



## INCIDENCE OF POST DURAL PUNCTURE HEADACHE FOLLOWING SPINAL ANESTHESIA IN CAESERIAN SECTION. A COMPARISON OF 25G QUINCKE AND 25G WHITACRE NEEDLE

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### ABSTRACT

Obstetrics patients are at increased risk for PDPH. It has the potential to cause significant morbidity in mothers. Aim of our study was to compare the incidence of PDPH with 25G Quincke and 25 G Whitacre needles in caesarian patients.

**MATERIALS AND METHODS:** After institutional ethical board approval and written informed consent, this prospective randomized study was done in our hospital. 100 ASA1 and 2 patients posted for caesarian were randomly divided in to 2 groups. Group 1, (n=50) received spinal anesthesia using 25G Quincke and Group 2 (n=50) using 25G, Whitacre needle. Incidence, severity and duration of head ache compared.

**RESULTS:** Eight (16%) patients in Quincke group and two (4%) patients in Whitacre group developed PDPH. But the difference in incidence of PDPH between the groups was not statistically significant. Difference in ease of insertion between needles in two groups didn't show any statistical significance.

**CONCLUSION:** Incidence and severity of head aches with Whitacre needle was less compared to cutting needle, though difference was not statistically significant. We conclude pencil point needles should be preferred for caesarian patients receiving spinal anaesthesia.

**KEYWORDS:** Headache, quinckes needle, Whitacre needle, Obstetrics, sub arachnoid block.

### INTRODUCTION

Spinal anaesthesia is a simple inexpensive widely practiced technique introduced by German surgeon Karl August Bier (1898)<sup>1</sup>. PDPH is a major complication following intentional or unintentional puncture of dura while performing neuraxial block. Obstetric patients are at increased risk for PDPH because of their age, sex, hormonal changes and wide spread use of neuraxial blocks in obstetrics<sup>1</sup>. It interferes with the mothers ability to take care of the baby and delayed discharge from the hospital. Modifiable risk factors for PDPH include size and type of spinal needles used. There are many studies comparing type and size of spinal needles and incidence of spinal head ache in general population, not many are there studying the incidence of PDPH in caesarian patients. The aim of our study was to compare the incidence of PDPH between 25G Quincke and Whitacre needle in caesarian patients following spinal anaesthesia. Secondary Objective was to compare the failure rates and ease of insertion between these needles

### MATERIALS AND METHODS

After hospital Ethical committee approval written informed consent was taken from 100 ASA1 and 2 patients, aged 20 to 38 years, posted for elective caesarian section. Mothers with preexisting psychosomatic disease, headache, backache, coagulation disorder, emergency procedures, foetal distress, eclampsia, hypersensitive to local anaesthetics were excluded from the study. A prospective randomized single blind study was designed.

Considering 80% power and 5% level of significance, total sample size of 100 with 50 patients in each group were selected, Patients were allocated to either of 2 groups, group 1 or group 2 based on computer generated randomization tables. Group 1 (n=50) received spinal anesthesia using 25G Quincke needle and Group 2 (n=50) received spinal anesthesia using 25G Whitacre needle. The Anaesthesia resident doing the post operative evaluation of the subjects was blinded to the type of needle used.

Patients were shifted to operation theatre in left lateral position. Monitors including ECG, Noninvasive blood pressure and pulse oximeter were attached followed by preloading with 20ml/kg crystalloids. Under aseptic precautions Spinal anesthetic was administered by an experienced resident at the L2-L3 or L3-L4

interspaces in lateral position using either 25G Quincke or 25G Whitacre needle.

Using the midline approach, the skin and subcutaneous tissue were infiltrated with 2 cc of 2% lignocaine and spinal needle was introduced perpendicular to the skin. The needle was always advanced with stylet firm in place and bevel turned laterally. 1.8 to 2 ml .5% hyperbaric Bupivacaine was injected in to the subarachnoid space after confirming CSF backflow. Patients were immediately made supine and level of sensory blockade was noted. Intensity of motor blockade was graded as per Bromage scale. Failure of spinal anaesthesia was defined as either inability to obtain free flow of CSF with three attempts or evidently inadequate anaesthesia for surgery 15 minutes after local anesthetic injection in to subarachnoid space. General anaesthesia was administered to patients in whom spinal anaesthetic failed to work. A note was made on the ease of insertion. The number of needle passes needed to obtain subarachnoid tap determined the ease of insertion. The ease of insertion was classified as easy (<2 needle passes) and difficult (>2 needle passes). Age, parity, ASA classification, height, weight, number of needle passes, volume of anesthetic used were recorded.

During the intraoperative period, the blood pressure and heart rate was maintained within the normal limits. Patients were seen daily from 1<sup>st</sup> to 7<sup>th</sup> day post operatively and later telephonic enquiries made. Day of onset and severity of headache was noted. Headache is considered as PDPH if it is mainly occipital, aggravated by sitting, coughing, sneezing or straining and relieved by lying flat. Patients were asked to grade the severity of headache on 100mm VAS scale where 0mm indicated no pain and 100mm indicated severe pain.<sup>2</sup> Patients with PDPH were treated with Oral/IV fluids, Bed rest and diclofenac. If not relieved Opioids like Pethidine was added to the regimen. At discharge patients were asked to report to the instructor if any of the symptoms develop later.

### STATISTICAL METHODS

Descriptive statistics were reported using mean  $\pm$  S.D. for continuous variables. Number and percentages for categorical variables. Chi-square test or Fisher's exact test was used to find the associations between the study groups with demographic and clinical variables as appropriate. Independent t test or paired t test was used to compare the means for the two groups. Probability

value less than 5% was considered as statistically significant observation.

**Table 1: Comparison of age, height and weight distribution in two groups of patients**

Variables	Group I	Group II	p value
Age in years	25.98±4.28	26.26±4.13	0.740
Height in cm	158.54±4.86	160.12±4.40	0.0907
Weight in kg	63.66±5.07	61.51±3.40	0.014
ASA 1	88.0%	98.0%	
ASA 2	12.0%	2.0%	

ASA distribution is statistically similar between two groups with p=0.112

There were 44(88%) ASA I patients and 6(12%) ASA II Patients in group I and 49(98%) ASA I patients and 1(02%) ASA II Patients in group II.

**Table 2: Comparison of ease of insertion**

Ease of insertion	Group I		Group II	
	No.	%	No.	%
A	48	96.0	46	92.0
B	2	4.0	4	8.0
Total	50	100.0	50	100.0
Inference	<i>Ease of insertion is statistically not significant between two groups with p=0.678</i>			

**Table 3: Comparison of Failure rate**

Failure rate	Group I		Group II	
	No.	%	No.	%
Total	1	2.0	4	8.0
Total	50	100.0	50	100.0
Inference	<i>Failure rate is statistically not significant between two groups with p=0.362</i>			

**Table 4: Comparison of Incidence of PDPH**

PDPH	Group I		Group II	
	No.	%	No.	%
Yes	8	16.0	2	4.0
No	42	84.0	48	96.0
Total	50	100.0	50	100.0
Inference	<i>Incidence of PDPH is statistically not significant between two groups with p=0.092+</i>			

**Table 5: Comparison of duration of PDPH**

Duration of PDPH	Group I (n=8)		Group II (n=2)	
	No.	%	No.	%
<24	3	37.5	1	50.0
24-48	5	62.5	1	50.0
Severe	0	0.00	0	0.0

In group I, 3 patients had PDPH for <24hours and 5 had for 24-48 hours and in group II, 1 patient had PDPH for <24 hours and 1 had for 24-48 hours. None of the patients had PDPH for >48 hours.

**DISCUSSION**

Cesarean section under spinal anaesthesia is popular as it has several advantages over general anaesthesia<sup>7</sup>. Major worrying complication is Postdural Puncture Head ache. Obstetric patients are vulnerable in view of young age, lower intra-abdominal pressure following delivery which promote extra leakage of CSF, stress of labor, changing hormonal level etc..The incidence of PDPH is estimated to be 0% to 5% following spinal anaesthesia in parturients<sup>3</sup>. Low CSF pressure is caused by CSF loss through the dural puncture hole and failure of choroid plexus to secrete sufficient fluid to maintain CSF pressure. This CSF hypotension leads to intra cranial venous dilatation leading to increase in brain volume in sitting position This increase in brain volume will exert traction and stimulate pain sensitive structures like dural vessels, basal dura

and post dural puncture head ache<sup>1</sup>. Most important modifiable factors like, type and size of the needle, bevel orientation have important role in causing PDP

100 ASA I and II patients undergoing Spinal Anesthesia for LSCS were included in the study. Patients were randomly divided into two groups with 50 in group I (25G Quincke needle) and 50 in group II (25 G Whitacre needle). These 2 groups were compared with respect to ease of needle insertion, incidence, severity and duration of PDPH, backache and failure rate. Demographic data like age, and height were similar in both groups. Statistically significant difference in weight between two groups was not clinically relevant as the difference in mean weight and standard deviation is very narrow between the two groups.

In our study lumbar puncture was difficult in 4% in group I and 8% in group II. This difference in ease of insertion was not statistically significant. More than two needle passes were considered difficult insertion.

Balg T et al<sup>4</sup> in a study of 60 pregnant patients for cesarean section compared 25 g cutting and non-cutting needles which showed no statistically significant difference in ease of insertion.90%in Quincke and83%in Whitacre group had a first pass success<sup>4</sup>. This result was in agreement to our study.

Aarathi BH et al<sup>5</sup> in a study of 150 women undergoing caesarean section compared 27G Quincke, 27G Sprotte needle and 27G Whitacre needles with regard to ease of insertion. Successful lumbar puncture following single attempt was 76% with 27 G Quincke needle and 76% with 27G Sprotte needle and 68% with 27G Whitacre needle. None of these figures were statistically significant. Aarathi et al in her study noticed that ease of insertion was better with the use of introducer needles especially for fine gauges and failure rate is similar between cutting and noncutting spinal needles<sup>5</sup>.

In our study, incidence of PDPH was 8(16%) in group I(Quincke) and 2(4%) in Group II(Whitacre). The difference in incidence of PDPH was statistically not significant between the two groups. Balg.T reported an incidence of 36% in 25G Quincke and 6.7% in 25G Whitacre needle in obstetric patients. The difference was statistically significant Tahoor et al<sup>6</sup> reported an incidence of 5% with 25 g Quincke and nil in 25g Whitacre needles in a study done in 80 obstetric patients for caesarean section .The difference was not statistically significant. Shah A et al<sup>(1)</sup> reported an incidence of 20% PDPH with 25G Quincke and 4.5% PDPH with 27G Whitacre needle This is in agreement with our study where the difference is statistically insignificant.

In our study 7 patients experienced PDPH on 3<sup>rd</sup> postoperative day and one patient on 4<sup>th</sup> day among group I patients. In group II, 2 patients experienced PDPH on 3<sup>rd</sup> postoperative day. In a study by Shah A et al all patients had mild head ache with onset within 48 hours. In our study none had PDPH for more than 48 hours. All the 10 patients who had PDPH both in group I and group II were of mild severity. All patients from either group responded to treatment. None of them required epidural blood patches.

Pain at the injection site has been reported to occur in the early postoperative period. In our study, 2% patients in group I and 6% patients in group II had transient backache. Pain in lower back is the most frequent postoperative complaint following spinal anaesthesia with a reported incidence of 2-25%.Post operative back ache can be multifactorial like prolonged duration of surgery, positioning, underlying musculoskeletal disorders, type of surgery etc. In our study, the failure rate was 2% in group I and 8% in group II. The difference was not significant. In all failed cases general anaesthesia was given. In a study by Aarathi et al<sup>5</sup> the failure rate was 0, 8% and 2% with Quincke 27G, Sprotte27G and 27G Whitacre needle respectively. The difference was not statistically significant. These results are in agreement with our study<sup>5</sup>.

## CONCLUSION

To conclude spinal anaesthesia with 25 G Whitacre needle showed a lower incidence of PDPH in cesarean patients compared to 25 G Quincke needle, though the difference was not statistically significant. Pregnant patients who are at a greater risk than general population would benefit greatly from Whitacre needle. Incidence of technical difficulty and failure rate was more with 25G Whitacre needles, the difference was not significant

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