was reported as 32.58%[11] and in the study done by Phili Nambooze, et al the PDPH incidence was found 48.8%.[12]

The needle size and type of needle also has great influence on prevalence of PDPH. In this study all the participants were given spinal anaesthesia by 25 gauze Quincke needle size which resulted in 10.8% incidence of headache. Whereas different studies used different needle size that result in varying incidence of PDPH. The incidence was about 40% with a 22G needle; 25% with a 25 G needle[13, 14] 2%-12% with 26 G Quincke needle; [13, 15] and <2% with a 29 G needle.[16]

Regarding the onset of PDPH, present study found that majority of respondents i.e. 42.90% out of 28 suffered from headache on first day which is consistent with the study conducted by Singh et al,who found that the onset of headache was within 24 hours in 80% of patients.[17] However in other study it has been reported to occur in 90% of patients within the first 72 hours. [7]

The nature of PDPH in the present study was similar to other studies conducted by different authors. 46.4% of PDPH patients in this study showed good response with combination of conservative and pharmacological management which is in contrast with the study in which more than 85%

of PDPH resolved with conservative treatment.[18] Simple analgesic like paracetamol, diclofenac etc were used in our study whereas in some studies gabapentin, pregabalin and paracetamol were used commonly which significantly reduce the symptoms of PDPH.[19] A few case reports have described the relief of PDPH with sumatriptan.[20, 21]

CONCLUSION

The incidence of PDPH after C-section under spinal anaesthesia was found to be significantly less in our study when compared to other studies. A small gauze needle is significantly superior to a large gauze needle in reducing PDPH after spinal anaesthesia. Conservative management like bed rest, hydration and positioning along with simple analgesics like paracetamol or combination of paracetamol and ibuprofen for 3-5 days relieved the symptoms of PDPH.

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Conflict of interest

None.

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