ORIGINAL ARTICLE

PREVALENCE OF POSTDURAL PUNCTURE HEADACHE AMONG CAESAREAN SECTION PATIENTS IN NORTH CENTRAL NIGERIA

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ABSTRACT

Background: Spinal anaesthesia is now a popular choice for Caesarean sections in Africa but one of the draw-back is the development of post-dural puncture headache (PDPH) and it could be quite distressing to a mother. Identifying risk factors and reducing the prevalence is pertinent. This study sought to determine the prevalence of PDPH among patients who underwent Caesarean sections in a tertiary hospital in Jos, Plateau State, Nigeria and some of its possible associated factors.**Method**: It was a prospective study of all Caesarean sections done under spinal anaesthesia between November 2016 and June 2017. Spinal anaesthesia was performed on 236 parturients using Quincke-type needles sizes 23-26G. In the postoperative period, all the patients were followed-up to determine the incidence, onset, and severity of post-dural puncture headache. Epi-info version 7 was used for data analysis. **Results**: The prevalence of PDPH was 22.03%. *Most of the parturients who developed PDPH in our study were of mild to moderate intensity using the numeric rating scale. Twenty six (11%) had mild, while 11 (4.7%) had moderate intensity of headache and which was* resolved with treatment. **Conclusion:** The prevalence of PDPH is high in the obstetric population especially with the use of traumatic Quincke-type needles. Deliberate efforts must be made to reduce its occurrence by acquiring of small calibre pencil-point needles and training staff on how to use it.

Keywords: Caesarean section; post-dural puncture headache; subarachnoid block.

INTRODUCTION

The International goal for protection of future mothers recommended that 80-90% of all Caesarean sections to be carried out under spinal anaesthesia.[1] Over the past few decades there has been increase in the number of caesarean sections (CS) in the developing world and a great percentage are done under spinal anaesthesia.[2,3,4] In a resource poor setting as ours, general anaesthesia is more expensive to administer. Subarachnoid blocks (SAB) popularly known as spinal anaesthesia however, is cheaper and brings maternal satisfaction to many mothers but is not devoid of some complications, among which is post-dural puncture headache (PDPH).[5,6] German Surgeon, Karl August Bier in 1898 gained first hand experience of the disabling headache related to dural puncture.[7]

The loss of cerebrospinal fluid via a dural puncture is commonly accepted as the pathophysiology. This leads to low CSF pressure following leakage of CSF through the dural puncture hole and the choroid plexus is unable to secrete sufficient fluid to maintain the CSF pressure. This results to CSF hypotension which in turn leads to intracranial venous dilation resulting in an increase in brain volume. Venous dilation and compensatory increase in brain volume will result in brain sag which in turn will exert traction and stimulate pain sensitive anchoring structures like dural vessels, basal dura and tentorium cerebelli, causing post spinal headache.[8]This condition is found to be more frequent in young females and is said to be associated with needle size and type.[9] Symptoms include a throbbing headache related to posture and presents most commonly within 48 hours of

dural puncture.[10,11] This may be associated with neck stiffness, nausea, vomiting and photophobia and could be quite distressing to the patient; this tends to increase hospital stay.[12,13,14] Hydration, bed rest, caffeine and non-steroidal anti-inflammatory drugs and epidural blood patch are often used to treat this problem. Gabapentin may be a relatively novel agent in the management of PDPH.[15]

Previous studies in African region have shown a prevalence of between 1% to as high as 32%.[5,11, 16-19] Our study set out to determine the prevalence of PDPH among patients who underwent Caesarean operations in a tertiary hospital in Jos, Plateau State and some of its possible associated causes.

MATERIALS AND METHOD

It is a prospective study using a questionnaire and data of all caesarean sections done under SAB was gathered between November 2016 and June 2017. Patients' biodata were obtained and preoperative reviews were carried out; those with contraindications for SAB were excluded. In addition, those with chronic headaches were left out as well. Prior to anaesthesia, patients were counselled for SAB, PDPH and numeric rating scale (NRS) were explained to them. They all had CS under spinal anaesthesia. Monitors were attached and basic vital signs such as respiratory rate, pulse rate, non-invasive blood pressure and oxygen saturation were taken and documented.

The hospital had only Quincke-type needles available. The patients were preloaded with 500-1000ml of normal saline; lumbar puncture was performed under aseptic conditions. After confirmation of correct needle placement, 1.6 -2.5ml of 0.5% heavy bupivacaine was injected intrathecally. Patients were then allowed to lie supine with a left lateral tilt and a pillow was placed under the head. Monitoring was continued throughout the surgery. The BP was monitored every minute for the first 20minutes, then every 5 minutes for the rest of the surgery. At the end of the procedure, the sizes of spinal needles used, number of attempts, doses of local anaesthetic and evidence of PDPH/severity among other parameters were recorded. Postoperatively, all patients were followed up for 48 hours. Postdural puncture headache in this study was described as headache in the frontal or occipital region aggravated by sitting or standing and relieved by lying flat. Severity of PDPH was graded according to the numeric rating scale. [(NRS: N = 0 (Nil pain); A=1-3(Mild), B=4-6(Moderate), C=7-9(Severe), D=10(Worst pain)].

Patients who developed PDPH were managed with bed rest, fluids and administration of caffeinated paracetamol tablets. Epi -info version 7 was used for data entry and analysis.

RESULTS

Two hundred and thirty six patients had SAB for Caesarean section out of which 52 (22.03%) patients had PDPH. The mean age of patients was 30.98 ± 6.34 years. The highest incidence of PDPH was within the age group 31-40 with 29 (24.58%) patients. Age group 15-19 years did not record any incidence, though only 4 patients belonged to this group as shown in Table 1

One hundred and thirty four (56.78%) of the 236 patients were done as emergencies and 36 (26.86%) of them had PDPH; 16 (15.67%) of the 102 elective cases had headaches as shown in Table 2.

Twenty nine (34.52%) patients who had 2 attempts at lumbar puncture before success had PDPH. The PDPH rate among those who had 4 attempts was 2(25 %) as shown in Table 3.

All the subarachnoid blocks were performed with the Quincke needle type. Size 24G was the most commonly used; out of the 116 patients who had lumbar puncture with this needle, 27 (23.28%) developed headaches. A similar percentage (43; 23.26%) of headache was seen in those in whom 23G was used. Sizes 26G surprisingly had the highest incidence of PDPH (8, 26.93%) as shown in Table 4.

The headaches were mild and moderate in 13 (61.9%) and 8 (38.1%) patients respectively as shown in fig 1. None of the patients complained of severe PDPH. All the patients who had PDPH did well on oral fluids and analgesics; none of them required epidural blood patch.

Table 1: Ages in Relation to the Prevalence of PDPH

AGE (years)	ABSENCE OF PDPH	PRESENCE OF PDPH
15 – 19 (n=4)	4 (100%)	0 (0.00%)
20 – 29 (n=95)	76 (80.00%)	19 (20.00%)
30 – 39 (n=118)	89 (75.42%)	29 (24.58%)
40 – 49 (n=19)	15 (78.95%)	4 (21.05%)
TOTAL (N=236)	**184 (77.97)**	**52 (22.03%)**

Table 2: Doses Local of Anaesthetic and Prevalence of PDPH in Elective/Emergency C/S

VARIABLE	Frequency	Percent
DOSE (0.5%Bupivacaine)	31	13.14%
2.0-2.5	205	86.86%
Total	**236**	**100.00%**
Elective C/S (n=102)	16	15.67%
Emergency C/S (n=134)	36	26.86%
Total (N=236)	**52**	

Table 3: No. of attempts at SAB and the Prevalence of PDPH

No. of ATTEMPTS	ABSENCE OF PDPH	PRESENCE OF PDPH
1 – Once (n=123)	109 (88.62%)	14 (11.38%)
2 – Twice (n=84)	55 (65.48%)	29 (34.52%)
3 - Three Times (n=19)	12 (36.16%)	7 (63.84%)
4 - Four Times (n=8)	6 (75.00%)	2 (25.00%)
5 - Five Times (n=2)	0 (0.00%)	0 (0.00%)
Total (236)	**52**	

Table 4: Needle sizes used and prevalence of PDPH

NEEDLE SIZE (Quincke)	ABSENCE OF PDPH	PRESENCE OF PDPH
23G (n=43)	33 (76.74%)	10 (23.26%)
		27 (23.28%)
25G (n=51)	44 (86.27%)	7 (15.67%)
26G (n=26)	18 (69.23%)	8 (26.93%)
Total (236)		

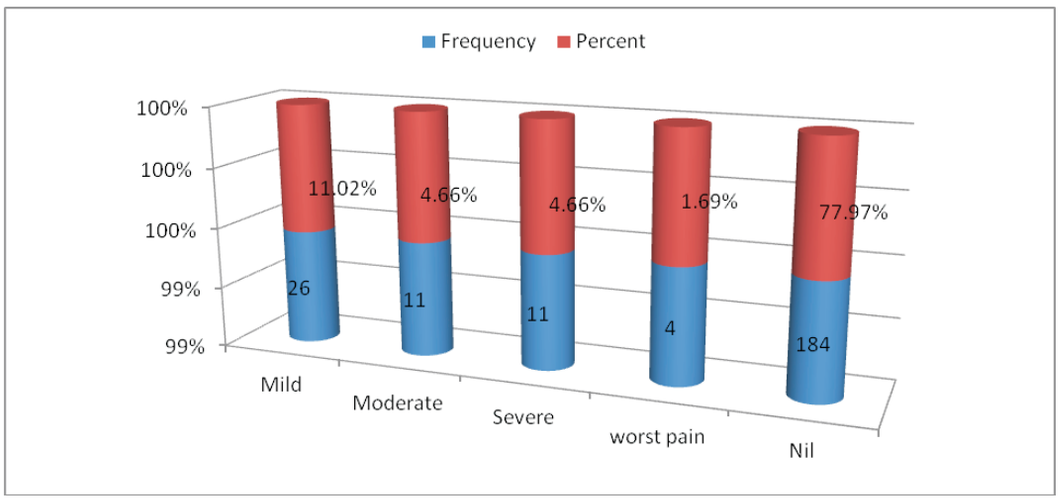

Figure 1: General Frequency & Severity of PDPH

DISCUSSION

In recent times the number of CS done under SAB has surpassed that done under general anaesthesia. This is because of the increased in mortality and morbidity associated with general anaesthesia; 84% of Caesarean sections in the UK are said to be performed under neuraxial anaesthesia (i.e. spinal, epidural or combined spinal/epidural).[2] Lumbar puncture for spinal anaesthesia is done under aseptic conditions, but it is not devoid of complications.[20] Post-dural puncture headache continues to be a significant cause of morbidity in parturients. Characteristically, the headache is severe, usually distributed over the frontal and occipital areas, radiating to the neck and shoulders. The pain is exacerbated by head movements and assuming an upright position.[12]

In this study, the general prevalence of PDPH was 22.03% which is considerably higher than previous studies.[5,17,18] This is probably due to the fact that only Quincke cutting tipped needles were available and the sizes used were larger. Headaches associated with PDPH are relieved by lying down and occasionally it may last for one week, but has been reported to persist for one year.[10] Many articles quoted that more than 85% of PDPH will resolve on its own without treatment.[12] If headaches persist for more than 24 hours, then treatment must be instituted. In our study, 37 (75%) parturients developed headache of mild to moderate intensity and was resolved with treatment. In other studies most of their patients who developed PDPH were successfully treated with conservative methods without resulting to the use of epidural patch.[18,19]

Factors like female, young age, pregnancy, low body mass index, multiple dural puncture, inexperience operators and past medical history of chronic headache, predisposes these patients to PDPH.[9] This might have played a role in the higher prevalence of headaches as the patients in this study were female, parturients and all were of younger age. Additionally, inexperience might also had played a role as almost all the cases were done by young nurse Anaesthetists as the State Specialist hospital does not have physician Anaesthetists (though Consultant Anaesthetists from the neighbouring Teaching Hospital operate on visiting capacity). We also observed that the prevalence of headache was higher in parturients that had emergency CS. Emergencies that presented in the hospital were done during call periods and those usually on ground to take the cases are of the junior cadre; this probably contributed to the high prevalence. Fifty seven percent of the Caesarean Sections in our study were done as emergencies which was similar to another study done in India.[21]

It is a known fact that the number of attempts appreciably increases the prevalence of PDPH. Multiple holes in the dura mater will cause more CSF leakage which will result in the development of

post spinal headache. One hundred and thirteen (47.9%) of the patients had lumbar puncture attempted more than once. Consequently, we want to believe that inexperience and poor technique might had also played a vital part in this thus leading to a higher prevalence of headache.[22,23]

There is a relation between the incidence of the PDPH and the needle size and type. Gorgaten et al, [24] found an incidence of 75% with 16-18G needles, 30% incidence with 22G needles and the incidence decreased to 0.3% with 27G pencil-point needles. Patients in whom the Quincke type of needle was used had considerably higher prevalence of headache compared to those whose spinal anaesthetics were administered with the pencil point needle.[25,26] In this study, all the needles used were of the Quincke-type hence, the significantly high prevalence

In view of the high incidence of PDPH prophylactic treatment might be a way out as pencil-typed needles are expensive and hardly available in the developing countries like ours. In 2010, Apfel et al, [27] published a quantitative on the strategies to prevent PDPH in a reputable anaesthesia journal. The methods reviewed included epidural morphine, prophylactic epidural blood patch, intrathecal catheter, epidural saline, and intrathecal saline. This review found that the use of epidural morphine significantly reduces the development of PDPH.[12]

CONCLUSION

The prevalence of PDPH was 22.03% in our study. This may be attributed to the use of traumatic Quincke-type needles and the fact that larger needles were used in 67% of patients. Deliberate efforts must be made to reduce its occurrence by acquiring of small calibre needles and training staff to use it.

LIMITATIONS: In the study we had to rely on information from colleagues as we were unavoidably absent during some of the procedures.

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