

ORIGINAL ARTICLE

Finding Factors Causing Postdural Puncture Headache In Obstetric Patients After Spinal Anaesthesia

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ABSTRACT:

Objective: Among various recognized factor of spinal headache the single most important causative factor is size of spinal needle. The aim of this study was to determine incidence of spinal headache with 27 G Quincke Babcock spinal needle in Caesarean section patients.

Materials and Methods: This observational cross sectional study was carried out in the Combined Military Hospital Gujranwala and Pakistan Naval Shipping Rahat Hospital Karachi from Jan 2011 to Jan 2013. In 500 Caesarean section (C section) cases preloaded with 1000 ml Ringers Lactate, 27 G Quincke Babcock spinal needle was used in sitting as well as left lateral position for spinal anaesthesia in all patients using local anaesthesia plain lidocaine 2% 1-2ml. In interspace L 2-3 / L3-4 either Bupivacaine hydrochloride hyperbaric 0.75 % or 0.5% was injected. All Caesarean cases were included except contraindicated. Spinal needle Quincke Babcock 27 G alone was used. The results were presented in percentages, mean and standard deviation.

Results: A total of 500 patients of c-section were evaluated. Overall incidence of true spinal headache was 2%, failed spinal anaesthesia 4%, spinal needle was changed in 3 %, success rate of 96 % and maternal acceptance 47.4 %. Single pricks were 59.4 % while 2-3 pricks were 40.6 % .

Conclusion: Smaller spinal needle has changed the safety profile of spinal anaesthesia in C section cases by very low failure rates and true PDPH a rarity. PDPH will continue as long as dura is punctured but incidence can be decreased by different techniques.

KEY WORDS: Spinal anaesthesia, Spinal needle, Caesarean section, Postdural puncture headache (PDPH).

INTRODUCTION:

Spinal anaesthesia is widely accepted technique for Caesarean sections¹ revolutionizing the practice by providing fewer complications since its discovery in 1885 by J Leonard Corning². The ease of performance, quick onset of dense block rendering excellent analgesia has surpassed other techniques for obstetric anaesthesia in terms of its benefits but PDPH after subarachnoid (SAB) block is the greatest fear which has contributed to search for optimum spinal needles and drugs. The obstetric anaesthesia care accounts for approximately 12 % of American Society of Anesthesiologists (ASA) Closed Claims database where post dural puncture headache was third in claims^{3,4}.

It is pertinent to note that headache is diagnosed clinically and causation is multifactorial but size and shape of spinal needles is mostly blamed. These needles have been modified to simplify their use and minimize complications. Needle design variables, such as diameter, tip design and orifice location, have been altered to enable rapid flow of cerebral spinal fluid (CSF) and injected medications, yet simultaneously limit dural trauma and loss of CSF. The CSF leak is one proposed mechanism which induces reflex vasodilatation and traction on cranial contents⁵. This leak is directly proportional to dural hole which in

turn is directly proportional to needle size. Parturient age and gender are inevitable contributing factors in spinal anaesthesia⁶.

A popular needle in practice is 25 G Quincke Babcock with a reported PDPH incidence of 25%⁷. Needles like 29 G and 30 G are available but their use is limited due to high failure rate and technical difficulty^{8,9}. The selection of needle is personal preference but 25 G is generally accepted. The use of pencil point needles was suggested very early by Hart and Whitacre for reducing dural trauma¹⁰. Various studies have demonstrated that pencil point and smaller bore needles are beneficial^{11,12}. The smaller needles have no or minimum incidence of PDPH at the cost of common technical errors like failed spinal and bending of needle. We have conducted this study to search a needle which is easy to use, readily available, fewer complications rate and economical.

MATERIALS AND METHODS:

This cross sectional observational study of 500 C section cases was conducted in Combined Military Hospital Gujranwala and Pakistan Naval Shipping Rahat Hospital for 3 years by a single anaesthesia specialist using only 27 G Quincke Babcock spinal needle. After prior approval of hospital ethical committee and written informed consent, the procedure was explained and local anaesthesia plain lidocaine 2% 1-2ml was injected in patients preloaded with 1000 ml of Ringers Lactate. Sensocaine (Bupivacaine 0.75 % 2 ml hyperbaric or Bupivacaine 0.5 % hyperbaric ml packing of Brookes Pharmaceutical Laboratories (PVT) Pakistan) or Abocaine (Bupivacaine 0.75 % hyperbaric 2 ml of Abbott Laboratories Pakistan) was used in L 2-3 / L3-4 level in sitting as well as lying positions. Free flow of CSF was confirmed before

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injection. All elective, emergencies, pregnancy induced hypertensive, primigravida, multigravida and obese cases were included in this study excluding unwilling and contraindicated patients. In emergency cases C-Fuser 1000 (medex, Dublin, Ohio 43016 USA) was used to preload the patients and ephedrine IV was titrated to control blood pressure. Nalbuphine IV 4-6 mg was given post delivery and Metoclopramide 10 mg IV for nausea and vomiting. O₂ was given with facemask at a rate of 4 liters if required and level of T4-6 was achieved before starting incision. After completion of surgery the patient was shifted to respective wards /intensive care advising complete bed rest for 24 hours. The PDPH incidence as defined by the international headache society criteria (Table 1) after the operation till 72 hours, change of needle to another 27 G due to bending, successful/failed spinal block and maternal spinal acceptance was noticed.

The data was collected and presented in percentages after analysis.

RESULTS:

A total of 500 patients were evaluated. Mean age of patients in the study was 28.5 years. Mean weight and height was 62 kg & 155 cm respectively. Majority of patients were multipara 337 and more than half (300) belonged to ASA grade 1. (Table 2)

Success rate in the study was 96 % with maternal acceptance rate of the procedure 47.4 %. Overall incidence of true spinal headache was found to be 2%. Failure of spinal anaesthesia was encountered in 4% of the patients. Spinal needle was changed in 3 % of cases. Majority of patients underwent single prick that is in 59.4 % while 2-3 pricks were needed in 40.6 % of the patients. (Table 3)

Table 1: International Society of Headache PDPH Criteria 12

Definition: Headache that develops within 7 days of dural puncture and disappears with 14 days.	
Classic Features but variable presentation	<ul style="list-style-type: none"> • Headache is often frontal-occipital • Most headaches do not develop immediately after dural puncture but 24-48 hours after the procedure with 90% of headaches presenting within 3 days. • Headache is worse in the upright position and eases when supine. • Pressure over the abdomen with the woman in the upright position may give transient relief to a rise in intra abdominal pressure (Gutsche sign)
Associated symptoms	<ul style="list-style-type: none"> • Neck stiffness, photophobia, tinnitus, visual disturbance and cranialnerve palsies.

Table2: Demographic Data

Age in years	28.5±11.5		
Weight in Kg	62±15		
Height in cm	155.486±7.62		
ASA grade	ASA 1	ASA 2	ASA 3
	300	120	80
Parity	Multigravida	Primigravida	
	337	163	

ASA: American Society of Anesthesiologist grade

Table 3: Outcomes of Spinal Anaesthesia

PDPH Incidence	2 %
Spinal Success Rate	96%
Spinal Failure Rate	4%
Maternal Acceptance	47.4%
Needle Changed	3 %
Single prick	59.4 %
2-3 Pricks	40.6 %

DISCUSSION

The search of optimum spinal needle had started since the invention of spinal anaesthesia but PDPH is reported with all needles. PDPH mechanism is not clear but CSF leak is clearly associated with this headache and CSF leak is directly proportional to needle size. The backache associated with spinal dural puncture has nothing to do in the long run except where some damage has been done during procedure. The backache solely associated with spinal anaesthesia in obstetric cases has been studied by Kashif and Arshad¹³ declaring that pre anaesthesia exam should include counseling about backache as the backache is not associated with this technique. However persisting chronic cases must be referred and epidural abscess or hematoma is excluded¹³. Pre anaesthetic history should exclude preexisting backache or nerve injury and many obstetric patients had preoperative backache which is multifactorial like change in centre of gravity and hormones.

Reportedly contributing factors for higher PDPH are needle size, type, entrance angle, technique, no of dural tap, multiple attempts by different users, pre existing backache history, trauma to structures especially periosteum and nerves. Other factor like age, weight, posture, patient's sensitivity to pain, spinal acceptance and previous experience are contributing to maternal satisfaction. Only PONV (post operative nausea and vomiting) and pain are best controlled in spinal anaesthesia whereas acceptance for regional techniques is very low. Similarly backache is there despite cause is not established and the maternal satisfaction is very poor¹⁴. Large bore (<25 or =25) and cutting point needles produce PDPH^{15,16,17,18} so their use must be discouraged. The needles of 27 G are studied extensively and approved in many studies^{19,20,21,22} but had variable PDPH incidence. Theoretically atraumatic pencil point needles provide advantages over cutting needles in the form of insignificant PDPH^{23,24}. The histological review on either needle had proved equivocal results of neurological damage/ inflammation²⁵. Our study is based on using 27G needle for spinal anaesthesia in all elective as well as emergency obstetric cases. In expert hands results with this needle in form of high success rate, low PDPH, good analgesia and fetal outcome are excellent but backache complaints are difficult to rectify. Psychological factors along with extent of structural damage are contributing.

CONCLUSION:

All efforts must be exercised for gentle atraumatic spinal anaesthesia in a single attempt or minimum attempts minus damaging nerve or bone. Smaller spinal needle has changed the safety profile of spinal anaesthesia in C section cases by very low failure rates and true PDPH a rarity. PDPH will continue as long as dura is punctured

but incidence can be decreased by different techniques. Furthermore adoption to this needle is required after practice as it is soft providing better dural puncture feel than larger bore needles. We strongly suggest all junior anaesthesia doctors to use this needle early in their career for better future practice outcomes.

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