DOI: 10.7860/JCDR/2022/52223.15946

Short Communication

Anaesthesia Section

Influence of Season on the Incidence of Postdural Puncture Headache- A Clinical Audit

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ABSTRACT

Introduction: Postdural Puncture Headache (PDPH), even though becoming uncommon, is still one of the distressing postoperative complications after spinal anaesthesia. The reports on the incidence of PDPH are inconsistent, being 2-40% with different sizes of needles. A previous study conducted by the authors in the winter months in non obstetric cases, found a low incidence of PDPH and authors had suggested that there is a need to examine the association between PDPH and different seasons.

Aim: To find out the incidence of PDPH in obstetric population and any finding for differential incidence with different seasons.

Materials and Methods: The present study was a single centre retrospective clinical audit of lower segment caesarean cases (N=782) under spinal anaesthesia with 25-gauge Quincke needle. The records of summer and winter months were separated as two groups for each year of 2019 and 2020. The cases done in the months of March, April and May formed the summer group, while the October, November and December patients formed the winter group.

Results: There was no significant difference between the groups with regard to age (p-value=0.5). The incidence of PDPH was significantly higher in summer months than winter months in two consecutive years (p-value=0.0068). Fourteen out of 390 patients in the summer group and one out of 392 patients of the winter group suffered from PDPH overall.

Conclusion: There should be an urgent need to control ambient temperature in patients at risk of PDPH. The optimisation of coincident dehydration is essential.

Keywords: Dural puncture, Lower segment caesarean, Spinal anaesthesia

INTRODUCTION

Regional anaesthesia especially spinal anaesthesia is a very common and popular technique for infra-umblical surgeries especially caesarean sections. Since the introduction of spinal anaesthesia, the headache after the procedure has remained a well-recognised complication. PDPH occurs due to the fact that Cerebrospinal Fluid (CSF) leaks out from the breach or a small hole that the needle has made in the duramater [1]. In a retrospective study, the incidence of PDPH in the patients who received spinal anaesthesia was 3.9%. The incidence increased to 25% with accidental dural puncture. The reports on the incidence of PDPH are variable, being 40% with a 20-gauge needle, 25% with a 25-gauge and less than 2% with a 29-gauge needle [2].

Other than the needle size, innumerable factors like age, sex, pregnancy, size and type of needle, profile of needle entry have been implicated in the incidence of headache [3]. A previous study conducted by the authors, in the winter months in non obstetric cases, found a low incidence of PDPH and they suggested that they need to examine the association between PDPH and different seasons [4]. With this background knowledge, single centre clinical audit was conducted on the incidence of PDPH in patients undergoing lower segment caesarean under spinal anaesthesia with 25-gauge Quincke needle.

MATERIALS AND METHODS

This retrospective clinical audit was conducted at KRG Nursing home, Kumbakonam, Tamil Nadu, India, from 2019 to 2020. The records of patients for six months in a year for two successive years were studied, cases done in the months of March, April and May formed the summer group (n=390), while the October, November and December patients formed the winter group (n=392). Ethical approval from Institutional Administrative Committee approval was obtained (KRGNH-01-02/01/2021).

Inclusion and Exclusion criteria: Cases done in month of March, April, May, October, November, December in study period and patients, who underwent elective and semi-emergent caesarean sections under spinal anaesthesia were included in the study. Cases performed in the other months were excluded. Also patients who were migraineurs or had headache with severe pre-eclampsia who underwent the surgeries, were excluded from the study.

The sample size was the number of actual cases which got operated in these months of two years.

Procedure

All the patients received the same fluid protocol. All the patients were given spinal anaesthesia with 2 to 2.2 mL of hyperbaric bupivacaine to achieve a level of T8 to T6 with 25-gauge Quincke needle. The postoperative and ambulation protocols were similar in both the groups. The incidence of PDPH and other headaches were noted. Any headache that developed after 12 hours with postural variation which decreased in 7 to 10 days were considered as PDPH while others were termed as other headaches. By postural variation, the authors meant patients who had severe headache with sitting position but the intensity decreased with supine position. The obstetrician and the anaesthesiologists were involved in the diagnosis and the management. The patients who developed other type of headaches were also noted in both the groups. It is the protocol of the Institute to note complaints of headaches. Any postural variation, if present, was noted.

The treatment usually was parenteral sumatriptan and non steroidal analgesic agents. Any other event mentioned in the chart was noted. Epidural blood patch was planned for severe refractory headaches.

STATISTICAL ANALYSIS

The data were spread in an excel sheet, spread over to Statistical Package for the Social Sciences (SPSS) software version 21.0 to find out the seasonal difference through application of Chi-square tests. A p-value of <0.05 was considered significant.

RESULTS

The number of patients who underwent caesarean section in this single centre, their respective ages and the incidence of PDPH are given in [Table/Fig-1]. There was no significant difference between the groups with regard to age (p-value=0.5). The cumulative numbers of both the years and differential incidence of PDPH with p-value is shown in [Table/Fig-2].

Year-season	No. of cases (caesarean)	PDPH	Other headaches	Co-morbid illness cases	Age (years) Mean±SD
2019-summer	209	6	1	BA-2 GDM-5	26.65±3.6
2019-winter	201	0	1	BA-1 GDM-5	27.05±3.8
2020-summer	181	8	2	BA-1 GDM-6	27.25±4.1
2020-winter	191	1	1	BA-0 GDM-3	26.85±5.2

[Table/Fig-1]: The details of cases and headaches in both the groups.
PDPH: Postdural puncture headache; SD: Standard deviation; BA: Bronchial asthma; GDM: Gestational diabetes mellitus

Season	Number of cases	Incidence of PDPH in numbers
Summer	390	14
Winter	392	1
p-value	0.0068	

[Table/Fig-2]: Cumulative incidence for two years.

On applying Chi-square test, the incidence of PDPH was found to be significantly higher in summer than in winter season for both the consecutive years (year 2019, p-value=0.015; year 2020 p-value=0.0146). Considering the total number of cases in both the years, the incidence of PDPH is significantly higher in the summer group (p-value=0.0068). All the patients became better with routinely prescribed parenteral drugs and none needed epidural blood patch. Almost all the patients except four, received the block in a single attempt. These four patients were distributed equally in all the groups and were included in analyses. Incidences of other headaches were negligible and appeared grossly comparable between the groups. There were rare incidences of co-morbidities like bronchial asthma and well controlled gestational diabetes mellitus in both the groups [Table/Fig-1]. There were no major neurological co-morbidities. The fluid management protocol was similar in both the groups.

DISCUSSION

Spinal anaesthesia is one of the common modes of anaesthetising obstetric patients. The intense analgesia, motor block, sparing of airway made it very popular for pregnant women. But the incidence of headache was nagging. The factors related were needle size, way of entry and any accidental dural puncture with an epidural needle. In a review of the severity of postspinal headache, dehydration has been implicated as a predisposing factor. The authors have stated that, rehydration betters the symptomatology. Hence, an increasing ambient temperature and the dehydration which follows may be detrimental [5]. In developing countries like India, all the patients may not have access to centrally air-conditioned rooms. This implies that an increase in ambient temperature of summer and the associated dehydration may worsen PDPH. Furthermore, an increased incidence of headache but not PDPH has been associated with high relative humidity during warm seasons in a separate study [6]. This study was done in Boston which is relatively cooler than our place. In the present study geographical area, (Kumbakonamof Thanjavur delta near Puducherry) the average temperature is around 40°C in summer and 20°C in winter. The fluid management remained the same in spite of extreme weather and the variable amount of insensible water loss and resultant dehydration thus remained unaccounted. Nonetheless, there might have been a slight difference in the fluid management between elective and emergency caesarean section cases in the present audit because elective caesarean delivery cases were allowed clear fluids till four hours before surgery. Very sick patients who were likely to get multiple transfusions or with major haemodynamic shifts are not part of the present study.

Limitation(s)

The present study has a lot of limitations as being a clinical audit and the authors have not actually measured the ambient temperature for every case. Authors also admit, that, these results cannot be extrapolated to other countries with variable ambient temperatures and humidity. Authors suggest that, in case of accidental dural puncture, with a high possibility of PDPH, the ambient temperature can be controlled to decrease the morbidity.

CONCLUSION(S)

Authors thus, concluded, that PDPH is more common with an increase in ambient temperature like in summer, especially in developing tropical countries where maintenance of uniform ambient temperature is not always possible. The present audit provides a novel observation regarding variation in ambient temperature and PDPH. Authors suggest that, postoperative fluid management should be in tune with the ambient temperature to prevent PDPH. Large studies are warranted on this interesting topic.

Authors contribution: TSS has done the data collection and SPS has done the write up and the communication.

REFERENCES

[1] Jabbari A, Alijanpour E, Mir M, Bani Hashem N, Rabiea SM, Rupani MA. Post spinal puncture headache, an old problem and new concepts: Review of articles about predisposing factors. Caspian J Intern Med. 2013;4:595-602.
[2] Bakshi SG, Gehdoo RS. Incidence and management of postdural puncture headache following spinalanaesthesia and accidental dural puncture from a non obstetric hospital: A retrospective analysis. Indian J Anaesth. 2018;62:881-86.
[3] Thummala V, Nageswararao L, Swetha D, Sriharitha S, Mounica U. Accidental dural puncture-perioperativemanagement. Indian J Anaesth. 2020;64:425-27.
[4] Parthasarathy S, SivashanmughamT. Incidence of postdural puncture headache in Indian population. a need for a relook. Asian J Pharm Clin Res. 2016;2:230-32.
[5] Nath S, Koziarz A, Badhiwala JH, Alhazzani W, Jaeschke R, Sharma S, et al Atraumatic versus conventional lumbar puncture needles: A systematic review and meta-analysis. Lancet. 2018;391(10126):1197-204.
[6] Li W, Bertisch SM, Mostofsky E, BuettnerC, A Mittleman M. Weather, ambient air pollution, and risk of migraine headache onset among patients with migraine. Environment International. 2019;132:105100.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Sep 03, 2021
- Manual Googling: Dec 14, 2021
- iThenticate Software: Dec 18, 2021 (3%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? No
- Was informed consent obtained from the subjects involved in the study? NA
- For any images presented appropriate consent has been obtained from the subjects. NA

Date of Submission: **Sep 02, 2021**
Date of Peer Review: **Nov 13, 2021**
Date of Acceptance: **Dec 16, 2021**
Date of Publishing: **Feb 01, 2022**