

# POST DURAL PUNCTURE HEADACHE; COMPARISON OF 25 AND 27G SPINAL NEEDLES IN UROLOGICAL PATIENTS

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## ABSTRACT

**Objective:** To compare the spinal needles of 25 and 27 gauges for the frequency of postdural puncture headache after spinal anaesthesia in young patients under going urological procedures.

**Study Design:** Cross sectional-comparative study.

**Place and duration of study:** Department of Anaesthesia. Institution of kidney disease. Hayatabad Medical Complex, Peshawar from June 2008 to December 2008.

**Patient and Methods:** 100 patients, fulfilling the American society of Anesthesiologist (ASA) I and II, were included in the study and the results of PDPH in both groups were compared and chi square test was applied. The level of significance was significant, if p value was less than 0.05.

**Results:** Post dural puncture headache was observed in 30% in group A and 14% in group B. Female patients had a higher frequency of PDPH in both groups.

**Conclusions:** The frequency of post dural puncture headache (PDPH) was less in higher gauge of spinal needles and more frequent in females than males.

**Key Word:** Spinal anesthesia. Post dural puncture headache. Caesarian section, Spinal needle.

## INTRODUCTION

Spinal anaesthesia has been widely practiced for surgery below the umbilicus<sup>1</sup>. The well known complication of spinal anaesthesia, postdural puncture headache (PDPH), is especially troublesome in young patients<sup>2</sup>. PDPH is an iatrogenic complication of neuroaxial anaesthesia and results from the puncture of the duramater. The signs and symptoms of PDPH result from loss of cerebrospinal fluid, traction on the cranial contents and reflex cerebral vasodilatation<sup>3</sup>.

Factors reported to influence the incidence of PDPH<sup>4</sup> are age, sex, pregnancy, previous history of pdph, needle size, needle tip<sup>5-6</sup> bevel orientation to dural fibers, the number of lumbar puncture attempts<sup>4</sup> and clinical experience of the operative<sup>8</sup>.

It aggravates in sitting and standing position, straining and patient's physical activity<sup>9</sup>. The aim of this study to compare two different gauges of spinal needles for the frequency of postdural puncture headache after spinal anaesthesia, that is 25G and 27G quincke, in young patients undergoing urological surgery.

## PATIENTS AND METHODS

A cross-sectional comparative study was done in anaesthesia department of institution of kidney disease,

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Hayatabad Medical Complex, Peshawar during a period of seven months i.e. from June 2008 to December 2008. One hundred young patients aged 20 to 45 years of ASA I and II and fulfilling our criteria, were recruited in the study.

They are divided into two groups of 50 each. In both groups, the patient were randomly selected. Group A received spinal anaesthesia with 25G quincke needle and group B received spinal anaesthesia with 27G quincke needle. Patients with neurological deficits, psychological ailment, history of preoperative headache, coagulation disorders and those requiring 2nd attempt for spinal were excluded from the study.

## PROCEDURE

After taking informed consent from the patients, examined physically, particularly the spine was examined. Any indicated laboratory test done were also checked to be within the normal limits. The technique of spinal anaesthesia included lumbar puncture (LP) with spinal needle with a tapering sharp tip (Quincke needle) kept parallel to the longitudinal fibers of spinal cord, using standard procedure, precautions, and positions.

The patients were placed in lying position immediately after giving spinal anaesthetic to achieve the desired level of block. Blood pressure was checked automatically at one minute level for first 5 minutes and then every five minutes through out the procedure. Level of sensory block was assessed immediately prior to the incision, using absence of touch or temperature sensation. Each patient was visited on the 1st and 2nd post operative day to check for post dural puncture

headache whether aggravated by standing or straining and relieved by lying down.

Severity of headache was gauged by using a visual analogue scale ranging from 0-4. 0 being the absence of headache, 4 being the worst headache. Patients were observed for post dural puncture headache in the recovery room and then in the ward for the first and second post operative days. Patient having complained of post dural puncture headache were treated with conventional methods including lying flat, giving iv fluids and avoidance of straining. Those patient who were not relieved, were given oral analgesics (mefanamic acid. 500mg). The results of PDPH in both groups were compared and chi square test was applied, the level of significance kept at p-value less than 0.05.

## RESULTS

Hundred patients with ASA status I and II were recruited for the study. They were divided equally in two groups A and B. Each group had 50 patients. Group "A" patients had spinal anaesthesia with 25 g spinal needle and group "B" had spinal anaesthesia with 27 G spinal needle. The 25G group A, 15(30%) out of 50

**Table 1: Grading of PDPH Severity<sup>40</sup>**

Mild	No limitation of activity. No treatment required
Moderate	Limited activity. Regular analgesics required
Severe	Confined to bed, anorexic. Unable to feed baby

**Table 2: Spinal needle's gauge related post Dural Puncture headache in two groups**

		Group		Total
		A (25 G, Q)	B (27 G, Q)	
PDPH	Yes	15 30.0%	7 14.0%	22 22.0%
	No	35 70.0%	43 86.0%	78 78.0%
Total		50 100.0%	50 100.0%	100 100.0%

**Table 3: Gender wise comparison of PDPH in two groups**

		PDPH		p-value
		Yes	No	
Group A ( 25 G, Q)	Male	5	20	0.108
		20.0%	80.00%	
	Female	10	15	
		40.00%	60.00%	
Group B (27 G, Q)	Male	3	23	0.305
		11.54%	88.46%	
	Female	5	19	
		20.83%	79.17%	

had PDPH while in the 27G group B, 7(14%) out of 50 patients had PDPH Table 2. P value was less than 0.05 and it was significant.

Female patients had a higher frequency of PDPH in both groups. In Group A, 40% females patient while 20% male patients had PDPH although it is insignificant with p-value 0.108. Similarly in Group B, females have high percentage as compared to male patients but insignificant with p-value=0.305. Table 3.

## DISCUSSION

PDPH is an iatrogenic complication of spinal anaesthesia and result from the loss of cerebrospinal fluid (CSF) through puncture of duramater, traction on the cranial contents and choroid plexus is unable to secrete sufficient fluid to maintains the CSF pressure.<sup>10,11,12,13</sup>.

There is the potential for considerable morbidity due to PDPH and there are reports of PDPH symptoms lasting for months or years<sup>14</sup>, untreated PDPH leading to subdural haematoma<sup>15</sup> Therefore the anaesthesiologists are advised to prevent PDPH by optimizing the controllable factors like spinal needle size as well as shape while conducting spinal anaesthesia.<sup>16</sup>

The frequency of PDPH after spinal anaesthesia has been reported to vary from 0%<sup>17</sup> to 30%<sup>18</sup>. Thicker the needle and more traumatic the type of needle, cutting type, more the incidence of PDPH<sup>19</sup>. In our study, the frequency of PDPH was 30% in group A and 14% in group B.

Reported frequency of PDPH ranges from 4% 20 to 40%<sup>21</sup> when 25G quincke spinal needle is used in young patients. Ross et al reported PDPH in 9% of patients<sup>22</sup>, study by lambart DH, the frequency of PDPH 1.06%, 3.65% and 2.08% with 25G whitacre, 25G quincke and 26G quincke spinal needle respectively<sup>23</sup>.

The PDPH in healthy ambulatory volunteers was 12% with 27G spinal needle while it was 4% in hospitalized patients with the same gauged needle<sup>24</sup>. Short duration (one hour) of supine recumbance may be as efficient as long duration (four hours) of supine recumbance to prevent PDPH<sup>25</sup>. In the present study, all the patients were instructed to remain in supine position

for 24 hours in the post operative period.

In our study, we compare the two cutting quincke spinal needles as it is easily available in the market. The bevel of the spinal needle was inserted parallel to longitudinal dural fibers so that these fibers are separated and a narrow slit like opening is obtained with a greater tendency to contraction and plugging of the hole, decreasing the leakage of CSF. Tabedar et al compare the insertion characteristics of spinal needle, PDPH was 56 times less in parallel insertion than the perpendicular insertion of bevel of spinal needle to the longitudinal dural fibers<sup>26</sup>.

Studies have indicated that decreasing the needle gauge, reduces the frequency of PDPH, however, it increases the technical difficulty leading to increase in the failure rate<sup>27</sup>. And also increase the chance of a dural puncture with the introducer needle. Macsuri S reported that the use of smaller gauge needle resulted in PDPH in 6% with 25G needle<sup>28</sup>. Santenen et al found minimum resistance with 29G needle but encountered difficulty in performing dural puncture.<sup>29</sup> In this study, we use introducer for 27G spinal needle. In both groups, spinal needle insertions were successful.

In our study, PDPH was more common in females as compared to males. There may be several reasons why a higher incidence of PDPH is seen in females. It is well recognized that females have a higher incidence of certain types of headache such as tension and migraine headache.<sup>31,32</sup> In addition, females exhibit greater sensitivity to experimentally induced pain<sup>32,33</sup>. Sex bound difference is caused by emotional and hormonal factors<sup>34</sup>. Females may exhibit a higher incidence of PDPH 7.4% compared with males 3.4%.<sup>35</sup> Younger women may be at greater risk, because of increased dural fiber elasticity that maintains a patent dural defect compared to a less elastic dura in older patients<sup>36</sup>.

Smokers had a lower incidence of PDPH than non smokers<sup>37</sup>. Treatment includes lying flat, simple oral analgesics, opioids, a high fluid intake, intravenous caffeine and sodium benzoate infusion. I/V cortisone has also been reported for treatment of PDPH. Besides conventional treatment for PDPH, epidural blood patch (EBP) for the treatment of severe refractory headache of different etiologies of PDPH is the best option<sup>38-39</sup>.

None of our patients had PDPH so severe to be treated by EBP. Intensity of headache was mild to moderate and was easily relieved by conventional techniques and oral analgesics.

## CONCLUSION

The frequency of PDPH decreases with the use of smaller gauged spinal needles and it is more in females as compared to male patients.

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