

Failure of subarachnoid block in caesarean section

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ABSTRACT

Subarachnoid block is the most convenient and safe anaesthesia during caesarean Section. But there are incidences where subarachnoid block does not work and other methods of anaesthesia have to be employed. This study was done in 2039 female patients who underwent caesarean Section at Paropakar Maternity and Women's Hospital, Thapathali, Kathmandu Nepal from 1st October 2005 to end of September 2006 to find the rate of failure of subarachnoid block in Caesarean Section and look for the causes of failure. Patients of age 17 years to 43 years (mean age 25.40 years) and ASA I and II were included in the study. Spinal needle (Sprotte^R) of 26 Gauge with Quincke's bevel was used. Solution injected was 2.20 ml of 0.5% hyperbaric Bupivacaine. Of the total 2039 patients who received subarachnoid block with the above mentioned methods, 6.0% (n=123) needed further anesthetic agents. Conversion to general anaesthesia was needed in 87 (4.3%) patients. Rest 1.8% (n=36) could be operated with further administration of intravenous agents (Ketamine, Diazepam and/or Pentazocine) only.

Keywords: Subarachnoid block, failure rate, caesarean section.

INTRODUCTION

Regional and general anaesthesia are commonly used for caesarean section and both have their own advantages and disadvantages.¹ General Anaesthesia for caesarean delivery is associated with substantially greater maternal risk than regional anaesthesia.² Most of the deaths occurring general anaesthesia are airway or aspiration related. Spinal and epidural anaesthesia have therefore become more common in obstetric surgical practice. Spinal anaesthesia is simple to institute, rapid in its effect and produces excellent operation conditions.

MATERIAL AND METHODS

A retrospective study was carried out in 2039 patients undergoing caesarean Section in Paropakar Maternity and Women's Hospital, Kathmandu for duration of one year (from 1st October 2005 to end of September 2006). Clinical records of patients undergoing caesarean Section were studied and analyzed. Healthy patients with American Society of Anaesthesiologists (ASA) grade I and II were included in the study. Patients failing to meet the criteria for ASA I and II and those with history of coagulopathy were excluded from the study. Spinal needle (Sprotte^R) of 26 Gauge with Quincke's bevel was used. Subarachnoid block was performed in L3-L4 intervertebral space with patients in either sitting or lateral position with 2.20ml of hyperbaric 0.50% Bupivacaine as the anaesthetic solution. Patients who did not complain of any pain or distress during the operative procedure were not given any other analgesics

or anxiolytic drugs. Those who complained of significantly pain and/or distress were given analgesics/ anxiolytics or other anaesthetic agents in escalating fashion. We started from intravenous diazepam 5mg as the initial agent and proceeded to intravenous pentazocine 30mg and finally ketamine (10mg to 20mg). Patients still complaining of pain and or distress even after these drugs were administered general anaesthesia via endotracheal intubation. The agents used for general anaesthesia were thiopentone sodium, succinylcholine for induction and halothane and pancuronium for maintenance.

RESULTS

The mean age of patients in the study was 25.40 years with a range from 17 to 43 years. Out of 2039 patients, 123 (6.0%) patients complained of pain and or anxiety/ distress. Out of this 123, 36 patients (1.8%) could be

Table-1: Need of further analgesics, anxiolytics or anaesthetic measures

Analgesic, anxiolytic or anaesthetic measures	n. (%)
SAB + Diazepam	4 (0.2%)
SAB + Diazepam and Pentazocine	9 (0.4%)
SAB + Diazepam, Pentazocine and Ketamine	23 (1.1%)
SAB + General Anaesthesia	87 (4.3%)
Total	123 (6.0%)

SAB: Subarachnoid Block

operated further with administration of intravenous analgesics and or anxiolytics namely intravenous diazepam, intravenous pentazocine and intravenous ketamine. The remaining 87 (4.3%) patients had to be converted to general anaesthesia. Following table summarizes the total patients who complained of pain and or anxiety/distress and needed further measures over and above spinal anaesthesia (Table-1).

DISCUSSION

Spinal anaesthesia has recently gained popularity for elective caesarean section³ above general anaesthesia and epidural anaesthesia. Potentially lethal complications related to airway and aspiration and the complexity of procedure of epidural anaesthesia have led anaesthesiologists to choose spinal anaesthesia as the method of choice for caesarean section owing to its procedural convenience, predictable effect, less complications and good patient compliance. Common complications of spinal anaesthesia are hypotension intraoperatively⁴ and post spinal headache postoperatively which can be well managed in any clinical setting. Therefore, spinal anaesthesia has few if any drawbacks and still holds a primarily preferred type of anaesthesia for caesarean delivery in many parts of developing world where there is lack of modern anaesthetic equipment and human resources.

Failure of spinal anaesthesia or subarachnoid block has been defined as the need to convert into general anaesthesia and taking that fact into consideration, our study shows failure of 4.3%. One study by Munhall *et al*⁵ mentions a similar failure rate of 4.0% in which 200 patients were studied with tetracaine as the anaesthetic agent. Failure has been attributed to both technical and pharmacologic factors. This study mentions 25.0% of failures to be due to errors in technique and 75.0% due to errors in judgement with respect to pharmacologic factors (dosage, use of epinephrine, and/or positioning of the patient). Similarly, another study done by Shah *et al* mention an overall failure rate of approximately 3.6%.⁶ But there was no significant difference in the failure rate between level of staff or patient position. However, one study mentions independent predictors like quality of anatomical landmarks, the provider's level of experience and the adequacy of patient positioning for a successful spinal anaesthesia.⁷

Study by Levy *et al*,⁸ done in 100 patients considering different variables like patient population, the technical aspects of performing subarachnoid tap and subsequent blockade and the level of training of the anesthetists found a 17.0% of spinal failure. Failure in this study was found 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. 41.0% of the failures represented errors in judgement, either in not properly anticipating the duration of surgery or injecting local anesthetic solution in the absence of free flow of cerebral spinal fluid. This high failure rate was mostly attributed mainly to technical reasons, most of them avoidable.⁸

Even though, administration of combined spinal and epidural anaesthesia is better choice specially for cases like pregnancy induced hypertension where haemodynamic compromise can be particularly concerning,^{9,10} spinal anaesthesia still holds a preferred choice for a vast number of caesarean sections for uncomplicated pregnancies.

Spinal anaesthesia for caesarean section therefore seems to be an excellent method of anaesthesia unless otherwise contraindicated. If the factors related to its failure are studied properly with an aim to reduce the rate of failure, it can prove to be an optimum method of anaesthesia for caesarean section. Therefore it demands more extensive prospective studies to be done in the future.

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