

Post Dural Puncture Headache (PDPH) - A Prospective Study in Tertiary Care Hospital in Solan District (HP)

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ABSTRACT

Background: Spinal Anaesthesia is widely practiced anaesthetic technique for sub - umbilical surgical procedures. However the technique is not without complications and Post Dural Puncture Headache (PDPH) remains important amongst such complications. **Aims and Objectives:** The present study was prospective , was conducted to study the overall incidence of PDPH using 26 G Quincke type spinal needle and to establish its relations(if any) with the age of patient, type of surgery and time to ambulate following the surgery. **Methods:** A total of 500 patients of ASA I and II were studied. These patients underwent various orthopaedic, general surgical, obstetrical/ gynaecological surgical procedures under Spinal Anaesthesia using 26 G Quincke type spinal needle. All the patients were followed upto 72 hours post operatively for evaluation of PDPH. **Results:** The incidence of PDPH in the present study was 1.6%. The incidence was higher in female patients (75%). Among the female patients, 50% of patients were those who underwent Caesarean Section. **Conclusion:** The present study concludes free and widespread use of 26 G Quincke type needle in all patients who require Spinal Anaesthesia irrespective of type of surgery.

Keywords: Post Dural Puncture Headache, Quincke Needle, Spinal Anaesthesia.

INTRODUCTION

Spinal Anaesthesia is widely practised anaesthetic technique for sub- umbilical surgical procedures. The technique enjoys multiple advantages over General Anaesthesia in these situations which include viz rapidity of onset, minimal equipment requirement, little technical expertise, least alteration in blood chemistry, maintenance of optimal Arterial Blood Gases, negligible chances of technical failure, having conscious patient and thus having patent airway and good analgesia.^[1]

However, the technique is not without complications and Post Dural Puncture Headache(PDPH) still remains important amongst such complication.^[2] The Headache usually occurs within 3 days of the procedure.^[3] It is different from the usual headache which the patient would have been experiencing in the day to day life. The Headache has occipital and

nuchal component. It gets aggravated by sitting up posture and is relieved once patient lies down.^[4] Many factors have been implicated in its causation. These include Gauge of the spinal needle, type of spinal needle (cutting v/s pencil point needle),^[5] sex of the patient,⁶ pregnancy,^[6] smoking habits,^[7] altitude(atmospheric pressure and its effect on ICP) etc.^[8] Gauge of spinal needle has been reported to be the most important amongst them.^[9]

The Post Dural Puncture Headache can sometimes be very disturbing and may delay mobility and discharge from the hospital, thus increasing the unnecessary hospital bed occupancy. Reduction or total abolition of PDPH is highly desirable as it will enable the patient to return to early work especially after minor surgical procedures.

Aims and objectives:

The present study was prospective and was undertaken with the following aims and objectives:-
To study the overall incidence of Post Dural Puncture Headache using 26 G Quincke type spinal needle.

To study the incidence of PDPH (if any) in relation with age of the patient, type of surgery and time to ambulate following the surgery.

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MATERIALS AND METHODS

The present study was prospective and was undertaken in Maharishi Markandeswar Hospital, Solan (HP).

After taking approval from the institutional ethics committee, the study was conducted on 500 adult patients in age range 18 to 65 years with ASA status I and II of either sex, undergoing various sub-umbilical surgical procedures [Table 1] (both elective as well as emergency) under Sub Arachnoid Block using 26 G Quincke type spinal needle.

Inclusion criteria:

- ASA physical status I and II
- Age range 18 - 65 years.
- Patients willing to participate in the study.

Exclusion criteria:

- Patients with spinal deformities.
- Patients with contraindications to Subarachnoid block.
- Patients undergoing procedures of the spine itself.
- Known hypersensitivity to local anaesthetic.
- More than 1 attempt of dural puncture.
- Patients with history of chronic headache, migraine etc or previous PDPH experience.

Patients under study were followed up for 72 hours in post-operative period to document the incidence of PDPH (if any).

Anaesthesia technique:

A thorough pre anaesthetic check-up was conducted prior to surgery comprising of detailed history, physical and systemic examination. Routine investigations (complete haemogram, blood sugar, liver function tests, renal function tests, ECG, chest X-ray) were done prior to surgery. Special investigations were ordered as and when deemed necessary. Written informed consent was taken from all the patients.

After shifting the patients to the operation theatre, pre anaesthetic vitals were recorded. Preloading with Ringer Lactate in the dose of 15 ml/ kg body wt was done. Sub Arachnoid Block was administered in the sitting position with 26G Quincke needle via midline approach after LA infiltration of skin either at L3 - L4 or L4- L5 level using 2% Lignocaine. The maximum volume of 0.5% Bupivacaine heavy did not exceeded 3.5 ml in any patient. After deposition of drug in Sub Arachnoid Space, the patient was positioned depending upon the type of surgery. Necessary supportive interventions were done as and when required. Patients were visited for 72 hours postoperatively to document post spinal headache and its severity (if present). The severity of PDPH was graded as per the criteria of Lybecker.^[10]

MILD PDPH:

Postural headache with slight restriction of daily activities.

Not bedridden.

No associated symptoms.

Moderate PDPH:

Postural headache with significant restriction of daily activities.

Bedridden part of the day.

Associated symptoms may or may not be present.

Severe PDPH:

Postural headache with complete restriction of daily activities.

Bedridden all day.

Associated symptom present (Photophobia, diplopia, tinnitus, nausea, vomiting)

RESULTS

Table 1: Demographic Distribution

Demographics	n = 500
ASA I/II	387/113
Age(years)	41.5 (3.9)
Weight(kg)	58.6 (8.8)
SEX(M/F)	282/218

Table 2: Incidence Of PDPH

Total No. Of Patients: 500		
Incidence Of PDPH	8/500	1.6%
Sex		
Male	2/8	25%
Female	6/8	75%

Table 3: Incidence of PDPH and Type of Surgery

Type Of Surgery	No. of Patients with PDPH
Obstetrics(Lscs, Tubal Ligation)	4
Gynaecological (Tah, Vaginal Hysterectomy)	2
Urology (Turp, Turbt, Urs, Cystolithotomy)	0
General Surgery (Hernioplasty, Haemorrhoidectomy, Orchidopexy)	2
Orthopedics (Knee Arthroscopy, Tibial Plating, Ankle Arthrodesis)	0

LSCS: Lower Segment Caesarean Section, TAH: Total Abdominal Hysterectomy, TURP: Transurethral Resection of Prostate, TURBT: Transurethral Resection Of Bladder Tumour, URSL: Ureteroscopic Lithotripsy

Table 4:

Time to Ambulate	Patients with PDPH	
<24 hours	3/500	0.6%
24- 48 hours	3/500	0.6%
>48 hours	2/500	0.4%

PDPH: Post Dural Puncture Headache

Table 5

Severity with PDPH	No. Of patients with PDPH	
Mild	6/8	75%
Moderate	2/8	25%
Severe	0/8	0%

PDPH: Post Dural Puncture Headache

The results are summarized in the [Tables 1-5]. Out of 8 patients who experienced PDPH, incidence was significantly ($p < 0.001$) higher in females as

compared to males [Table 2]. Amongst females, parturients had higher incidence of PDPH in comparison to general female population [Table 3]. When patients were compared in different time zones as regards to ambulation time the results are comparable as shown in [Table 4]. Majority of patients with PDPH had Mild headache on severity scale with none having severe headache [Table 5].

DISCUSSION

Post Dural Puncture Headache (PDPH) continues to remain distressing complication of Spinal Anaesthesia. As the rate of loss of CSF through punctured dura (0.084- 4.5 ml/sec) is invariably more than rate of CSF production (0.35 ml/ min),^[11] there occurs Intracranial hypotension.^[12] The compensatory venodilatation in response to the hypotension leads to the PDPH.^[11]

The present project was undertaken so as to study the overall incidence and severity of PDPH using 26 G Quincke type spinal needle. The aim was also to identify any relation of PDPH with age, sex, type of surgery and time of ambulation.

The overall incidence of PDPH in our study was 1.6%. The reported incidence with use of 26 G Quincke needle in the literature varies between 0.3% to 20%.^[13,14] Hwang et al reported incidence of 2.08% while using 26 G Quincke needle.^[15] The incidence of PDPH of our study goes well in conformity with the available literature.

Out of 8 patients who developed PDPH in our study, 6 (75%) were females and 2(25%) were males .The higher incidence of PDPH in females is well known and has been reported in the other studies as well. Various physiological, anatomical and psychosocial causes have been implicated viz: females in general have greater sensitivity to noxious stimuli and increased degree of central sensitisation to same stimulus as compared to male.^[16-20] Similarly Social and psychological factors may have a contribution as males are less likely to report or disclose the presence of headache or pain as compared to female counterparts.^[21,22] Physiology too plays its part as vasodilation of cerebral vessels is more likely to occur in females.^[23,24] Finally oestrogen also contributes towards higher incidence of PDPH in female patients after the onset of puberty.^[25,26]

The present study is also in conformity of higher incidence of PDPH in Obstetrics patients undergoing Caesarean Section. Out of total 8 patients who experienced PDPH, 4(50%) of our patients underwent Caesarean Section under Spinal Anaesthesia. The probable explanation of higher incidence in these patients include changing hormonal levels, stress of labor and inadequate hydration of the parturient.^[1,27,28] Similar views have been expressed by other authors also.^[1,27,28]

Results were comparable as regards to number of patients with PDPH when compared in different

time zones of ambulation post operatively. Patients who were ambulated within 24 hours of completion of surgery when compared to patients who were ambulated between 24- 48 hours had similar number of incidence of PDPH(0.6%). Likewise patients ambulated > 48 hours after completion of surgery had incidence of 0.4%. Numerous studies have shown no effect of timing of ambulation in post operative period on the incidence of PDPH especially when spinal needles with 26G and more thinner needles are used. Park S et al performed a systematic review of studies and found no difference in PDPH prevalence between patients who were ambulated early and those who had 24 hours of bed rest.^[29]

Out of 8 patients who developed PDPH, 6 patients (75%) had mild headache while 2 patients (25%) suffered moderate headache. None of the patients had severe PDPH. Patients of both the groups were advised and managed with complete bed rest, plenty of oral fluids (about 3 litres for 24 hrs), paracetamol 650mg bd oral. All the patients had complete and uneventful recovery with discharge from hospital as per schedule.

CONCLUSION

In conclusion, the incidence of PDPH is minimal(1.6%) with use of 26G Quincke needle. The success rate of successful Sub Arachnoid Block with minimal attempts and cost effectiveness of the needle makes it a perfect choice for administering SAB in majority of patients. Though relatively higher incidence is seen in females especially so in parturients but keeping in view the superior safety profile of Spinal Anaesthesia over General Anaesthesia, this higher incidence can be overlooked. The study concludes free and widespread use of 26G Quincke spinal needle in all patients who require Spinal Anaesthesia irrespective of type of surgery.

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