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Original Research

To study the Prevalence of Post-Dural Puncture Headache (PDPH) after Cesarean Delivery under Spinal Anesthesia

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ABSTRACT:

Aim: To study the Prevalence of Post-Dural Puncture Headache (PDPH) after Cesarean Delivery under Spinal Anesthesia. **Methods:** This Cross Sectional study conducted in the Department of Anaesthesiology. The entire procedures were performed at sitting position. The backside of the patients was cleaned with Iodine and alcohol. Spinal anaesthesia was done using a midline approach at the L2-3 or L3-4 interspaces by using different size of spinal needles and 0.5 % isobaric bupivacaine 2.5-3.0ml was injected. **Results:** The 80 Patients were included in this study. All patients were either ASA I or ASA II. 10% patients had a previous history of spinal anesthesia exposure and 2 of them complained a PDPH like headache after the procedure. All patients had given spinal anesthesia on sitting position. 21 G needle is the most frequently used spinal needle which is 46.25% of total patients whereas 20 G is used as 2.5%. There were 1 cases (1.25%) diagnosed as failed block which were converted to general anesthesia. None of patients developed PDPH. In this study PDPH was present in 33 patients (41.25%). **Conclusion:** In conclusion, the prevalence of PDPH was higher, 41.25% compared with most other studies.

Keywords: PDPH, Spinal anaesthesia, Cesarean Delivery

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INTRODUCTION

The use of neuraxial anesthesia for caesarean section has dramatically increased, and the data since 1997 suggest that the use of general anesthesia for caesarean section has been steadily declining.[1] Neuraxial anesthesia techniques have several advantages, like decreased risk of failed intubation and aspiration of gastric contents, avoiding the use of depressant agents, and the ability of mother to remain awake and enjoy the birthing experience, and reduced blood loss.[2] Spinal anesthesia seems to be particularly well suited for caesarean section because of rapid onset of dense block that is achieved, moreover, failures are very infrequent.[3] However, since the introduction of spinal anestheia, post-dural puncture headache has remained a well-recognized complication. The overall incidence of post-dural pucture headache varies from 0.1%-36%.[4] It may be mild or severe and debilitating headache, and may be associated with neurological symptoms. Post-dural puncture headache occurs very rarely immediately after dural puncture. 60% of PDPHs will begin within 2 days of having had dural puncture, 90% within 3 days, though it may occur up to 14 days later.[5]

PDPH, also known as postspinal puncture headache, is an unpleasant complica- tion that can develop after spinal anesthesia. Its incidence ranges between 2% and 40% according to the needle type and size.[6] PDPH usually occurs within 1–2 days after dural puncture, and the majority of patients respond to simple analgesia such as paracetamol, caffeine, bed rest, and good hydration maintenance. If the complication persists, an epidural blood patch should be administered. PDPH usually lasts between 5 and 7 days and is characterized by severe frontal or occipital headache that increases with sudden movement, getting up from supine position, cough- ing, and straining. In severe cases, there may be vision and hearing alterations as a result of traction on cranial nerves.[7] Several risk factors have been attributed to PDPH including age, weight, needle size and design, and number of puncture attempts.[5,6] For example, it has been reported that there is an inverse relationship between the incidence of PDPH and both age and

weight.[7] In addition, needle size and design appear to play a crucial role in the incidence of PDPH.[6–8] Reducing the size of the spinal needle has been shown to significantly reduce the prevalence of PDPH.[6,7]

MATERIAL AND METHODS

This Cross Sectional study conducted in the Department of Anaesthesiology, after taking the approval of the protocol review committee and institutional ethics committee.

All consecutive cesarean section patients at postoperative period were included by fulfilling the inclusion criteria of ASA status I - II patients after Cesarean Section was done upon spinal anesthesia. There were cases rejected as exclusion criteria of Uncooperative patients, Patients with impaired cognitive ability and Patients with eclamsia. Independent variables are age, body mass index (BMI), and American society of Anesthesiologist (ASA), needle size, neddle design, position, and number of attempts and previous history of PDPH. Total 80 patients were included in this study.

The entire procedures were performed at sitting position. The backside of the patients was cleaned with Iodine and alcohol. Spinal anaesthesia was done using a midline approach at the L2-3 or L3-4 interspaces by using different size of spinal needles and 0.5 % isobaric bupivacaine 2.5-3.0ml was injected. The intra operative information could be collected by one of the data collector from each patient chart. Patients were interviewed by another data collector on day 1, 2, 3 and were questioned as regard to headache, location, character, and duration, associated symptoms like neck stiffness, tinnitus, hypoacusia (partial loss of hearing), photophobia, and nausea. PDPH was diagnosed as fulfilling the following criteria. These are headache develops within 3 days after dural puncture, headache that worsens within 15 minutes after sitting or standing and improves within 15 minutes after lying down, and with at least one of the following symptoms : neck stiffness, tinnitus, hypoacusia, photophobia and nausea were included.

DATA ANALYSIS

Data were analyzed in SPSS version 25.0 by using bi-variant and multi-variant logistic regression. Odds ratio with 95% confidence interval and p-value were computed to determine the strength of the association. A p-value <0.05 was considered as statistical significant.

RESULTS

The 80 Patients were included in this study with fulfilling the criteria. The mean age of patients participated in study was 29.58 years old with a standard deviation of 4.77 years old and 20 years old is the minimum age of patients participated in this study, where as 45 years old is the maximum age. All patients were either ASA I or ASA II. (Table 1)

Table 1 Demographic profile of the patients

Demographic profile	Number of patients	%
Age in years		
20 – 32	62	77.5
32 - 45	18	22.5
BMI		
< 18.5 (underweight)	2	2.5
18.5 – 24.9 (normal)	72	90
>24.9 (over weight)	6	7.5
ASA status		
ASA I	70	87.5
ASAII	10	12.5

10% patients had a previous history of spinal anesthesia exposure and 2 of them complained a PDPH like headache after the procedure. All patients had given spinal anesthesia on sitting position. 21 G needle is the most frequently used spinal needle which is 46.25% of total patients whereas 20 G is used as 2.5%. There were 1 cases (1.25%) diagnosed as failed block which were converted to general anesthesia. None of patients developed PDPH (Table 2).

Table 2 Spinal anesthesia

Spinal anesthesia	Number of patients	%
Previous spinal anesthesia		
Yes	8	10
No	72	90
Previous history of PDPH		
Yes	2	2.5
No	78	97.5
Position of spinal anesthesia done		

Sitting	80	100
Lateral	0	0
Number of attempts		
Single attempts	64	80
Twice attempts	12	15
>2 attempts	4	5
Size of spinal needle		
20 Gauge	2	2.5
21 Gauge	37	46.25
22 Gauge	24	30
23 Gauge	4	5
24 Gauge	7	8.75
25 Gauge	6	7.5
A successful block		
Yes	79	98.75
No	1	1.25
Associated symptoms		
Neck stiffness	30	37.5
Tinnitus	2	2.5
Hyper accusia	1	1.25
Photophobia	2	2.5
Nausea	14	17.5
None	31	38.75

Hosmer-Lemeshow test of goodness of fit was performed to check the appropriateness of the model for analysis. Variables found to be significant at a binary logistic regression were: needle size and number of attempts. After analysis with multivariate logistic regression needle size and number of attempts were found to be significant at p-value<0.05 (Table 3). Size of the needle used to administer spinal anesthesia is significantly associated with the development of PDPH. Patients received spinal anesthesia using bigger spinal needles were more than eight times more likely to develop PDPH than patients who received spinal anesthesia using smaller needles. Another significant association was found between number of attempts and PDPH. Patients who received spinal anesthesia (SA) with multiple attempts were four times likely to develop PDPH than their counter part patients who had a single attempt.

Table 3 Factors associated with PDPH

Variables		**PDPH**		**AOR(95% CI)**	**P – value**
		Yes	**No**		
Spinal needles	Big needles (20 G ,21 G & 22 G)	33	30	7.9 (0.06-0.39)	
	Small needles(23 G,24 G, 25 G)				
		2	15	1	0
Attempt	multiple	3	10	4.71 (0.54–37.99)	
	Single	5	62	1	0.011

In this study PDPH was present in 33 patients (41.25%).

DISCUSSION

The present trend of the anesthetic technique in caesarean section is spinal anesthesia because it's easier to perform, safe to the mother and the fetus, and has a high degree of success rate. However, Post-dural puncture headache is a well-known complication of spinal anesthesia. It is a common and incapacitating compilation following dura-arachnoid puncture and results in increased morbidity, prolonged hospital stay, increased cost, and patient dissatisfaction. Post dural puncture headache (PDPH) has been believed to be a major problem of patients after spinal anesthesia.

The overall postdural puncture headache in this study was 41.25% which is comparable to Egypt study,[12] but excessively higher than other studies report.[9-12]

The high percentage of prevalence of PDPH in this study might be related with the most 83.75 % of participants were received spinal anesthesias using big spinal needle. Specifically, the contribution of big needle was strongly significant association for the over all of PDPH as compared with small needles. This higher PDPH percentage after spinal anesthesia by using big needles were 7.9 times more likely to develop PDPH than small needles (AOR= 7.9; 95%

CI: 0.06, 0.39; p = 0.0001). This might be linked with larger needles put down wider opening on the dura which allowed more CSF pour out than smaller hole caused by smaller needles. Our finding is in line with different studies.[13-16] However, we couldn't see the associations to the outcome variable on type of design of needle, because of all were Quincke type.

The other significant association was found linking the number of attempts and the development of PDPH. The spinal anesthesia was successful at first attempts with 83.75% which is less likely to develop PDPH than those patients who have repeated attempts. In addition, patients who had an attempt of more than once are about 4.71 times at risk to develop PDPH than those patients who had a single attempt (AOR=4.71; 95% CI: 0.54, 37.99; p=0.011). This could be correlated with the number of attempt to increase the probability of piercing the dura matter repeatedly will increase the volume of CSF leak, thus increasing the probability of development of intracranial hypotension & PDPH. This finding is aligned with other studies.[15] The proportion of repeated attempts of spinal needles related PDPH reports from a population based study in University of Basel, Switzerland (4.2 %)[17] was somehow lower than our report (16.25%). However, some other studies couldn't come across significant association between the number of attempts and PDPH.[18,19] Even though different studies showed on variables of the lower BMI, younger age, and previous history of PDPH are listed as risk factors for PDPH development,[14,20] our observation study did not bring into being significant association between these variables and PDPH. This might be due to the lack of sample size to compare lower to higher BMI, young to old age, and patients with versus without previous history of PDPH. There are some limitations in our study.

CONCLUSION

In conclusion, the prevalence of PDPH was higher, 41.25% compared with most other studies.

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