Original Article

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Post Dural Puncture Headache in LSCS: A Comparison of 25g Whitacre with 25g and 27g Quincke Spinal Needle

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Abstract

The object of this study was to evaluate the effect ofgauze and type of spinal needle in causing post dural puncture headache (PDPH) in parturient undergoing LSCS. Seventy five parturient ASA grade I and grade II , age 20-35year with singleton uncomplicated pregnancy, who were randomized into three group I, II, and III received spinal anaesthesia using 25G quincke, 27G quincke and 25G whitacre needle respectively. Patients were interviewed on first, second, third and fourthday , after surgery, and were questioned with regard to incidence of headache, its severity, location, character, duration and associated symptoms like nausea, vomiting, auditory, ocular symptoms, and backache.The observations were analyzed by chi square and student t test. Statistical significance was assumed when p was <0.05. Incidence of PDPH was 20% in group I, 12% in group II and 4% in group III, which was not statistically significant. Among patients who developed headache, majority of patient had mild generalized headache. Most of patients develop PDPH on first postoperative day. Although the incidence of headache was statically similar among three groups, but clinically the headache was lesser in patients who received subarachnoid block with 25G whitacre spinal needle is compared to 25G quincke and 27G quincke spinal needle. 25G whitacre spinal needle is appropriate to minimize post dural puncture headache in cases of caesarean section.

Keyword: PDPH; Spinal Anaesthesia; LSCS.

Introdution

Spinal anaesthesia is more widely practice anaesthetic technique in caesarean section. The main advantages of this technique are it is simple to institute, rapid in onset, require minimum apparatus and small volume of drug, patient remain conscious during surgery, maintain airway, reduces risk of aspiration pneumonitis, and require minimum post-operative care & post-operative analgesia. It also avoids foetal as well as maternal risk of general anaesthesia. Since the introduction of spinal anesthesia, headache is remained a well recognizediatrogenic complication. So we had undertaken this study to evaluate the effect of type and gauze of the spinal needle on PDPH in parturient undergoing LSCS under spinal anaesthesia.

Method

After approval from hospital ethical committee, this study was carried out on 75 parturient ASA grade I and grade II aged 20-35years with singleton uncomplicated pregnancy who were undergoing LSCS under spinal anaesthesia.

Written consent was taken from each patient. Patients were randomly divided into three groups of 25patients each.Group I patients received SAB with 25G quincke spinal needle, Group II patients received SAB with 27G quincke spinal needle,and Group III patients received SAB with 25G whitacre spinal needle.

Patient, those having more than one attempt to achieve CSF flow, history of convulsion and bleeding disorder, previous history of headache, backache, toxaemia of pregnancy, CVS/CNS disorder, neuromuscular disorder (myopathies, neuropathies) patient on anticoagulant therapy and vertebral anomalies were excluded from the study .

All the patient were screened preoperatively. On arrival of the patients in the operation theater, venous line was secured with 18G cannula and patients were kept in supine position with wedge under right hip to maintained left uterine

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displacement. Then ECG three leads, noninvasive BP & pulse oximeter attached through multipara meter monitor. Patients were preloaded with 500c.c Ringer lactate solution prior to administration of spinal anaesthesia. Under all aseptic precaution, spinal anaesthesia was given in sitting position at L2-3 or L3-4 inter space,with disposable spinal needle according to group allocated.Quincke needle was introduced with bevel direction parallel to sagittal plane of the dural fibers. When free flow of CSF was started 2.25 - 2.5ml of 0.5% heavy bupivacaine was introduced into the intrathecal space, and betadine dressing was applied at the puncture site. Then patient was turned to her back with left uterine displacement with wedge under right hip.

Soon after performing central neuraxial block intraoperative BP and Pulse were recorded. Level of sensory block was assessed by pin prick method. Motor blockade was assessed by modified Bromage motor scaleColloid and blood was transfused according to the blood loss. Complications like hypotension, bradycardia, nausea, vomiting and respiratory depression were treated accordingly. Hypotension and bradycardia were denoted in this study, when BP and pulse were decreased 20% of the base line value. Vitals were recorded every one minute during first 10min.,after that every 5 min. till completion of surgery.

Patients were interviewed on first, second, third and fourth postoperative day about the incidence of headache, its severity, location, character, and duration, associated symptoms like nausea, vomiting, auditory, ocular symptoms, and backache. For blinding patients were interviewed by another anaesthesiologist who were unaware about the type and size of needle used.

The headache that occur after mobilization, mostly localized in occipital, frontal or generalized, aggravated by erect or sitting position and coughing, sneezing or straining and relieved by lying flat is considered as PDPH.

Severity of headache was assessedaccording to Crocker's 4point scale

1. Mildheadaches which permitted long period of sitting/erect position and no other symptoms.
2. Moderate headache, which made it difficult for the patient to stay up right for more than half an hour,occasionally accompanied by nausea, vomiting, auditory and ocular symptoms.
3. Intense headache which immediately occur upon getting up from bed, alleviated while lying horizontal in bed often accompanied by nausea, vomiting, ocular and auditory symptoms ,and
4. Severeheadache that occurred even while lying horizontal in bed and greatly aggravated immediately upon standing up, eating is impossible because of nausea and vomiting.

Statistical analysis was done using chi square tests and student t test and p was <0.05 was considered as significant.

Patient, who developed PDPH treated with bed rest, inj. Diclofenac 75mg IM and adequate hydration.

Result

The groups were comparable in with respect to age, weight and height (Table 1).

The incidence of PDPH in all the three groups was statistically insignificant (Table 2). Onset of headache was varies from first to third postoperative day in all three groups (Table 3). Majority of patients develop generalized headache, while two patient in group I developed frontal headache (Table 4). All patients in three groups who developed headache had grade I (mild) headache, none of them had moderate to severe headache (Table 5). Headache was subsided within 24hours in most of the patient but it was lasted upto 48hours in 3 patients in group I (Table 6). Patient who had headache were treated with analgesic and hydration. None of the patient required epidural blood patch.

Table 1: Demographic data

	Group I (n=25)		Group II (n=25)		Group III (n=25)	
Age (yr)	23.0	± 3.31	23.6	± 3.17	23.4	± 3.67
Height (cm)	156	± 3.7	157	± 4.05	155	± 4.28
Weight (kg)	59.2	± 4.66	60.8	± 4.61	60.28	± 5.15

Values are mean ±SD

Table 2: Incidence of post dural puncture headache

Duration	Group I (n=25)		Group II (n=25)		Group III (n=25)	
No headache	20	(80%)	23	(88%)	24	(96%)
Headache	5	(20%)	2	(12%)	1	(04%)

Table 3: Onset of headache

Post OP. Day	Group I (n=25)		Group II (n=25)		Group III (n=25)	
1st Day	1	(4%)	2	(8%)	0	-
2nd Day	2	(8%)	0	-	1	(4%)
3rd Day	2	(8%)	0	-	0	-
4th Day	0	-	0	-	0	-

Table 4: Location of headache

Location	Group I (n=25)		Group II (n=25)		Group III (n=25)	
Frontal	2	(8%)	0	-	0	-
Occipital	3	(12%)	2	(8%)	1	(4%)
Generalized	0	-	0	-	0	-

Table 5: Severity of headache

Serverity	Group I (n=25)		Group II (n=25)		Group III (n=25)	
Mild	5	(20%)	2	(8%)	1	(4%)
Moderate	0	0	0	0	0	0
Intense	0	0	0	0	0	0
Severe	0	0	0	0	0	0

Table 6: Duration of headache

Hours	Group I (n=25)		Group II (n=25)		Group III (n=25)	
<24 Hrs.	2	(8%)	2	(8%)	1	(4%)
25 - 48 Hrs.	3	(12%)	0	0	0	0
> 48 Hrs.	0	0	0	0	0	0

Discussion

General anaesthesia for performing caesarean section is associated with increase chance, of complications. Therefore, the spinal anaesthesia is the method of choice for caesarean section.But the PDPH is an iatrogenic complication of spinal anaesthesia. Postdural puncture headache is defined as a headache that occurs after dural puncture and has a significant effect on the patient's postoperative well-being. The headache is postural and continuous for more than 24 hours at any level of severity or intensity and unable the patients to maintain upright posture.

The overall incidence of this distressing complication of post dural puncture headache has varied from 0.00% to25.00%, as reported by various authors. If the PDPH is taken lightly and not treated properly, maternal morbidity and mortality may occur. Therefore anaesthesiologist should know about this complication and its preventive methods.

The most important factor contributing to the higher incidence of PDPH was the gauge and type of needles used. Higher the gauge or thicker the needle, more traumatic type of (cutting type) needle, more the incidence of post spinal headache [1,2].

There is considerable evidence that the PDPH is due to low CSF pressure consequent upon seepage of CSF through the dural puncture hole and choroid plexus is unable to secrete sufficient fluid to maintain the CSF pressure [3]. Moreover the negative pressure in the epidural space may draw CSF from subarachnoid space. The magnitude and rapidity of CSF is lost and the rate at which it is reformed governs the incidence, rapidity of onset and severity of headache.

Cerebrospinal fluid leaking from the duralhole produces low CSF pressure that leads to intra cranial venous dilatation resulting in an increase in brain volume . Venous dilation and compensatory increase in brain volume will result in brain sag which in turn will exert traction and stimulate pain sensitive anchoring structures like dural vessels, basal dura and tentorium cerebella, causing post spinal headache [4].

Larger the hole in dura mater more will be the leakage of CSF and longer the time required for repair. The numbers of holes are also made a difference in the loss of CSF. It takes about two weeks or more for the holes to seal.

Parturients are particularly more prone to PDPH than other female patients because of the younger age less than 40 year and reduction of both the intra-abdominal and epidural pressure after delivery. Thereby promoting extraleakage of the CSF than usual. Other factors for increased incidence of headache are hormonal changes,stress of labour and dehydration.

Design of needle tip is most important factor.The tip of the pencil point needle separates the longitudinal dural fibers and arachnoid without producing serious injury. When the needle is withdrawn the fibers return to a state of close approximation. The cutting needle tip cuts out longitudinal fibers of dura even when the bevel is parallel to the fibers [5].

Reina M.A. et al. observed that when the needle was inserted with its bevel parallel to the axis of the dural sac in fresh cadavers the size of the dura-arachnoid lesion was 0.032 mm^2 in the epidural surface and 0.037 mm^2 in the subarachnoid surface of the dural sac. When the needle's bevel was perpendicular to the axis the measurement of the lesion size was 0.042 mm^2 for the external surface and 0.033mm^2 for the internal.

In a meta-analysis byRichman JM et al. indicates that with use of a cutting needle, insertion in a parallel fashion may significantly reduce the incidence of PDPH.

In the present study, bevel of the needle was inserted parallel to the longitudinal dural fibers in all the patients where quincke needle was used. So that narrow opening is obtained without much damaging the dural fibers, thereby decreasing the CSF

leakage.

Adequate hydration is recommended before applying the spinal block by various authors states that dehydration increased the severity of the PDPH, whereas the incidence was unaffected [6]. However in present study all patients were preloaded and adequately hydrated, so this factor did not contributed in headache development.

In our study, once the patient had headache, they were instructed to take complete bed rest. All patients who had PDPH received Inj. Diclofenac sodium IM (75 mg) 8 hrly and hydration therapy with 5% dextrose 500 cc. as additional fluid with in a period of one hour. All the patients responded with this treatment and did not complain of headache after 24 hrs, except three patientswho required a similar pattern of treatment for another 24 hrs. None of the patients required epidural blood patch.

Although the difference was statistically insignificant, the 25G Whitacre (pencil point) spinal needle caused a lower incidence of PDPH than the 27G Quincke (cutting type) spinal needle.

Thus we concluded that 25G Whitacre (pencil point) needle is appropriate spinal needle to minimize Post Dural Puncture Headache in cases of cesarean section.

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