

## **A comparison of 25 gauge Quincke spinal needle with 26 gauge Eldor spinal needle for the elective Caesarian sections: Insertion characteristics and complications**

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### **Abstract**

**Objective:** The study was designed to compare the insertion characteristics and incidence of PDPH between 25 gauge Quincke needle and 26 gauge Eldor needle for spinal anaesthesia in elective c/s.

**Method:** 60 pregnant women (aged 19-35yrs and weighing 58 –67kg) undergoing elective caesarean section were randomized into group A (Quincke spinal needle group) or group B (Eldor spinal needle group). Spinal anaesthesia was performed with 2.9 ml 0.5% heavy bupivacaine using 25 gauge Quincke spinal needle in group A and 26 Gauge Eldor spinal needle in group B. Onset, time of first identification of backflow of CSF, number of attempts, level of sensory and motor blockade, failure of anaesthesia, inadequate anaesthesia and incidence of PDPH were recorded.

**Result:** Quincke spinal needle was found easy at insertion, first attempt was successful in 90% of cases, whereas Eldor spinal needle was successful at first attempt in only 60% of cases. Early identification of CSF was seen in Eldor spinal needle group in 3.5 seconds vs. 5.2 seconds in Quincke spinal needle group. Blood mixed CSF was seen in 8 Quincke spinal needle group vs. none in Eldor spinal needle group. Onset was similar between both groups i.e. in 6 minutes. Failure of anaesthesia was none in Eldor spinal needle group vs. 2 in quincke spinal needle group. Height of sensory block achieved was T4 level in 26 parturients, T6 in 1, T8 in 1 and no anaesthesia at all in another 2 parturient as compared to T4 level in 29 and T3 in 1 parturient in Eldor spinal needle group. The degree of motor block with the use of Bromage criteria showed a motor score of 1 or 2 in 26 parturients in Quincke spinal needle group vs. same in all cases in Eldor spinal needle group. The total incidence of PDPH was 8.3 % ( 5 out of 60 parturient) which occurred all in Quincke spinal needle group. 2 parturient who developed severe PDPH required epidural blood patch.

**Conclusion:** 26 gauge Eldor spinal needle was found to be better than 25 gauge Quincke spinal needle for caesarian sections to decrease the incidence of PDPH, though not all insertion characteristics were in favour of the Eldor needle.

**Key Words:** Anaesthetic technique, spinal; equipment, spinal needles; complications, headache.

Spinal anaesthesia is one of the commonest techniques used in anaesthetic practice in caesarian sections nowadays. Though popular but still is not without any unwanted side effects and one of the common complications, PDPH is the drawbacks to the use of spinal anaesthesia for caesarian section. To minimize such problem, pencil point, conical tipped spinal needles like 26 gauge Whitacre, 24 gauge Sprotte and Green have become popular which are basically designed to spread dural fibres rather than cutting like Quincke. In the recent days anaesthesiologists are more concerned about providing qualitative service to the patients as well as getting used to new techniques, equipments, drugs. In the development process of spinal needles finer single holed as well as double holed spinal needles are introduced to minimize the incidence of PDPH. 26 gauge The Eldor spinal needle is also one of the

newly introduced needle aimed to reduce the incidence of PDPH in anaesthetic practice which is not only fine but has 2 round opposing holes at the tip through which local anaesthetic solution disperses uniformly and it is assumed that maldistribution does not occur so that inadequate anaesthesia also doesn't occur. Since it is also a pencil point needle, separating dural fibres rather than cutting it during dura puncture, the incidence of PDPH is assumed to be less. In our study the insertion characteristics and incidence of PDPH were compared between 25 gauge Quincke and 26 gauge Eldor spinal needles in elective caesarean section cases.

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## Methodology

After approval of the hospital ethics and research committee a written consent was obtained. 60 ASA I and II primi and multipara parturient undergoing elective caesarean section aged 19-40 years were randomly divided into 2 spinal needle groups i.e. (A=30) Quincke and (B=30) Eldor. All parturient were premedicated with Metoclopropamide 10 mg and Ranitidine 50 mg iv 2 hours before anaesthesia. They were preloaded with 1000 ml Lactated Ringers solution, spinal anaesthesia was performed with either 25 gauge Quincke needle or 26 gauge Eldor needle in sitting position and midline approach at L2-L3 or L3-L4 lumbar space using 2.9 ml of 0.5% Heavy Bupivacaine. During the procedure number of attempts, time of identification of first CSF flow, onset of SAB, level of sensory and motor block, adequacy and failure were noted. Similarly incidence of PDPH was also recorded.

*Exclusion criteria were:* parturient refusal, weight more than 75 kg, eclampsia / preeclampsia, bleeding disorders. Peri-operative monitors were heart rate, oxygen saturation, ECG and noninvasive blood pressure. Sensory level was measured with the use of temperature (by cold water swab) and motor block by using Bromage motor score,

(1=unable to move feet or knees), (2= able to move feet only), (3=just able to move knees), (4=full flexion of knee and feet). All the parameters were recorded immediately after spinal drug injection and till adequate anaesthesia was achieved (i.e. sensory level till T4, motor score of 1 or 2, complete absence of pain). In cases of failed Anaesthesia or inadequate Anaesthesia even after 15 minutes general anaesthesia was given.

All parturient were asked about headache for 6 consecutive days post operatively. Headache was considered as postdural puncture headache (PDPH) if it was experienced in frontal or occipital region, exacerbated on sitting or standing position and reduced or relieved by lying down and graded as mild (no limitation of usual activity and treated with oral analgesics and fluids), moderate (limited activity and oral analgesics and fluids required in large amount), severe (confined to bed, oral analgesics, fluids and epidural blood patch required).

## Results

**Table 1.** Demographic data between 2 groups

Spinal needle	Quincke (A)	Eldor (B)
Age(yrs)	19-33	19-35
Weight(kg)	58-67	50-65
Height(ft)	5'0'' -5'8''	4'7''-5'5''

**Table 2.** Number of attempts

Number of attempts	A	B
1	27	18
2	2	7
>2	1	5

**Table 3.** Identification of CSF between 2 groups

Time for first identification of CSF	A	B
	5.2 Seconds	3.5 Seconds

**Table 4.** Blood mixed CSF were more in group A as compared to B

Blood mixed CSF	A	B
	8	0

**Table 5.** Onset was similar between two groups

Onset	A	B
	6 Minutes	6 Minutes

**Table 6.** Height of sensory and motor blockade was comparable between 2 groups

Vol. of local anesthetic 0.5% heavy Bupivacaine	A		B	
	2.9 ml		2.9 ml	
Height of sensory block	28 (parturient)	T4	29 (parturient)	T4
	1 (parturient)	T6	1 (parturient)	T3
	1 (parturient)	T8		
Height of motor block (Bromage motor score)	26 (parturient)	1 or 2	30 (parturient)	1 or 2
	4 (parturient)	3 or 4		

**Table 7.** Quality of anaesthesia compared between 2 groups

Quality of anaesthesia	A	B
Adequate	26	30
Inadequate	2	None
Failure	2	None

**Table 8.** Incidence of PDPH in two groups

A				B
No. of PDPH	Onset	Severity	Blood patch required	
1	40 hrs	severe	Yes	none
2	30 hrs	moderate	No	none
3	18 hrs	moderate	No	none
4	26 hrs	severe	Yes	none
5	14 hrs	mild	No	none

### Discussion

Spinal anaesthesia is a very popular technique employed by a number of anaesthesiologists nowadays in caesarian sections because of rapid onset, decreased exposure of parturient and fetus to unnecessary high dose local anaesthetics, inhalation agents and narcotics. These advantages may be offset by a high incidence of PDPH that may require autologous blood transfusion and interfere with mother's care of her newborn, lengthens hospital stay thereby increasing total cost. To minimize such a complication a number of new fine pencil point non dura cutting spinal needles have been developed and used and one of them is Eldor spinal needle which is assumed to be an ideal spinal needle for certain group of patients where the incidence of PDPH is high.

Quincke spinal needle is easily available, commonly used and cheap but it has been found to have high incidence of PDPH. A study by Ross BK, Chadwick HS, Mancuso JJ and colleagues found that in 366 Obstetrics cases incidence of PDPH was 9% with Quincke 25 gauge needle and 8% with 26 gauge Quincke needle as compared to only 1.5% with 24 gauge Sprotte needle<sup>1</sup>. Hurley RG, Hertwig LM, Johnson MD, Dutta S found that incidence of PDPH in 396 Obstetric cases with 25 gauge Whitacre needle was 1.3 % vs. 5% with 26 gauge Quincke needle<sup>2</sup>. Mayer DC, Quance D, Weeks Sk compared 25 gauge Whitacre and 24 gauge Sprotte needles for elective

*caesarean section* and found that incidence of PDPH with the first one was 4% vs. 0.66% with the second one<sup>3</sup>. Ronald Hurley, Donald Lambert, Linda Hertwig, Sanjay Dutta in Brigham and Women Hospital in Boston, Massachusetts studied 4108 women receiving SAB for *caesarean section* or vaginal delivery from 1987-1991 with either 26 gauge Quincke spinal needle or 27 gauge Quincke needle or 25 gauge Whitacre and 17 gauge epidural needle and found that incidence of PDPH were subsequently 5.2 % ,2.5%,1.1% and 1.3%<sup>4</sup>. PuolakkaR, Haasio J, Rosenberg PH compared double hole(26 gauge Eldor) and single hole(27 gauge Pencan) needles for spinal anaesthesia with hyperbaric bupivacaine and found that there were no difference between the spread of anaesthesia but double holed needles were found more prone to tip damage from mechanical contact<sup>5,6</sup>.

In our study altogether parturient were 60, among which 30 got spinal anaesthesia with Quincke 25 gauge needle whereas rest 30 got spinal anaesthesia with Eldor 26 gauge needle. Demographic profiles were similar between both groups, onset and height of sensory and motor block were also similar. Single attempt was more successful in Quincke needle group than Eldor needle group and blood mixed CSF was evident only in Quincke needle group. Probably successful first attempt can be achieved with more and more use of Eldor needles. Regarding failure of anaesthesia, it was seen only in Quincke spinal needle group and which may be due to needle displacement during the time of injection but in the next two cases anaesthesia was found patchy even with the proper injection of drug where we even have to think of drug maldistribution. Regarding PDPH, incidence was high in Quincke spinal needle group and none in Eldor spinal needle group. Two parturients with severe PDPH were managed with epidural blood patch in the postoperative period.

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