

POST DURAL PUNCTURE HEADACHE - A COMPARISON OF MIDLINE AND PARAMEDIAN APPROACHES

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The purpose of this study was to compare two approaches for dural puncture regarding post dural puncture headache (PDPH) in general population presenting for surgery under spinal anaesthesia. A comparative observational study was conducted at Sir Ganga Ram Hospital, Lahore, from March 2005 to July 2005. Twenty five patients, planned to undergo elective surgery under spinal anaesthesia, were randomly assigned to each of the two groups. Group-M received sub arachnoid block (S.A.B.) using midline approach for dural puncture whereas in Group-P paramedian approach was utilized. Both groups were observed for PDPH for three post operative days. The PDPH was much less frequent in P group compared to M Group, thus it was concluded that paramedian approach should be used frequently for dural puncture for spinal anaesthesia.

Key words: *Post dural puncture headache, spinal anaesthesia, midline, paramedian.*

INTRODUCTION

Post dural puncture headache still haunts the anaesthetist who practice spinal anaesthesia and the surgeons who face the complaint next morning by some patients¹. Excessive loss of cerebrospinal fluid through dural holes leading to low cerebrospinal fluid pressure and resultant traction on intracranial structures is its widely accepted aetiology^{2,3}. Current emphasis is on small gauge needles and certain needle tip designs to minimize incidence of PDPH¹². However spinal anaesthesia practice at many local facilities involves use of relatively large gauge Quincke needles. Reasons behind this practice are multiple including indifference, unawareness, cost and unsupervised work. It appears we may take sometime to catch up with the trend of small gauge non-cutting needles. We thought it worthwhile to test some way of reducing the incidence of PDPH while still following the vogue of 23G Quincke needles. Moreover small gauge needles have some limitations of their own e.g. difficulty in dural puncture, relatively high failure rate, need to use introducer, cost etc⁴. On the other hand midline approach involves passage of needle through supraspinal, interspinal and ligamentum flavum, the paramedian approach avoids supra and interspinal ligaments and hits ligamentum flavum directly after passing through para spinal muscles⁵.

PATIENTS AND METHODS

Fifty patients aged 15-80 years, of either sex, ASA category I & II presenting for elective surgery under spinal anaesthesia were included in this study. Indications for surgery included inguinal hernias, fistulae in ano, haemorrhoids, anal fissures and varicose veins. Patients not willing for surgery under spinal anaesthesia, having history of cluster headaches, bleeding diathesis, aspirin intake in preceding week, preexisting neurological disorder, infection at the site of dural puncture, abnormality of vertebral column and patients in whom dural puncture had to be repeated were excluded from study. A day before surgery the patients were assessed and informed consent was obtained. Selected patients were randomly allocated group M or group P by balloting. Group-M received subarachnoid block through midline approach and group-P through paramedian approach. All the blocks were performed in sitting posture after appropriately preloading with Lactated Ringer solution and observing aseptic measures. The skin was infiltrated with 1% lignocaine solution. Hyperbaric bupivacaine 0.75% solution was used as local anaesthetic agent. After surgery patients were shifted to wards where they were observed for three post operative days regarding PDPH. The patients discharged earlier than three days were followed up telephonically.

The degree of headache on assuming erect posture was graded as follows:

- P₀ No pain
- P₁ Mild pain requiring no treatment
- P₂ Moderate pain treated with non-steroidal anti-inflammatory drugs and caffeine containing analgesics.
- P₃ Severe pain not responding to above treatment and warranting epidural blood patch.

Statistical analysis

Demographic and pain score data were analyzed using SPSS (statistical package for social sciences) version 11. Age and weight of the patients were compared using student's t-test and pain score in two groups was compared using Fisher's test.

RESULTS

Table 1: Demographics.

	Group-M	Group-P	P value
Mean age (years)	39.68	45.64	0.178
Mean weight(kg)	66.08	66.44	0.736

Table 2: Pain score.

	Group-M	Group-P	P value
Nil	18	24	
Mild	2	0	<0.05
Moderate	5	1	<0.05
Severe	0	0	

There was no difference in two groups regarding age ($p = 0.178$) and weight (0.736) (table 1). In group-M (midline) seven in a total of twenty five experienced PDPH. Among these 7 two had mild headache and five suffered from moderate degree of headache according to our laid down criteria. In group-P (paramedian) just one patient out of twenty five experienced moderate degree of headache (table 2). Difference in incidence of PDPH between two groups (7vs1) was statistically significant. No patient in either group suffered from severe headache.

DISCUSSION

Literature during early ninteens suggested about 50% incidence of PDPH⁶ but presently, many studies conducted in the recent years indicate a much lower incidence of PDPH after spinal

anaesthesia using results of different sizes⁷⁻⁹. Many of these studies have taken parturient as subjects who are at a particularly high risk of PDPH. Although relatively large size of needle was used in the present study the incidence of PDPH is comparable to those studies in which 25-G or smaller needles were used¹⁰. The reason for overall comparable incidence could be the use of paramedian approach for dural puncture in the present study. Only 4% in group-P had PDPH as compared to 28% in group-M. The difference is not only clinically significant but also statistically so ($p < 0.05$) (table 2). Although incidence of PDPH is clearly demonstrated to be lower with paramedian approach as compared to the midline for dural puncture, the reason for this is not clear. An earlier study involving relatively older population has shown either no difference or higher incidence of PDPH with paramedian approach¹¹. In that study 25-G Whitacre needle was used. The ease of dural puncture was noted with paramedian approach although no data is available regarding this observation.

It was thus **concluded** that paramedian approach using Quincke level needle reduces the incidence of PDPH.

REFERENCES

- Kuczowski KM, Benumof JL. Once a post dural puncture headache patient always post dural puncture headache patient? Acta Anaesthesiol Belg. 2003; 54 (2): 167-8.
- Grant R, Cndon B, Hart I, Teasdale GM. Changes in intracranial CSF volume after lumbar puncture and their relationship to post lumbar puncture headache. J Neurol Neurosurg Psychiatry. 1991; 54: 440-2.
- Rando TA, Fishman RA. Spontaneous intracranial hypotension: report of two cases and review of literature. Neurology 1992; 4: 481-7.
- Fauzia Bono, Saeeda Haider, Sadqa Aftab, Tipu Sultan. Comparison of 25-G Quincke and Whitacre needles for post dural puncture headache in obstetric patients. JCPSP 2004 Vol 14 (11): 647-650.
- G. Edward Morgan, Jr. Maged S. Mikhail. Spinal Epidural and Caudal Blocks. Clinical Anaesthesiology. (Lange) Second Edition. (Los Angeles) 1995 p 211-244.
- Lee JA, Arthur Edward, James Barker. 1850-1916. British pioneer of regional analgesia. Anaesthesia 1979; 34: 885-91.
- SZ Haider, Y. Saeed, M.Akram, S Khawaja. Comparison of Quincke and Pencil-point bevels in 25-G Needles regarding post dural puncture headache in Caesarean Section. Annals Vol 11, No. 2. Apr-Jun 2005; 81-82.
- Campbell DC, Douglas MJ, Pavy TJ, Merrick P, Flanagan ML, Mc Morland GH. Comparison of 25-

- gauge Whitacre with 24-gauge Sprotte spinal needle for elective caesarean section: Cost implications. *Can J Anaesth.* 1993; 40: 1131-5.
9. Quaynor H, Tronstad A, Heldaas O. Frequency and severity of headache after lumbar myelography using a 25- gauge pencil-point (whitacre) needle. *Neurology* 1995; 37: 553-6.
 10. Guerts JW, Haanschoten MC, Van Wijk RM, Kraak H, Besse TC. Post dural puncture headache in young patients: A comparative study between use of 0.5 mm (25-gauge) and 0.33 mm (29-gauge) spinal needles. *Acta Anaesthesiol. Scand.* 1990: 350-3.
 11. Janik R, Dick W. Post spinal headache. Its incidence following the median and paramedian techniques. *Anaesthetist.* 1992 March; 41 (3): 137-41.
 12. Dk Turnbull and DB Shepherd. Post dural puncture headache: pathogenesis prevention and treatment. *Br J Anaesth* 2003; 91: 718-29.