

## INCIDENCE OF POST-DURAL PUNCTURE HEADACHE IN INDIAN POPULATION: A NEED FOR A RELOOK

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Received: 30 December 2015, Revised and Accepted: 26 January 2016

### ABSTRACT

**Objective:** Subarachnoid blockade or spinal anesthesia has been the standard anesthetic technique for many years for surgery below umbilicus in a fit patient. Post-dural puncture headache (PDPH) has been the cause of worry in such patients which may be sometimes debilitating and may prolong discharge times. As the current research points to 20% incidence of PDPH with the use of 23 gauge needles, we aimed to find out the actual incidence of PDPH in patients undergoing infraumbilical surgeries in our population. We also analyzed the severity of such a headache and the need of any other extra intervention.

**Methods:** A total of 126 consecutive non-pregnant patients posted for infraumbilical surgeries in the winter months were administered spinal anesthesia with 0.5% hyperbaric bupivacaine with 23 gauge quincke needle. The intra-operative management was according to the routine protocol. In the post-operative period in 12, 24 and 48-hr, incidence of a headache with (PDPH) and without postural variation was noted. Any other event was also noted.

**Results:** The mean and standard deviation of age in years was  $35.15 \pm 12.35$ . The incidence of PDPH was 9.5%: (n=12) the other type of non-postural, vague headache formed 8.7%. Even among the 12, 7 patients reported headache spontaneously while the other 5 reported only on questioning. All patients were comfortable by 72 hrs except one who had mild pain until 6<sup>th</sup> day. All patients except one were discharged according the other necessities and not postponed due to headache.

**Conclusion:** The incidence of PDPH is around 9.5% and none was severe. The patients should be questioned on the incidence of PDPH rather than waiting for spontaneous reporting. Seasonal variations in the incidence need to be explored. There is no need to struggle with smaller gauge needles in cases with technical difficulty in administering spinal anesthesia.

**Keywords:** Anesthesia, Spinal, Dural puncture, Headache.

### INTRODUCTION

Subarachnoid blockade or spinal anesthesia has been the gold standard method for many years for surgery below umbilicus in a routine fit patient. Since the introduction and invention of spinal anesthesia, the headache has remained a well-recognized common complication [1]. Post-dural puncture headache (PDPH) occurs because the cerebrospinal fluid (CSF) leaks out from the breach or a small hole that the needle has made in the duramater. This physical phenomenon causes the pressure to drop and causes tension on the cranial nerves to cause headache. This conforms with the characteristic feature of a postural headache associated to spinal anesthesia. The onset of PDPH varies from 24 hrs to 7 days. Usually, a persistent headache may be distressing to the patient along with prolonged discharge times [2]. A lot of treatment modalities including a complex epidural blood patch have been advocated. The use of large gauge needles is associated with increased incidence of PDPH, but the use of smaller gauge needle is associated with technical failures. There are also pencil point needles the use of which decreases PDPH [3]. Hence in this study, we wanted to know the exact incidence of PDPH after using 23 G Quincke needles.

### METHODS

A total of 126 patients belonging to American society of Anesthesiologists physical Status I and II between 18 and 60 years of either sex were selected for the study in a 3-month period. After getting approval from the Institutional Research Committee, cases posted for short or medium duration infraumbilical surgeries were taken up. The inclusion criteria included willingness to participate without any major morbid illness. Any known case of a migraine, tension headache were excluded A routine pre-operative checkup was

done as per protocol. In the operation theater, intravenous fluid as Ringer lactate was administered as preloading and it was continued according to the concerned anesthesiologist's decision. Any loss was adequately replenished. All patients were given spinal anesthesia with 0.5% hyperbaric bupivacaine to achieve the needed level with 23 gauge quincke disposable needle. All insertions were made with the bevel up. The number of attempts and difficulty in giving spinal anesthesia was recorded. The administration of anesthesia was done by an experienced anesthesiologist. At the end of surgery, all vitals were monitored. A proforma was given to a shift of staff nurses who were explained about the study. The patients reported headache and when severe were given paracetamol. The administration of analgesics for incision pain was different and given with needs, As soon as there was a complaint of headache, all patients were subjected to a postural change, made to sit for a minimum period of 15-minute as per International headache society guidelines to notice any worsening of pain. If it worsens within the time frame, it was defined as PDPH and entered. If there was no postural change, it was designated as other headache. If there was no complaint, all patients were enquired about the presence of headache and entered when they complained at least on questioning. The first and second were, respectively, called headache on spontaneous/questioning. The severity of headache was designated by a simple verbal system as shown in Table 1.

Any other event or side effects were noted in the proforma. The patients were followed for 4 days for any complaint. The sample size was calculated with a confidence level of 95%, a prospective population size coming for anesthesia as 500 in the 3 months, a proportion of 0.2 and a standard error of 0.33. The value was 110. Compensating for exclusions, a sample of 126 was selected.

**Table 1: Severity of headache**

| Score | Severity |
|-------|----------|
| 0     | Nil      |
| 1     | Mild     |
| 2     | Moderate |
| 3     | Severe   |

**Table 2: The different surgeries**

|                        |    |
|------------------------|----|
| Hernia repair          | 26 |
| Appendectomy           | 35 |
| Ovarian cyst excision  | 16 |
| Abdominal hysterectomy | 22 |
| Hemorrhoidectomy       | 18 |
| Excision of sac        | 9  |

## RESULTS

All the 126 patients completed the study. The mean age with standard deviation was 35.15±12.35 years. The male:female ratio was 71:55. The mean duration of surgery was 41.5±14.6 minutes. The surgeries were as shown in Table 2.

The incidence of headache was in 20 out of 126 patients out of which the classical PDPH was noticed only in 12 patients, i.e. 9.5%. Even among the 12 patients, only seven reported the pain as spontaneous, but in the other 5, it was after questioning about the headache. In only 2 patients out of 12 the score of PDPH was 2. None of the headache patient had a severity score of 3. As the severity was <3 in all the cases, there is no need for any invasive intervention. The most common onset time was 24 hrs. It was treated with routine analgesics preferably with caffeine and paracetamol. In one patient, there was vomiting and in another, the headache persisted for around 6 days with a score of 1, which delayed the discharge. There was no case in which the other clinical signs like hearing loss, tinnitus, vertigo, dizziness, cranial nerve palsies, visual disturbances, arm pain, and thoracic back pain. Except in three patients all were administered subarachnoid block in the first attempt. None of the patients who needed multiple attempts had headache.

## DISCUSSION

Karl August Bier, a German surgeon, injected cocaine 10±15 mg into the subarachnoid space of seven patients including himself and his assistant, Hildebrandt. All the seven patients described the symptoms associated with PDPH. Bier concluded that the headache was attributable to loss of CSF [4]. The incidence of post-dural puncture decreases with smaller size needles. Fatimah *et al.* [5] reported more than 20% incidence with 23 g needles. Even in Indian patients, in a comparative study of PDPH with various gauge needles, the size of the needles forms an important determinant but in our observation it was 9.5% while using 23 G needles. Even from these 12 patients (9.5%) 5 reported only after questioning which depicts the milder nature of the problem. None of our patients had a very severe headache, in our study, which implies that such use of large size needle may not be such detrimental. We conducted the study in winter when there may be variable hydration status. Such studies comparing the incidence of PDPH in different seasons are not present in literature. Turnbull *et al.* [6] have stated in their review that introduction of small size needles is associated with technical difficulty. But in our study, spinal anesthetic was administered in the first attempt in 123 out of 126 patients. This may be probably because of large size needles. Smaller gauge needles keeping in mind only PDPH may increase the number of attempts in difficult cases. This may definitely result in decreased overall satisfaction among surgical patients. The satisfaction of the patients with regard to the experience of anesthesia was not part of our study. There is a definite decrease in the incidence of PDPH to 0.1-1% with the use of 27 G needles. But in our case, it was 9.5 which is too high to neglect. Extremes of age were not included in our study as there are differing reported incidences of PDPH

in such cases [7]. The direction of the bevel also plays a role and we used the needle with bevel up in all the cases [8]. The incidence of PDPH is relatively high in obstetric spinal and hence we carefully selected non-pregnant patients [9]. The size and the possible equivalence of the incidence of PDPH cannot be equated with pregnant and non-pregnant patients. The experience of the anesthesiologist has a definite role in the incidence of PDPH and hence in our study this component was standardized [10]. Caffeine with acetaminophen [11] is the drug which is proved to be very effective and used by us. As a method of standardization, no patient was allowed to ambulate for the first 48 hrs. There is a definite incidence of headache other than PDPH in our study which was mostly unilateral without any postural variation. This was managed with parenteral ketorolac. There was only one case of vomiting which is against the earlier reports. Most of our patients received one or two doses of parenteral ketorolac and pentazocine as their main pain reliever for the surgery associated nociception. The limitation of the study is that being a simple observational study there is no comparative evaluation between the different sizes of needles.

## CONCLUSION

To conclude, the incidence of a post-dural puncture in non-pregnant adults with the use of 23 G quincke needle is 9.5% in Indian population. Even though the severity of headache was less in most of the cases, the incidence is too high to accept the usage of 23 G needles as a routine for spinal anesthesia. But in expected cases of technical difficulty in administering spinal anesthesia, 23 G needle may be considered as a viable option instead of struggling with smaller gauge needles. The variable incidence of PDPH during differing seasons need to be explored and compared in further studies. Patients should be questioned on the symptomatology of PDPH as there may be decreased spontaneous reporting.

## Proforma

Name:  
Age:  
Sex:  
Needle size:  
Anesthetic used  
Headache - spontaneous/On questioning  
Analgesics received and any other event.

| Time  | PDPH | Others |
|-------|------|--------|
| 0     |      |        |
| 12    |      |        |
| 24    |      |        |
| Later |      |        |

| Score | Severity |
|-------|----------|
| 0     | Nil      |
| 1     | Mild     |
| 2     | Moderate |
| 3     | Severe   |

Analgesics received and any other event

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