



ORIGINAL RESEARCH ARTICLE

FAILURE OF SUBARACHNOID BLOCK IN CAESAREAN SECTION IN A TERTIARY HOSPITAL OF NEPAL GP Deo^{1*}, SK Shrestha¹, IN Shrestha¹, S Neupane¹, H Ojha¹, BS Regmi¹

¹ Department of Anaesthesiology & Critical Care, Chitwan Medical College, Bharatpur, Chitwan, Nepal

*Correspondence to: Dr Gopendra Prasad Deo, Department of Anaesthesiology & Critical Care, Chitwan Medical College, Bharatpur, Chitwan, Nepal.

Email: gopendradeo@gmail.com

ABSTRACT

Although subarachnoid block is regarded as the most reliable, easy and safe anaesthetic technique during caesarean section, the possibility of failure has long been recognized. So, other methods of anaesthesia have to be employed at times. This study was performed in all patients of ASA I and II who underwent caesarean section at Chitwan Medical college, Bharatpur, Chitwan, Nepal from BS 1st Baisakh 2069 to 30th Chaitra 2072 (13 April 2012 to 12 April 2016) to find the rate of failure of subarachnoid block in Caesarean Section and need of additional anaesthetic supplementation. The total number of patients included in study was 6641 with mean age of 24.2 years and range of 16-39 years. Sub arachnoid block was performed with 25 G Quincke spinal needle at L3-L4 or L4-L5 spinal levels and solution injected was 2.20 ml of 0.5% hyperbaric Bupivacaine. Of the total 6641 patients who received subarachnoid block, 9.9% (n=661) required additional anesthetic supplements. Conversion to general anesthesia was needed in 252 (3.79%) patients. Rest 6.15% (n=409) could be operated with administration of additional intravenous anaesthetic agents.

Key words: Caesarean Section, Failure, Subarachnoid block.

DOI: <http://dx.doi.org/10.3126/jcmc.v6i2.16679>

INTRODUCTION

Sub arachnoid block is generally regarded as one of the most reliable regional blocks, and is most commonly used anaesthetic technique for caesarean section. Both regional and general anaesthesia are used as anaesthetic technique for caesarean section and have their own advantages and disadvantages. General anaesthesia is associated with substantially greater maternal risk than sub arachnoid block (SAB) for caesarean section.¹ Most of the fatalities occurring in general anaesthesia are airway or aspiration related. Sub arachnoid block has simple technique, rapid onset time and produces excellent operating conditions and thus, making it more common in obstetric surgical practice.

MATERIAL AND METHODS

A retrospective study was carried out in all patients undergoing caesarean Section in Chitwan Medical College, Bharatpur from 1st Baisakh 2069 to 30th Chaitra 2072 BS (13 April 2012 to 12 April

2016). Ethical clearance from CMC-IRC was taken. All pregnant ladies with American Society of Anaesthesiologists (ASA) grade I and II were included in the study. Patients with functional status of ASA III or more or those contraindicated for Sub Arachnoid Block (SAB) were excluded from the study. All the patients were prehydrated with 500 ml of ringers lactate. Sub arachnoid block was given using 25 Gauze Quincke's spinal needle. Subarachnoid block was performed in L3-L4 or L4-L5 intervertebral space with patients in either sitting or lateral position with 2.2 ml of hyperbaric 0.5% Bupivacaine. The patients who did not complain of any discomfort and/or pain, no further analgesics or sedatives were given. Those patients who complained of significant discomfort and/or pain were given sedatives, alone or with analgesics or converted to general anaesthesia in escalating order, starting with intravenous (IV) midazolam 2mg as the initial agent and proceeding to addition of intravenous (IV) pentazocine 30mg and finally intravenous (IV) ketamine (20mg). Patient

still complaining discomfort and/or pain, general anaesthesia with endotracheal intubation was given.

General anaesthesia was induced with propofol, succinylcholine and was maintained with isoflurane and vecuronium. Pethidine was given for analgesia after delivery of baby and was reversed with glycopyrolate and neostigmine after completion of surgery.

RESULTS

The total number of caesarean sections done between BS 1st Baisakh 2069 to 30th Chaitra 2072 (13 April 2012 to 12 April 2016) in Chitwan Medical College, Bharatpur, Nepal was 6641. The caesarean sections performed in B.S. 2069, 2070, 2071 and 2072 were 1484, 1349, 1895 and 1913 respectively. The mean age of patients was 24.2 years with a range of 16 to 39 years. Out of 6641 patients, 661 (9.9%) patients complained of anxiety, pain and/or distress and required additional anaesthetic supplementation.

Table 1: Need of additional anaesthetic supplementation

Additional anaesthetic supplementation	n (%)
SAB+ IV Midazolam 2 mg	198 (2.98%)
SAB + IV Midazolam 2 mg + IV Pentazocine 30 mg	109 (1.64%)
SAB + IV Midazolam 2 mg + IV Pentazocine 30 mg + IV Ketamine 20 mg	102 (1.53%)
SAB + General Anaesthesia	252 (3.79%)

Out of 661, 409 patients required addition of anxiolytics and/or analgesics. 198 patients required only intravenous midazolam 2 mg while 109 required intravenous midazolam 2 mg and pentazocine 30 mg, which suggested majority were in state of anxiety and slight pain. The number of patients requiring general anaesthesia was 252 (3.79%). Table 1

DISCUSSION

Sub arachnoid block is most reliable regional block and has recently gained popularity for caesarean section. Simple insertion technique, cerebrospinal fluid indicating successful needle

placement, rapid onset, predictable effects with lesser and manageable complications, in contrast, potentially lethal complications related to airway and aspiration in general anaesthesia and the complexity of procedure and delayed onset of epidural anaesthesia have sub arachnoid block being technique of choice.² Common complications of Sub arachnoid block are hypotension intraoperatively³ and post spinal headache postoperatively which can be well managed in any clinical setting. Therefore, sub arachnoid block has fewer side effects, that can be easily managed and remains the preferred technique of anaesthesia for caesarean delivery. Despite of all the convenience, possibility of failure of Sub arachnoid block has long been recognized.⁴

Failure of subarachnoid block has been loosely defined. It has been defined as the need to convert into general anaesthesia.⁵ As per definitions, the failure rate was 3.79% in our study. In a similar type of study done by Shrestha AB, 5 found a similar failure rate of 4.3%.

Most of the experienced anaesthesiologist would consider the incidence of failure of sub arachnoid block (SAB) as low as 1%.

However, in a study done in an American teaching hospital by Levy et al,⁶ found 17% incidence of failure of SAB. His team studied 100 sequential spinal procedures, considering different variables like patient population, the technical aspects of performing subarachnoid tap and subsequent blockade and the level of training of the anesthetists. They found failure to be significantly associated with a lack of free flow of cerebral spinal fluid, the use of tetracaine without epinephrine, and an increased administration of intravenous supplementation and attributed mainly to technical reasons and mostly avoidable reasons.⁶

But in another survey, Munhall et al⁷ considered this (17%) as unacceptably high and mentioned a much lower, yet significantly high failure rate of 4.0%, quite comparable to our study of 3.79%. They studied 200 patients with tetracaine as the anaesthetic agent and attributed failure to both technical and pharmacologic factors. They mentioned 75% of failures to be due to errors in judgement with respect to pharmacologic factors (dosage, use of epinephrine, and/or positioning of the patient)

while 25% due technical errors. Similar findings of 3.6% and 3.2% failure rate were recorded in studies done by Shah et al⁸ and Fuzier et al⁹ respectively. In spite of combined spinal and epidural anesthesia being a better option specially for cases where haemodynamic compromise can be particularly concerning,¹⁰ spinal anesthesia still is a preferred choice of anaesthesia for caesarean sections for uncomplicated pregnancies.

Though sub arachnoid block is preferred method of anaesthesia for caesarean section, it is associated with failure. A proper extensive study is required to study all the factors related to its failure in order to reduce the failure rate and thus make sub arachnoid block method of choice for uncomplicated caesarean section.

REFERENCES

1. Hawkins JL, Koonin LM, Palmer SK et al. Anesthesia-related deaths during obstetric delivery in the United States. *Anesthesiology* 1997; 86: 277-84.
2. Fettes PDW, Jansson JR, Wildsmith JAW. Failed spinal anaesthesia: mechanisms, management, and prevention. *BJA* 2009;102(6):739-48.
3. Rout CC, Rocke DA, Levin J, Gouws E, Reddy D. A reevaluation of the role of crystalloid preload in the prevention of hypotension associated with spinal anesthesia for elective cesarean section. *Anesthesiol* 1993; 79: 262-9.
4. Labat G. *Regional Anaesthesia: Its Technic and Clinical Application*. Philadelphia, PA: WB Saunders Company, 1992.
5. Shrestha AB, Shrestha CK, Sharma KR, Neupane B. Failure of subarachnoid block in caesarean section. *Nepal Med Coll J* 2009;11(1):50-51.
6. Levy JH, Islas JA, Ghia JN, Turnbull C. A retrospective study of incidence and causes of failed spinal anesthetics in a university hospital. *Anesth Analg* 1985; 64: 705-10.
7. Munhall RJ, Sukhani R, Winnie AP. Incidence and etiology of failed spinal anesthetics in a university hospital: a prospective study. *Anesth Analg* 1998; 67: 843-8.
8. Shah NJ, Kheterpal S, O'Reilly M. A pilot study in failure rates for subarachnoid blocks in an adult surgical population. *Anesthesiol* 2006; 105: A875.
9. Fuzier R, Bataile B, Fuzier V. et al. Sub arachnoid block failure after local anesthetic injection into cerebrospinal fluid: a multicenter prospective analysis of its incidence and related risk factors in 1214 patients. *Reg Anesth Pain Med* 2011;36(4):322-6.
10. Rawal N, Schollin J, Wesstrom G. Epidural versus combined epidural block for caesarean section. *Acta Anaesthesiol Scand* 1988; 32: 61-6.
11. Riley ET, Cohen SE, Macario A, Desai JB, Ratner EF. Spinal versus epidural anesthesia for cesarean section: a comparison of time, efficiency, costs, charges, and complications. *Anesth Analg* 1995; 80: 709-12.