CASE REPORT

Post dural puncture headache in children: A report of two cases

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ABSTRACT

Postdural puncture headache (PDPH) in children has rarely been registered, but some recent studies indicate that children may also develop headache after lumbar puncture.

We report two cases of PDPH that occurred in male children aged 6 yr (20 kg) and 10 yr (25 kg) who received subarachnoid block under sedation for herniotomy using 27 G Quincke spinal needle at L4-L5 space with 0.5% hyperbaric bupivacaine at a dose of 0.3 mg/kg. They developed typical postural headache after 24 hr & 48 hr respectively. They were successfully managed with complete bed rest, forced hydration, coffee drink twice, oral analgesics; and were discharged uneventfully. We conclude that now a days spinal anesthesia is being used in children and PDPH can occur in this population which can be treated on same lines as in adults. We believe that parents need to be informed about PDPH as there is inability of children to verbalise this pain.

Key words: Postdural puncture headache, pediatric spinal anesthesia, complications of spinal.

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INTRODUCTION

Lumbar puncture (LP) is performed in children for diagnostic tests, intrathecal medications and for spinal anesthesia[1]. Until the last decade it was believed that postdural puncture headache (PDPH) was an uncommon complaint in children, but recent studies highlighted that pediatric population may develop PDPH[2,3]. The prevalence of headache may be underestimated among children because it is often difficult for them to express their headache and other complaints. However, it is documented that children aged 3 years or older are able to describe their headache and even younger children may show signs of headache[3,4].

On literature search, cases of PDPH in children have not yet been reported from Indian subcontinent. We are reporting two cases of PDPH that occurred after 24 hr in a 6 yr male and after 48 hr in a 10 yr male child who received spinal anesthesia for herniotomy and were successfully managed. Etiopathogenesis, clinical features and line of treatment of PDPH in children are also discussed.

CASE REPORT 1

After taking informed consent from parents, a 6 yr old male child weighing 20 kg was taken for right sided herniotomy. Preanesthetic examination and routine investigations were unremarkable. Patient was fasting since overnight and was preloaded with 200 ml Ringer lactate. For premedication, midazolam 0.75 mg, glycopyrrolate 0.1 mg, ondansetron 2 mg i.v. were given. Monitoring included noninvasive blood pressure (NIBP), electrocardiography (ECG) and pulse oximetry (SpO_2). Ketamine 30 mg i.v. was given (as sedation), to prevent any movement of patient during subarachnoid

block (SAB). Right lateral position was given with a pillow (folded towel) under the shoulder. SAB was given taking aseptic precautions with 0.5% hyperbaric bupivacaine 6mg (1.2 ml) in L4-L5 interspace using 27G Quincke spinal needle (spinocaine adult size) in a single attempt. After SAB he was turned supine. Surgery lasted for 60 min uneventfully. During surgery O_2 was given with ventimask; BP, HR and SpO_2 remained in normal range and received total 400ml RL. Propofol infusion 50μg/kg/min was given for sedation. At the end of surgery 50 mg diclofenac suppository was inserted per rectally. He was conscious, obeying verbal commands and shifted to postoperative ward. On evening round he was comfortable, vital parameters were normal, showed complete recovery from spinal anesthesia and was discharged (day care surgery). On next morning (after approximately 24 hr of SAB), he reported with complaint of moderate intensity headache located in frontal region, which was aggravated by sitting posture. On examination it was found that except postural headache, there was no associated complaint of vomiting, neck rigidity or localizing signs, and was diagnosed as a case of PDPH. He was admitted and immediately i.v. infusion of RL 500 ml was given over 2 hours and was advised to take plenty of fluids orally, coffee drink twice, tab. ibuprofen 200mg TDS, complete bed rest (without pillow for 24 hr).He was observed for next 48 hr and did not have any complaint of headache; was able to move pleasantly and discharged home uneventfully.

CASE REPORT 2

A 10 yr old male boy of 25 kg, having right inguinoscrotal swelling was scheduled for herniotomy. After taking informed consent from parents he was given spinal anesthesia in the same way as for previous child. SAB was given with 1.5 ml (7.5 mg) of 0.5% of hyperbaric bupivaciane using 27 G Quincke spinal needle in L4-L5 space. Surgery lasted for 60 min uneventfully, total fluid given was 450 ml of RL, vital parameters remained normal. He was also discharged in the evening.

On day 3rd (after 48 hr of SAB), patient complained of headache in parieto- occipital region which aggravated in sitting position and relieved by lying down. He reported to surgeon and was referred to anesthetist. On examination only headache was present with no associated sign or symptom and was labeled as PDPH. He was treated on same lines as described in previous case-1. After 48 hr he was allowed to ambulate and discharged uneventfully.

DISCUSSION

Spinal anesthesia in children was first studied by August Bier in 1899. Since then spinal anesthesia was known to be practiced for several years with a series of cases published as early as in 1909-1910.[5] After some years, it fell into disuse because of the introduction of various muscle relaxants and inhalational agents and was almost unused after World War II. In the last decade, spinal anesthesia started being advocated again by many centers due to increasing knowledge on pharmacology, safety and monitoring in children.[6]

By International headache society, PDPH is classified in the group of headaches due to low CSF pressure. It is a headache that improves when the patient is supine and worsens with sitting upright. Its onset is after a lumbar puncture, and most occur within the first 3 days following the procedure.[7] Patients usually have complaint of a throbbing or dull pain in a fronto-occipital distribution. However, this pain can later generalise, with radiation into the interscapular region. Any movements that increase the intracranial pressure (such as coughing, sneezing, straining or ocular compression may exacerbate symptoms. Associated symptoms may include nausea, vomiting, ache or stiffness in the neck. Visual changes (photophobia, diplopia, blurred vision) and auditory changes (hyperacusis, vertigo, tinnitus, ataxia, hearing loss) are not uncommon.[8]

Regarding etiopathogenesis of PDPH, traction theory suggests that it is caused by persistent leakage of CSF through a puncture induced dural rent that may result in the sagging of brain and meninges, thus causing traction on pain sensitive structures. Vascular theory suggests that loss of CSF activates adenosine receptor directly causing compensatory dilation of cerebral veins and venous sinuses resulting in strecthing of pain sensitive fibres in the cerebrum.[9] Nevertheless, if a patient complains of headache after lumbar puncture, the physician should not assume the diagnosis of PDPH, rather other differential diagnosis like meningitis, central venous sinus thrombosis (CVST), spinal hematoma, cortical cerebral venous thrombosis, intracranial subdural hematoma, benign intracranial hypertension, migrane and caffeine withdrawal headache should also be considered.[10]

Incidence of PDPH in adults has been reported ranging from 5% to 30%[9,10], whereas a literature review analysed 40 articles published on PDPH in children between 1990-2002 and concluded that occurrence of PDPH after lumbar puncture in children is rare.[11] But this is also true that diagnosis of PDPH in this age group

is very difficult. Wee et al[12] reported that among 97 children who underwent LP under GA no child aged upto 10 yrs developed a headache (0%). Of the children aged 10-12 yrs, 2 out of 17 developed a headache (11.8%) and in children aged 13-18 yrs 5 out of 10 developed a headache (50%). The incidence of PDPH is reported to be two to three fold higher after diagnostic lumbar puncture than after spinal anesthesia.[13] This difference was attributed to large needle gauge (20-22G) used in diagnostic punctures as compared to 25-27G used in pediatric spinal anaesthesia. Larger needles cause a more severe leakage of CSF resulting in a higher rate of postpuncture symptoms.[14] After diagnostic lumbar puncture, incidence of PDPH was reported to be 5-10%.[15,16] In contrast, PDPH rates after spinal anesthesia are reported to be very low. Ahmed et al[16] observed no case of PDPH among 78 children (0%) aged between 2-6 years undergoing spinal anaesthesia with 25G Quincke spinal needle. Punuch et al[17] also found that PDPH occurred in only 5 children among 1132 children aged between 6 months to 14 years (0.4%) after subarachnoid block. Ylonen et al[1] reported that incidence of severe PDPH which necessitated epidural blood patch in children was approximately 1 out of 750 spinal punctures for anesthesia with 25-27 G needles (0.1%). In our institution, in a year on an average 200 children are given spinal anesthesia with 27G Quincke spinal needle for various surgeries. Only these two cases were reported to us in last five years for PDPH indicating a very low incidence of PDPH in children after SAB.

In adults the pencil point needle tip has been associated with lower incidence of PDPH.In a recent randomised trial[18] the incidence of PDPH was 36% in the cutting needle group (Quincke,Atraucan) and 3% in the Whitacre group. Electron microscopy shows that pencil point tip actually causes more trauma. It is theorized that this increased localized trauma might initiate an inflammatory reaction that promotes healing at the puncture site,[18] whereas in children no difference in incidence of PDPH was reported using different types of needles (Quincke,Whittacre) and paraesthesia was observed more commonly in the Whitacre group (10%) than in the Atraucan group (2%).[9] Many emergency departments still use the cutting needles, possibly because the pencil point needles require more expertise to use and may be associated with a higher failure rate. We also used Quincke needle (27 G) in both of the cases.

Treatment of PDPH in children remain on the same line as adults.First line therapy consists of mild analgesics,bed rest and forced fluid therapy by mouth or intravenous route[1].Caffeine treatment supports the vascular theory of PDPH, as it inhibits adenosine receptors and therefore acts as a cerebral vasoconstrictor.[19] Cosyntropin is an adrenocorticotrophic hormone(ACTH) analog that stimulates the adrenal cortex to secrete glucocorticoids, mineralocorticoids and weak androgens; it activates adenyl cyclase with a resultant increase in intracellular cAMP. It increases CSF production through a sodium active transport mechanism as well as possibly increasing beta endorphins in the CNS, with a subsequent increase in pain threshold. The dose is 0.25-0.75 mg i.v., but its use has not been described in children.[20] If the symptoms are not relieved within a few days it is reasonable to consider epidural blood patch with 0.2-0.3 ml/kg and was found effective in children also.[1,21,22]

CONCLUSION

To conclude, we want to emphasize that though occurrence of PDPH is rare in children, it could be a complication that should be kept in mind after spinal anesthesia. Parents need to be informed about this as children may not verbalise it and assurance should be given that it can be treated.

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