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ORIGINAL ARTICLE

Spinal Anaesthesia Failure Risk Followed by Failed Epidural Block in Caesarean Deliveries

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ABSTRACT

Background: There is a risk associated with spinal anaesthesia failure after immediate deliverance of epidural anaesthesia.
Objective: To assess the risk of spinal anaesthesia failure followed by failed epidural block in caesarean deliveries.
Study Design: Retrospective study
Place and Duration of Study: Department of Obstetrics & Gynaecology, Khairpur Medical College Khairpur Mir's from 1st July 2020 to 30th June 2021.
Methodology: One hundred and seventy labour cases who have been given epidural anaesthesia and were prepared for caesarean section through spinal anaesthesia were included. The demographic and clinical information of each pregnant female was documented. Proper epidural dosage was maintained during labour.
Results: The mean age of the patients was 26.5±5.2 years. There was a significant increase in body mass index among epidural converted spinal aesthesia patients. The higher incidence of non-reassuring foetal heart tracing and malpresentation in failure cases were found.
Conclusion: There is a 11.17% risk of spinal anaesthetics failure for attaining block height when administered within 30 min of epidural dose.
Keywords: Epidural, Spinal anaesthesia, Anaesthesia, Caesarean

INTRODUCTION

Epidural anaesthesia is one of the pain management anaesthetic techniques used in caesarean section. In many cases epidural is not adequate enough and requires additional doses of neuraxial anaesthesia for surgery. The rate of failure of spinal anaesthesia post epidural has been well reported in many researches with a risk of 1.7-19.8% failure.[1,2] The factors associated with escalating the risk of failure of epidural conversion into spinal anaesthesia includes proficient clinical care, urgent c-section requirement.[3]

It is important to understand that spinal anaesthesia is only performed in cases where already given epidural anaesthesia is not efficient as surgical anaesthesia during delivery. A localized anaesthesia provided in a single intra-thecal dose increases the risk of blocking. [4-6]. There are other researches contradicting this fact and elaborating that epidural-spinal anaesthesia is an efficient technique during c section.[7]

The reason for the failure of spinal anaesthesia after an epidural dose could also be due to confounding the epidural space filled with the local anaesthesia as a cerebrospinal-fluid during performance of spinal anaesthesia, consequently, resulting in the failure of it.[8] The other reasons could also be the dose reduction by the clinician to avoid high-block.[9,10]

The present study was designed to assess the risk of spinal anaesthesia failure post epidural block given during c-section delivery. An incidence estimate could providently provide the information regarding risk benefit analysis of this procedure for patient's safety and secure delivery.

MATERIALS AND METHODS

This retrospective study was conducted at Department of Obstetrics & Gynaecology, Khairpur Medical College Khairpur Mir's from 1st July 2020 to 30th June 2021 and 170 patients were selected. These patients were selected on the basis of their caesarean surgery requirement and were on epidural anaesthesia. Each patient's consent was taken consent, prior enrollment in the research. Demographic, gestational age, weight, height, BMI and clinical data were documented. Those patients where in a combined dose of spinal epidural anaesthesia was given as a result of inadequacy of labour epidural were included in the study, whereas patients having only spinal anaesthesia or an epidural anaesthesia were not included in the study. A team of well specialized anaesthetist was assigned with the gynaecologist for monitoring each patient. All epidurals during labour were managed with a series of infusion in addition to analgesic-epidural control with 0.125 percent bupivacaine solution and also with 2 μg·mL−1 of fentanyl. A failed-block or inadequate spinal anaesthesia was defined as the urge of further requirement of neuraxial/spinal anaesthesia for obtaining block-height. (In failed cases it was then achieved by converting from spinal to general anaesthesia within sixty minutes or obtaining required block height). The top up dose of epidural consisted of bolus: epidural-lidocaine greater or equal to 200 mg within a time range of 30 minutes prior to spinal anaesthesia. Data was analyzed using chi square, mean and standard deviations analyses tools from SPSS-24. p valu <0.05 was significant.

RESULTS

The mean age of the patients was 26.5±5.2 years (Table 1). Most common dosage of hyperbaric bupivacaine in spinal epidural cases used was 7.5mg. Failure was observed in 19 cases (11.17) out of 170 leaving 151 such cases with no blockage and failure (88.83%) [Table 2].

Comparing the age, BMI and gestational age of patients suffering from failure of spinal anaesthesia prior to epidural dose with those patients who had successful anaesthesia attempt it was seen that there was no significant variance among gestational age as well as age, however there was a significant increase in BMI among epidural converted spinal aesthesia patient's (p<0.05) [Table 3].

The present study also found a higher incidence of non-reassuring foetal heart tracing (NRFHT) and malpresentation in failure cases (p value <0.05) than non-failure cases. However, no change in preeclampsia occurrence rate was noticed among any of the patients (Fig. 1).

Table 1: Distribution of age among patients (n=170)

Variable	No.	%
Age (years)		
18-21	1	12.35
22-31	82	48.23
>31	67	39.41

Table 2: Distribution of failure rate among patients (n=170)

Failure rate	No.	%
Failure	19	11.17
Non-failure	151	88.83

P<0.05

Table 3: Comparison of failure and non-failure according to age, BMI and gestational age

Variable	Failure	Non-failure	P value
Mean age	25.5±5.1	27.5±5.3	0.05
Height (cm)	162±0.5	162±0.6	0.18
Weight (kg)	89.1±2.1	78±2.3	0.02
BMI (kg/m$^{2)}$	33.9±1.1	29.7±1.2	0.03
Gestational age (weeks)	38.2±1.0	39.0±0.9	0.43

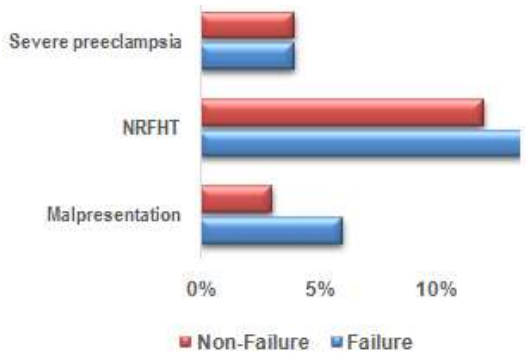

Fig 1: Comparison of severe preeclampsia, NRFHT and malpresentation among patients

DISCUSSION

Regional anaesthesia also called epidural or spinal anaesthesia is most commonly used to relief pain throughout birthing process concerns regarding the use and safety of epidural anaesthesia is already well documented.[10] Various theories has been reported to explain the mechanism most common of which is the compression of thecal sac that surrounds the spinal cord that result in dislodgment of intradural dose within cerebrospinal fluid.[7,11]

Database analysis proved that, administration of regional anaesthesia sometime leads to poor labour epidural, elevates the chances of block failure[12] as well as other complication as also seen in present study. Risk of block failure becomes higher if epidural topped-up within thirty minutes before spinal administration.[13-15] For the confirmation of proper spinal anaesthetic administration, there must be clear fluid flow from the needle tip.[16] Failed incidences of spinal anaesthesia which ranges from 10.1-19% maybe due to the existence of local anaesthetic within the epidural space that might interfere with cerebrospinal-fluid during epidural administration. To make this procedure more appropriate and for the confirmation of spinal anaesthetic administration, cerebrospinal fluid glucose test is used to make sure whether clear fluid in epidural space is residual local anaesthetic or not.[17]

Due to the ambiguity about the accurate dosage of regional anaesthetic and because of high concerns of failed/high blocks, administration of more than single dose of spinal anaesthetic would prove to be a preferred technique. Present study highlights that spinal anaesthetic administered after inadequate labour epidural increases the chances of failure.[18-20]

CONCLUSION

There is a 11.17% risk of spinal anaesthetics failure in attaining block height when administered post epidural in pregnant women. The failure cases have higher risk of obesity, NRFHT and malpresentation.

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