ORIGINAL ARTICLE

POST DURAL PUNCTURE HEADACHE AFTER SPINAL ANESTHESIA, COMPARISON BETWEEN 22 GAUGE AND 25 GAUGE WHITACRE SPINAL NEEDLES IN ELECTIVE CAESAREAN SECTION

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ABSTRACT

Objective: : To determine the incidence and risk factor of Post Dural Puncture Headache after Spinal Anesthesia in patients presented for elective caesarean section.

Material & Methods: This cross-sectional study was conducted at District Head-Quarter (DHQ) Hospital, Bathkhela. We used convenience sampling for sample collection in hospital. In this study, those patients were included who underwent Caesarean Section (CS) under spinal anesthesia at gynecology department of DHQ Bathkhela.

Results: A total of 198 patients were studied in which 32.3% (n=64) patients underwent spinal anesthesia with 22 gauge spinal needle while 67.7% (n=134) underwent spinal anesthesia with 25 gauge spinal needle. The overall occurrence of post puncture headache was 11.11% (n=22). The incidence of post puncture headache with 22 gauge spinal needle was 26.56% (n=18) while it was 2.98% (n=4) with 25G spinal needle.

Conclusion: This study suggested that the incidence of post puncture headache was higher with 22G as compared to 25 G Whitacre spinal needle.

Key Words Anesthesia, Cerebrospinal Fluid, Headache, Needle, Spine.

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INTRODUCTION

Subarachnoid Anesthesia technique delivers rapids and safe anesthesia for caesarean section. The Whitacre and Sprotte (pencil-point spinal needles) are reported to have a low frequency of post dural puncture headache (PDPH). [1,2] To give birth to a baby by caesarean-section, this may be described as the procedure through which a baby is delivered by a cut in the uterus and abdominal wall of a mother.[3] When spinal anaesthesia used for cesarean section, a mother experiences her child birth, stays awake during her child birth.[4] The one major complication of Spinal Anesthesia is PDPH that can occur after spinal anesthesia and with inadvertent dura matter puncture during epidural anesthesia. The headache may be associated by nausea, photophobia, tinnitus, hypoacusia and neck stiffness. [5] A German surgeon, Karl August Bier, first reported the PDPH in 1898.[6] Needle size might be the utmost significant influence in the development of PDPH.[7]

Development of headache within seven days after a dural puncture which exacerbates within 15 minutes of standing position and improves in the recumbent position in less than 30 minutes, might be PDPH.[8,9] When the headache persists and does not disappeared within 14 days after a dural puncture, then it is called a cerebrospinal fluid fistula headache.[9] Age, sex, pregnancy, history of PDPH, needle tip shape, needle size, number of lumbar puncture and needle angle to dura matter are the factors that can affect the incidence of PDPH. The correlation of spinal needle type and size with the incidence of post dural puncture headache was described as 75% for 16 to 18 gauge needles, 30% for 22 gauge quink needles and decreased to 0.37% for 27 gauge needles (Pencil-point). 25, 26 and 27 gauges spinal needles are the most favorable needle sizes for subarachnoid anaesthesia.[10]

Even though there have been known treatment methods for PDPH like administration of , sumatriptan, caffeine, theophylline, epidural

saline, dextran or autologous blood patch, maintaining CSF volume deserves thoughtfulness as a newer development in the prevention of PDPH.[11] A latest meta-analysis on seven trials (1101 patients) presented that lateral decubitus position during spinal anesthesia was related with main reduction of PDPH incidence.[12-14] The = two common methods used in spinal anesthesia are median and paramedian, each of which has advantages and drawbacks. The median approach is the most common technique used. But the paramedian approach is sometimes preferred because of fewer attempts at needle insertion and faster catheter insertion. A paramedian approach is thought to minimize the PDPH risk, but this has yet not been verified in clinical trials.[15,16] The highest incidence of PDPH after ambulatory diagnostic lumber puncture is 36% with a 20 gauge or 22 gauge quincke spinal needle.

The occurrence of PDPH is less than 2% with a 29 Gauge needle, 2-10% with a 26 G needle, 25% with a 25 G needle and 40% with a 20 G needle.[17] The incidence of PDPH is greater in 30 to 50 years age than that of 51 to 70 years aged patients.[18-20] To determine the incidence and risk factor of PDPH after spinal anesthesia in elective C-section was the main objective of the current study.

MATERIAL AND METHODS

This cross-sectional study was completed in duration of six months from July 2017 to February 2018 at District Head Quarter hospital Bathkhela. 198 participants participated in the study. Convenience sampling technique was used for collection of data, which is a non-probability sampling and describes those population who was easy accessible at time of sample collection. Subjects of age 28 to 38 years presenting for elective caesarean section under spinal anesthesia with 22-gauge and 25-gauge Whitacre spinal needles were included in this study while all cases age above 38 years and below 28 years, uses of spinal needle other than Whitacre were excluded from this study. Verbal consent was taken from each research respondent and only the agreeable subjects were included in this study. Ethical approval was obtained from KMU Institute of Paramedical Sciences Peshawar.

Reports were obtained from each research subject who fulfills the inclusion criteria and experts in the concerned department carefully check the reports to determine the presence of PDPH. SPSS version 22 was used for data analysis.

RESULTS

Total 198 participants were selected randomly through convenience sampling technique at DHQ Hospital, Bathkhela in the department of gynecology. Out of total particpants, 22 (11.1%) patients had PDPH while the remaining 176 (88.9%) had no PDPH. Then we divide these patients into groups “A” and “B”. Group A was consisting of 32.3% (n=64) patients while group B were consists of 67.7% (n=134) patients. A subarachnoid technique used in Group-A patients through 22 gauge Whitacre spinal needle, while in group-B patient’s 25 gauge Whitacre spinal needle was used.

In this study we made comparison of occurrence of PDPH between 22 gauge and 25 gauge Whitacre spinal needles. As we analyzed data and found that 22 gauge needle is associated with more incidence of PDPH and 25 gauge needle was less likely to occur PDPH. Out of total population of research subject, 64 patients underwent spinal anesthesia with 22 gauge spinal needle and the incidence with this type of spinal needle was 28.16% (18/64). Total of 134 patients was underwent with 25 gauge spinal needle, out of these, 4 patients appeared the PDPH which was 2.98%. This study was also based on the age wise incidence. The maximum aged patients studied were 38 years while least age patients included in the research were of 28 years. When we studied the target population of women we also found that the incidence of PDPH in young aged women was higher. Eight patients appeared the signs and symptoms of PDPH in 24 hours, seven patients appeared there signs and symptoms of PDPH in 48 hours while other 7 patients appeared there signs and symptoms within 2-3 days of post spinal anesthesia.

DISCUSSION

PDPH is considered as one of the serious and major problem after spinal anesthesia. In our study population two groups were made on the basis of spinal needle gauge used, Group A (comprising of patients in whom a 22 gauge Whitacre needle used for lumber puncture) and Group B (comprising of patients in whom a 25 gauge Whitacre needle was used for lumber puncture). The overall incidence of PDPH reported in this study was 11.11%, in the elective C-Section under spinal anaesthesia with 22 and 25 gauges Whitacre spinal needles. One of studies, on post dural puncture headache reported the incidence of 17.3% after spinal anesthesia in gynecological procedure. They also reported that the incidence of post-dural puncture headache may fluctuates from 0.1% to 36 percent, dependent on the type of needle, patient age and as well as gender.[17] The reason behind the difference with this study was due to shape of needle tip and needle gauge. We made

comparison of occurrence of post puncture headache in between 22 and 25 gauges Whitacre Spinal Needles (SN). The incidence of PDPH after spinal anesthesia performed with quincke, an cutting needle, is 36% with 22 gauge needle, 2% to 12% with 26 gauge needle, 25% with 25 gauge needle.[7,10,13] This large difference was due to the tip of the needle, as Whitacre (a pencil point needle, used in our study) is associated with less incidence of post puncture headache while using cutting, a quincke needle will make a large whole in the dura and should have more chances of occurrence of PDPH. A meta-analysis published in 2000 has compared the rate of incidence of PDPH between Quincke and pencil-point spinal needles (Whitacre and Sprotte), who found that the pencil-point spinal needles will suggestively decrease post-dural puncture headache rate when compared with Quincke spinal needles.[7]

During collection of data after taking history from the patients some of the patients were also found with pre-operative epidural analgesia with epidural catheter placement in the lumber region on the spinal, but there were no relation with the occurrence of PDPH. Our study suggested, that the frequency of PDPH was higher with 22 gauge as compared to 25 gauge, 28.16% and 2.98% respectively. This large difference in the incidence with these two different diameter spinal needles was due to the whole created in the dura matter. As increasing the diameter of the needle tip the whole in dura will also large and there will be more chances of leaking out of large CSF volume from puncture site which will reduce pressure and may significantly lead to PDPH. It means that when using large diameter spinal needle for puncturing of dura, the incidence will be higher, while use of less diameter spinal needle, incidence of PDPH will also decreases. Our research also suggests that the incidence was higher in young age parturient than that of higher age parturient.

CONCLUSION

This study concluded that the incidence of PDPH was higher with 22 gauge spinal needle as compared to 25 gauge spinal needle. Risk factors that we found in this study were young age group, large needle size as well as shape of needle tip.

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