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Dr. Anita N Rao
Assistant Professor,
Department of Anesthesiology,
Srinivas Institute of Medical
Sciences, Mangalore,
Karnataka, India

A study of headache in post-dural puncture using various sizes of spinal needles

Dr. Anita N Rao

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Abstract

One of the most important and often practiced procedures is the post-dural anesthesia technique. Its very effective and has been extensively used in the Anesthesiology practice. Its use is mostly justified by the effectiveness and also the study of complications associated with it. So far the most common encountered complication is the headache and has been aptly named as the post-dural puncture headache. This is followed by the post-dural puncture which is a part of lumbar puncture procedure. This study was done for evaluating the incidence of PDPH following spinal anesthesia in the south West costal Indian population using various gauges of Quinckes spinal needle.

Keywords: Headache, dural, meninges, spinal needle

Introduction

One of the most important and often practiced procedures is the post-dural anesthesia technique. Its very effective and has been extensively used in the Anesthesiology practice. Its use is mostly justified by the effectiveness and also the study of complications associated with it. So far the most common encountered complication is the headache and has been aptly named as the post-dural puncture headache. This is followed by the post-dural puncture which is a part of lumbar puncture procedure. This study was done for evaluating the incidence of PDPH following spinal anesthesia in the south West costal Indian population using various gauges of Quinckes spinal needle. The post-dural headache terminology has been officially adopted in the International Classification of Headache disorders [1, 2]. However, use of the word post-dural has been criticized as confusing and probably inaccurate, resulting in the proposal of an alternate term, meningeal puncture headache (MPH), which readers may increasingly encounter. It is also important to acknowledge that references to "dural puncture" throughout the medical literature actually describe puncture of the dura-arachnoid and are more correctly termed and thought of as "meningeal puncture" Regional analgesia was first introduced in clinical practice by the German surgeon Karl August Bier (1898), who injected cocaine into subarachnoid space of seven patients, himself and his assistant, Hildebrandt [1]. Then, it became widely practiced to provide anaesthesia, especially for surgery below umbilicus. Regional anaesthesia (spinal, epidural or combined spinal and epidural) became the first line of choice in obstetric surgery. Its preference is because of its advantages over general anaesthesia. These advantages include: easy technique, rapid onset, simple performance, requirement of minimum equipment and monitors, little effects on blood biochemistry, optimum levels of arterial blood gases, conscious patients during surgery and maintenance of airway patency, less post-operative care and provide good analgesia [2]. Unfortunately, regional anaesthesia has some complications that may be severe enough to annoy the patient, surgeon and/or the anaesthetist. Post-Dural Puncture Headache (PDPH) has remained a well-recognized complication. PDPH does not occur in all patients who received lumbar puncture for diagnostic or anaesthetic reasons and is found to be more common after Caesarean Section (CS) in young parturients [3, 4]. For many years ago less refined and thicker spinal needles were being used and the incidence of PDPH was high [4-6]. But within the last three decades more refined and thinner needles of 25-31G have been used more often and the incidence of PDPH is reduced to be 0-5% [7]. Although it may be transient, mild PDPH may persist for hours or many weeks and can be severely incapacitating [2]. Previous studies have reported a reduced incidence of headache in young patients with the use of a 29G needle, with the

Corresponding Author:
Dr. Anita N Rao
Assistant Professor,
Department of Anesthesiology,
Srinivas Institute of Medical
Sciences, Mangalore,
Karnataka, India

incidence varying between 0% and 2% [7]. The present study was undertaken to compare the use of 23G, 25G and 26G Quincke point needles in three groups under spinal anaesthesia with regard to the frequency and severity of PDPH and the difficulty in performing spinal anaesthesia.

Aims and Objectives

Post-dural puncture headache using various sizes of spinal needles.

Materials and Methods

The study was conducted in Department of Anesthesiology, Srinivas Institute of Medical Sciences, Mangalore.

A total of 150 patients who were planned to undergo surgery under spinal anesthesia, and satisfying the inclusion criteria were enrolled into the study.

Inclusion criteria

- As defined by American Society of Anesthesiologists Physical Status I and II,
- Age between 25 and 75 years who are planned to undergo surgeries under spinal anesthesia.

Exclusion criteria

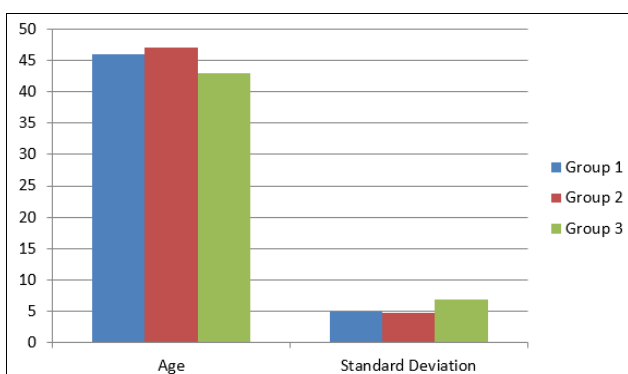
- Patients with previous history of PDPH, migraine, history of a chronic headache.
- With contraindications for spinal anesthesia.
- Multiple punctures for spinal anesthesia.
- Failed spinal anesthesia, poor follow-up.
- Patient refusal to give consent were excluded from the study.

Procedure

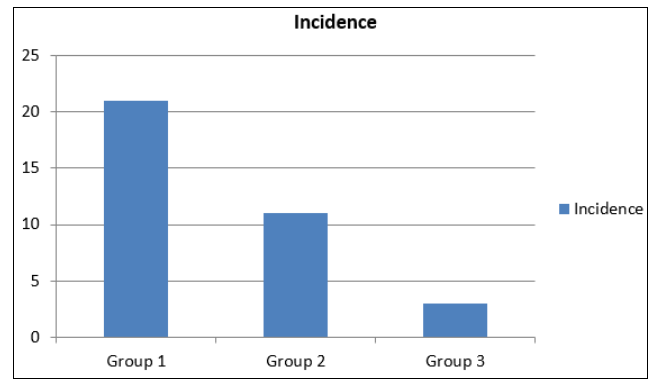
The study subjects were randomly divided into three groups, Group I, II, and III each consisting 50 patients. All patients were uniformly preloaded with intravenous ringer lactate 10 ml/kg and positioned in sitting position for lumbar puncture. Under all aseptic precautions, a lumbar puncture was made in the L3-L4 interspace using Quinckes spinal needle of size 23-gauge, 25 gauge, and 26 gauge, respectively, in patients belonging to Group I, Group II, and Group III. In all the study, subjects uniformly 0.5 ml of cerebrospinal fluid (CSF) was allowed to spill out before injecting the local anesthetic.

Patients complaining of the headache and satisfying the criteria for PDPH as laid out by International Society of Headache were diagnosed to have PDPH and treated accordingly. Moreover, the severity of headache was assessed using Cocker’s scale.

Result



Graph 1: Age distribution



Graph 2: Incidence of PDPH.

Table 1: Test for Significance.

Frequency	P value	Significance
21	0.0011	Not significant
11	0.483	Not significant
03	0.833	Significant

Discussion

Post-dural puncture headache (PDPH) is one of the most common complications encountered by physicians following spinal anesthesia or lumbar puncture [3-7]. This study was done for evaluating the incidence of PDPH following spinal anesthesia in the south Indian population using various gauges of Quinckes spinal needle. Although epidural options are limited, especially with catheter techniques, the risk of PDPH following ADP can be reduced by using the smallest feasible epidural needles. Simply decreasing the size of epidural needles from 16 to 18 gauge has been reported to reduce the incidence of PDPH from 88% to 64% [8]. The issue of air versus liquid for identification of the epidural space with the loss-of-resistance technique has long been a source of controversy. Each method has acknowledged advantages and disadvantages, but neither has been shown convincingly to result in a lower risk of ADP. In this case, operator preference and experience would be expected to strongly influence performance, and the overriding significance of this factor is illustrated in fewer instances of ADP noted when the medium is chosen at the anesthesiologist’s discretion. Bevel orientation for epidural needle insertion remains a matter of debate. Norris *et al.* found the incidence of moderate-to-severe PDPH after ADP was only 24% when the needle bevel was oriented parallel to the long axis of the spine (compared to 70% with perpendicular insertion). This resulted in fewer therapeutic EBPs administered to patients in the parallel group ($p < .05$). However, this technique necessitates a controversial 90° rotation of the needle for catheter placement [9].

Conclusion

In the present study for PDPH using three different gauge Quincke spinal needles, the incidence was found to be minimum with 26 G needle.

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