



IMPACT OF SIZE OF THE SPINAL NEEDLE ON THE INCIDENCE AND SEVERITY OF POST SPINAL HEAD ACHE

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ABSTRACT

Aims and Objectives: To study the effect of different sizes of spinal needles on

1. The incidence of post spinal head ache.

2. Severity of post spinal headache.

Synonyms: Post lumbar puncture head ache (PLPHA), Post Dural puncture head ache (PDPHA), Post spinal head ache (PSHA).

Post spinal head ache is a common problem after dural puncture for either diagnostic CSF tap or for subarachnoid block for anesthesia. Sometimes it is so severe as to cause suspicion of meningitis. At times so incapacitating that patient cannot get up. Many times it increases hospital stay. Overall, it increases the morbidity and cost of treatment. Various methods are advised for the prevention of head ache after dural puncture. One of them is to use finer spinal needles. We undertook a randomized controlled (23G as control) double blind study to test if finer spinal needles produce lesser incidence of post spinal head ache. Though plenty of articles are available on study of types of needles, there are not many articles comparing different needle sizes. So we undertook this study.

KEYWORDS : Post lumbar puncture head ache, Post Dural puncture head ache, Post spinal head ache, Spontaneous Intracranial Hypotension (SIH), 23 G spinal needle, 26 G Spinal needle.

Introduction:

Post spinal head ache is a common problem after dural puncture for either diagnostic CSF tap or for subarachnoid block for anesthesia. It is said to be more common in younger age group (1) and pregnant with lower body mass index (2).

Typically spinal head ache is bilateral, more occipital, aggravated by sitting up, relieved by lying down. It occurs within 7 days of dural puncture and disappears by 14 days. Rarely it can last for months and even an year. In 1999, Klepstad reported a case of post spinal headache which lasted for more than 1 year following spinal anesthesia for lower limb fracture, which was successfully treated by epidural blood patch (3). Other causes of (which may be coincidental during post dural puncture period) headaches do not have these typical features of post spinal head. If the headache lacks these features, clinician should be on alert to rule out other causes (sometimes serious conditions like meningeal infection, tumour etc...) of headache. Headache is due to stretching of pain sensitive basal meninges when patient sits up or stands (4). Often headache is associated with neck pain, meningismus and vomiting.

Randolph W and Evans in a special report on Complications of Lumbar Puncture, mentions that the incidence can be reduced by use of atraumatic or pencil tipped spinal needles (Sprotte or Whitacre type) (5).

Reported incidence of post spinal headache is varies widely from 0.1 to 36% (6). Factors affecting the incidence of post spinal headache are (7,8),

1. Needle size
2. Direction of the bevel
3. Needle design
4. Replacement of the stylet
5. Number of lumbar puncture attempts

Contrary to the common belief, following factors do not affect the incidence of post spinal headache (7).

1. Volume of CSF removed.
2. Position during lumbar puncture: Lateral or Sitting up.
3. Improving hydration: Either oral or IV Fluids before the procedure.
4. Bed rest.

Though many factors are there, we wanted to evaluate only one factor, the needle size. This will make the conclusions easier and

clearer. The other factors may be tested in another trial separately. Study design was such that all other factors were similar in all patients in the study, so that we can evaluate the effect of needle size alone accurately. We undertook a randomized controlled (23G as control) double blind study to test whether thinner spinal needles affect the incidence and the severity of post spinal head ache.

Materials and Methods:

All patients who are undergoing lower abdominal surgery under spinal anesthesia during the period Jan 2014 to Dec 2015 in Lakshmi Nursing Home, Bhadravathi were included in the study.

Patients were randomly assigned to two groups. For the first group of patients, 23 G spinal needle is used. For the second group of patients, 26 G spinal needle of the same type and company is used.

Anesthesiologist would write the name of the patient and 23G (or 26G), put it in an envelope and seals it. Surgeon would not know which size needle was used. The envelope was not opened until all cases are documented and data base creation was started. Anesthesiologist did not visit the patients postoperatively. Surgeon looked after pain management in the post operative period and also followed up the patients.

Post operative management Protocol followed:

1. Foot end elevation for all patients in the immediate post operative period and continued for 24 hours. Patients were advised rest in bed for 24 hours.
2. Three litres of IV fluids were given in the post operative period.
3. All patients received IV infusion of Diclofenac 75 mg diluted in 100 ml of normal saline, IV Tramadol 1 cc every 8 hours. When oral feeds were resumed, Tablet Paracetamol 650 mg three times daily was introduced. This regimen was given for first 2 days (operated day and 1st postoperative day). From 2nd post operative day, all injections were stopped and Tablet Piraxicam (20 mg two times a day for 2 days and continued with once daily dosage) was given along with Tablet Paracetamol 650 mg three times daily. Oral analgesics were continued up to 5th Post operative day. Same protocol of pain management was followed in all patients.
4. Patients were followed up for 1 month.
5. In the post operative period if any patient complained of head ache, severity of headache was assessed by using VAS (Visual Analogue Scale) and the VAS score was recorded by the surgeon.

Inclusion Criteria: Age group 15 – 60 years.

Exclusion criteria: Prior history of Migraine.

Student T test and Chi square tests were used to test the statistical significance in the difference between the groups and calculate P value.

Results:

A total of 212 patients were included in the study. Number of patients assigned to different groups is shown in the table 7.

Table 7.

23 G Group	98
26 G Group	114
N	212

Age distribution is shown in the table 8. There was no statistically significant difference in the age distribution between the groups using Student T test (P=0.668).

Table 8.

Age	
23 G Group	38.51±13.47
26 G Group	39.29±13.17
T test P =	0.668

Male female ratio is shown in the table 9. P value for the table is 0.53 (Chi square test), showing there is no statistically significant difference in the sex distribution between the groups.

Table 9.

Males	Female	M:F
59	39	1.512821
62	52	1.192308
Chi test for M:F P = 0.53		

Headache incidence was 23.46% in the patients who received spinal anesthesia with 23 G needle in comparison with 11.4% in patients who received spinal anesthesia with 26 G needle. Data is shown in the table 10. Chi test results P = 0.019.

Table 10.

Incidence of Head ache			
	N	Head ache	Percentage
23 G Group	98	23	23.46
26 G Group	114	13	11.40
	N = 212		
Chi test P =	0.019		

Also, the severity of headache was significantly higher in the group who received spinal anesthesia with 23 G needle. Table 11 shows the comparison of the VAS scores of the two groups. Student T Test was used to this data. P=0.005.

Table 11.

VAS Score	
	N
23 G Group	23
26 G Group	13
	N = 212
T Test P =	0.019

When severity of headache was classified into Mild (VAS Score 1-3), Moderate (VAS Score 4-6) and Severe (VAS Score 7-10), it was found that more number of patients had moderate headache in 23 G group in comparison with more number of patients had mild headache in 26 G group. (P value = 0.005, highly significant). Results are shown in table 12.

Table 12.

Severity of Head ache				
	N	Mild 1-3	Moderate 4-6	Severe 7-10
23 G Group	23	4	18	1
26 G Group	13	8	4	1
	N = 212			

Chi test P=0.005

Discussion:

Although spontaneous onset of spinal headache is reported, great majority arises after a dural puncture for either diagnostic or therapeutic purpose. Wendy D Jones et. al. have reported a case of spontaneous onset of headache following rupture of spinal arachnoid cyst (9).

The incidence of post spinal headache is related to size of the needle used for dural puncture. It is postulated that the CSF leaks from the puncture site causing a low CSF pressure which is the cause of headache. Thicker the needle, bigger will be the puncture. Hence, more CSF leaks, resulting in higher the incidence of headache. Conversely, thinner needles produces lesser incidence of headache (8). Way back in 1994, Helpern and Preston showed in a meta-analysis that incidence of spinal headache is less with use of thinner spinal needles (10). Incidence of post spinal headache in different studies varies from 0.1 to 36% (6). Our overall incidence is 16.98% (36/212). The incidence was significantly less when thinner gauge needle was used. In our series, headache occurred in 11.4% in patients when 26 G needle was used in comparison with 23.46% when 23 G needle was used. The results were statistically significant (P=0.019).

The severity of headache is also related to needle size. When severity was quantified with VAS Score, the average score for 23 G group was 4.52±1.15 and that of 26 G group was 3.46±1.36. When Student T test was applied, the result was significant at significance level of P < 0.05. (P = 0.019).

When VAS scores were categorise as Mild (VAS Score 1-3), Moderate (VAS Score 4-6) and Severe (VAS Score 7-10), we found that in 26 G group, more cases fell into mild category and in 23 G group more cases fell into moderate category.

There are other factors which affect the incidence of post spinal headache after dural puncture. But our objective in the present study was only to study the effect of size of the needle.

Conclusions:

Use of thinner spinal needles is associated with significantly lesser incidence of post spinal headache. Headache when occurs, will be of lesser severity if thinner needle is used. We strongly recommend 26 G needles for spinal anesthesia whenever feasible.

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