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ORIGINAL ARTICLE

Incidence of High Spinal after Institution of Spinal Anesthesia for Caesarean Section in Divisional Headquarter Teaching Hospital Mirpur AJK

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ABSTRACT

Background: The recognized side effect of spinal anaesthesia is a high or total spinal block. It might be challenging to define what a high spinal is. Clinical block that is far higher than what is needed for surgical anaesthesia may be deemed "high" block, although in the absence of serious consequences (such respiratory impairment or bradycardia), this would be seen as a physiologic outcome. Complete spinal block is not well defined. Complete or total anaesthesia refers to a block that extends above the cervical spine (such as brain stem and cranial nerves).

Objective: To identify the frequency of high spinal anesthesia in cesarean section parturients to improve the quality of spinal anesthesia in parturients and to prevent the possible morbidities, mortalities and ensuring efficient management of high spinal anesthesia.

Study Design: Cross-sectional study

Place and Duration of Study: Department of Anesthesia, Divisional Head Quarter Teaching Hospital Mirpur AJK from 1st June 2022 to 30th November 2022.

Methodology: One Hundred parturients for cesarean section of ASA-I were included. After pre-loading and following aseptic measures, spinal anesthesia was administered inrathecally to the parturients using Bupivacaine Spinal 15mg in L3-L4 intervertebral space in sitting position. After institution of spinal anesthesia, parturients were immediately brought to supine position and essential monitoring (SPO2, Heart Rate, Pulse, Blood Pressure) were attached. Generalized insignificant drop from baseline in BP, HR and Pulse was observed in parturients with exception of 4 parturients in which profound drop in BP, HR, Pulse and SPO2 was noticed indicating High Spinal Anesthesia. Level of sub-arachnoid block was confirmed by loss of temperature sensation (sensory block) by wet swab above T4 level. Immediate management which included oxygen supplementation, use of colloids (Gelofusine 500mL), slight reverse trendelenburg position, Atropine (Boluses of 0.5mg) and Phenylephrine (Boluses of 50-100mcg) was done as per protocol. In 5-10 minutes, parturients were stabilized and cesarean sections were allowed to be proceeded.

Results: The mean age of the parturients was 25.7±3.5 years with a range between 20 to 40 years. The majority of the cases were seen within the age group of 20-25 years followed by 26-30 years. Within this study it was observed that there were 32% of the parturients with a previous history of three A lower (uterine) segment Caesarean section (LCSC). It was observed that only 4% of the cases were having high spinal anesthesia within 100 cases enrolled while 2 cases reported in the increased age of 36-40 years. The incidence of high spinal anesthesia was pertinent in cases of oligohydramnios, IUGR and high head and poor bishop.

Conclusion: The incidence of higher spinal in parturients undergoing for cesarean section was very low.

Keywords: High spinal, parturients, Cesarean section. Spinal anaesthesia, Hypotension, Bradycardia.

INTRODUCTION

Pain is considered as an emotional as well as sensory reaction affecting various factors including physiological, cognitive, and behavioural outcomes.[1-5] During a health concern it is the biggest issue during post-operative care.[6-8] In developing countries, the management of post operative pain becomes crucial due to limited resources, and limited assessment of pain by the health professional and the patients pain education. In appropriate analgesics applications plays a major role in poor pain management leading to more agony and discomfort in patients.[9-11]

The popular analgesic methods include systematic and intrathecal opioids, anti-inflammatory drugs as well as regional-never blocks. The current advancement in research has guided to the formulation of multimodal analgesic which when combined with aforesaid analgesics results in synergistic relief in pain.[12]

Preceding studies have shared their results where the prevalence of post operative pain associated with cesarean section was 78.4 to 92.7% within various developing countries. This suggests an effective protocol generation for the relief of post operative pain related with cesarean. It is pertinent to note that inadequately managed postoperative pain can result in delay in recovery with high risk of hospital-based infections in mother and neonate. Poor managed pain post cesarean can cause medical complications including pneumonia, depression and deep vein thrombosis.[1-5,13] Research has also highlighted that incompetently administered pain post-caesarean section is correlated with enhanced incidence of chronic pain.[14]

Total spinal, also termed as high neuraxial blockade is considered as a central neuraxial techniques complication which can result in breathlessness and cardiac arrest. An increased number of incidents with high neuraxial block are globally reported in obstetrics resulting due to increased use of neuraxial anesthesia.[15-17] The frequency of a full spinal block is however still not known in the developing countries. This side effect following spinal anesthesia has a large number of case reports and a small number of case series. Complete or high spinal was not listed as a "major" problem in a sizable central neuraxial complication in various recent research.[17]

There is very limited work on prediction of the incidence of acute caesarean sections postoperative pain under spinal anesthesia. The present study was conducted to provide sufficient evidence to establish a fundamental relationship between the

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incidences of high spinal after spinal anesthesia for caesarean section.

MATERIALS AND METHODS

This cross-sectional study was carried out at Department of Anesthesia, Divisional Head Quarter Teaching Hospital Mirpur AJK from 1st June 2022 to 30th November 2022. The permission of trial research and data collection was taken from the Ethical Review Committee of DHQ Teaching Hospital Mirpur AJK. A written informed consent was obtained in the ward from parturients themselves prior to patient enrolment to the study Information about the aim of study, invasive or non - invasive procedures to be done, when necessary, potential benefits, risks and assurance of confidentiality of any given information and study results were offered to parturients. The other requested additional information was also provided by the study personnel. Patient enrolled in the study were followed-up to insure they receive appropriate care following the procedure. Parturients with any other pathologies were channelled properly for appropriate management and follow-up. All parturients have elective surgery, age from 20-40 years, weight 50-80 kg and ASA-I were included. The parturients with emergency surgery, age <20 years and >40 years, weight <50kg, >80kg and ASA-II-III were excluded.

All the record of the patient were kept under the supervision of researcher and the supervisor with the standard privacy rules and kept confidential. Parturients were informed about the benefit of their contribution in the research procedure directly or indirectly. The privacy and agreement were renewed when the data was used in other procedures by taking informed consent from participant. The data was not exposed during the whole study duration.

One hundred parturients for cesarean section, of ASA-I were included in the study. Parturients were counselled properly about the procedure and informed consent was taken along with airway and pre-op vitals assessment. After pre-loading (with Ringer Lactate/Normal Saline) and following aseptic measures (which included use of mask, cap, proper hand washing, use of sterile gloves and painting with povidone iodine solution followed by draping), spinal anesthesia was administered intrathecally to the parturients using Bupivacaine Spinal 15mg (0.75% with Dextrose Anhydrous 165mg as hyperbaric agent) in L3-L4 intervertebral space in sitting position. After institution of spinal anesthesia, parturients were immediately brought to supine position and essential monitoring (SPO2, heart rate, pulse, blood pressure) were attached. Generalized insignificant drop from baseline in BP, HR and pulse was observed in parturients with exception of 4 parturients in which profound drop in BP, HR, Pulse and SPO2 was noticed indicating high spinal anesthesia. Level of sub-arachnoid block was confirmed by loss of temperature sensation (sensory block) by wet swab above T4 level. Immediate management which included oxygen supplementation, use of colloids (Gelofusine 500mL), slight reverse Trendelenburg position, Atropine (Boluses of 0.5mg) and Phenylephrine (Boluses of 50-100mcg) was done as per protocol. In 5-10 minutes, parturients were stabilized, and cesarean sections were allowed to be proceeded. Data was collected and sent for analysis SPSS on version 26.0 wherein the chi-square test for analysis was applied with a p value <0.05 as significant.

RESULTS

The mean age of the parturients was 25.7±3.5 years with a range between 20 to 40 years. The majority of the cases were seen within the age group of 20-25 years followed by 26-30 years. The least number of parturients were observed within 36-40 years. A lower (uterine) segment Caesarean section (LSCS) is the most commonly used type of Caesarean section. Within this study it was observed that there were 32% of the parturients with a previous history of three LCSC followed by 30% of 2 scars apprehending that 62% of the parturients had more than one LCSC scars (Table 1).

The current study also highlighted the incidence of high spinal anesthesia within the total cases undergoing spinal anesthesia during cesarean section. It was observed that only 4% of the cases were having high spinal anesthesia within 100 cases enrolled (Fig. 1)

The incidence was marked as one case each within the age groups of 26-30 years and 31-35 years, while 2 cases reported in the increased age of 36-40 years. This increased incidence with age was significantly variant with a double incidence as the age increased above 35 years and with a p value of <0.001 (Fig. 2)

There were various clinical indications within the parturients who underwent spinal anesthesia. Within the total number of parturients the highest number of high head and poor bishop as well as oligohydramnios was observed followed by IUGR. The incidence of high spinal anesthesia was pertinent in cases of oligohydramnios, IUGR and high head and poor bishop (Table 2).

The fetal presentation observed showed the majority of the neonates to have a cephalic presentation with only 3% transverse and 9% breech (Table 3)

Table 1: Demographics of the enrolled parturients (n=100)

Variable	No.	%
Age (years)		
20-25	37	37.0
26-30	28	28.0
31-35	20	20.0
36-40	15	15.0
LCSC History		
Primigravida	20	20.0
Previous I Scar	18	18.0
Previous II Scar	30	30.0
Previous III Scar	32	32.0

Table 2: Clinical Indications observed in the enrolled cases

Indications	No.	Incidence of high spinal	P value
Cephalopelvic Disproportion (CPD)	1(1%)	-	-
Oligohydramnios	6 (6%)	1(1%)	<0.001
Polyhydramnios	3 (3%)	-	-
Intra Uterine Growth Retardation (IUGR)	4 (4%)	1(1%)	<0.001
High Head + Poor Bishop	5 (5%)	1(1%)	<0.001
Placenta Previa	1 (1%)	-	-
Others	80 (80%)	1(1%)	<0.001

Table 3: Fetal Presentation of the neonates born to the enrolled cases

Presentation	No.	%
Cephalic	88	88.0
Breech	9	9.0
Transverse	3	3.0

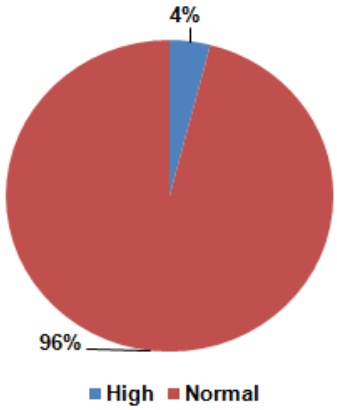

Fig. 1: Incidence of high spinal within total enrolled parturients

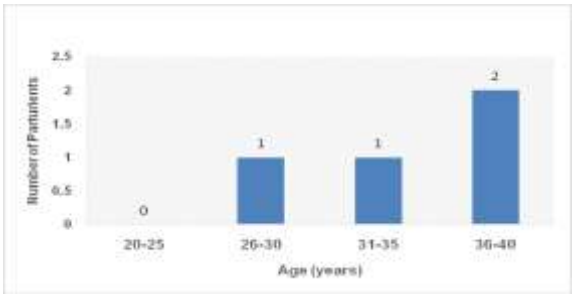

Fig. 2: Association of age with incidence of high spinal anesthesia

DISCUSSION

In this research, incidence of high spinal anesthesia in hundred parturients undergoing cesarean section in Divisional Headquarters Teaching Hospital was studied. Data was collected from parturients who were meeting the inclusion criteria which included; previous history of cesarean sections primigravida, previous I scar, previous II scars and previous III scars, cephalopelvic disproportion 'CPD', oligohydramnios, polyhydramnios, intra-uterine growth retardation (IUGR), high head, poor bishop, placenta previa and different fetal presentations. The following results with respect to each criteria were observed.[15]

Out of one hundred parturients, four parturients showed manifestations suggestive of high spinal anesthesia which further were divided into following age groups; in parturients of age group between 20-25, no incidence of high spinal was found. In parturients of age group between 26-30, 1 patient was found to be suffered by high spinal anesthesia. Similarly, in parturients between the age group 31-35, only 1 patient developed high spinal anesthesia. While in parturients with age group 36-40, 2 parturients developed high spinal anesthesia. Furthermore, regarding the age distribution of parturients, out of 100 parturients, 37 parturients were of age group 20-25, 28 parturients were of age group 26-30, 20 parturients were belonging to the age group 31-35 and 15 parturients belonged to the age group 36-40. Taking into account the previous cesarean sections, out of 100 parturients, 20 parturients were primigravida, 18 parturients operated for previous I scar, 30 parturients were operated for previous II scars and 32 parturients were operated for previous III scars. Common indications for cesarean section in the parturients were CPD in 1 patient, oligohydramnios in 6 parturients, polyhydramnios in 3 parturients, IUGR in 4 parturients, high head and poor bishop in 5 parturients and placenta previa in 1 patient. Fetal presentation in the hundred parturients was as follows; cephalic in 88 parturients, breech in 9 parturients and transverse in 03 parturients.[16-18]

It was observed that frequency of high spinal anesthesia is more common in the last age group(Age group 36-40) of our studied parturients, than the young parturients. Block height more dependent on dose than volume (higher dose gives higher risk). Cephalad spread is easy to manage using hyperbaric anesthetic agent. Higher BMI or abdominal girth including pregnancy may cause thecal volume to decrease and the risk of high block to increase. Anatomical or pathological features, such as a compressed thecal sac with dilated blood arteries and epidural fluid, might increase risk.[18,19]

A higher lumbar insertion may result in a higher final block. Sitting may reduce cephalad spread and hence reduced the risk. Direction of needle hole also plays role in spreading of anesthetic agent; cephalad direction will cause cephalad spread.[20]

CONCLUSION

The incidence of higher spinal in parturients undergoing for cesarean section was very low in our study. However, as this complication is life threatening, further studies are required to identify the factors playing role in the incidence of high spinal, so that, morbidity and mortality of obstetric parturients caused by this complication could be further reduced.

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