

# A PROSPECTIVE COMPARATIVE STUDY OF ASSOCIATION BETWEEN SPINAL FLEXION AND POST DURAL PUNCTURE HEADACHE

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## ABSTRACT

### BACKGROUND

Spinal anaesthesia for surgical procedure was started in late nineteenth century and so the post dural puncture headache. In those days incidence use to be very high but with the fine gauge needle and better technique the incidence has largely reduced. But it is still an important cause of headache in post-operative period and depends upon not only the size type of needle but also various other factor like experience of person performing, age, sex and technique used.

### MATERIALS AND METHODS

Present study has been conducted in the department of anaesthesia Konaseema institute of medical science. It is a prospective randomized observational study conducted during May 2015 to June 2017. The study is approved by institutional ethical committee. Patient selected for this study were divided into two groups. First group belongs to spinal flexion group (Gs) having 30 patients and second group having HIP flexion group (GH) having 30 patients. Various data like Age, body weight, BMI, type of surgery, duration of surgery, number of skin puncture, number of needle passage., experience of anaesthesiologist (years), Duration of anaesthesia, Episodes of PDPH were noted.

### RESULTS

Out of 60 patients enrolled under study group 10 developed PDPH. Four patients were in spine flexion group and 6 were in hip flexion group. In spine flexion group 1<sup>st</sup> day one patient developed PDPH, on 2<sup>nd</sup> day two patients developed PDPH and one patient on third day. In hip flexion group one on first day, four on second day and one on third day but both are not statistically significant.

### CONCLUSION

We have found that incidence of PDPH was more in hip flexion than in spinal flexion but it was not statistically significant. We have found that the PDPH was more in younger age group than older people, but not significant statistically. In our study we have found that lower BMI is associated with higher PDPH which is not statistically significant.

### KEYWORDS

Comparative Study, Post Dural Puncture Headache, Spinal Flexion.

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### BACKGROUND

As per the definition by international Headache society 3<sup>rd</sup> edition (beta version), Post dural puncture headache(PDPH) can be defined as "Headache occurring within five days of a lumbar puncture, caused by cerebrospinal fluid leakage through the dural puncture. It is usually accompanied by

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neck stiffness and/or subjective hearing symptoms. It remits spontaneously within two weeks, or after sealing of the leak with autologous epidural blood patches.<sup>1</sup> Spinal anaesthesia for surgical procedure was started in late nineteenth century and so the post dural puncture headache. In those days the incidence used to be very high but with the introduction of fine gauge needle and better technique the incidence has largely reduced.<sup>2</sup> But it is still an important cause of headache in post-operative period and depends upon not only the size type of needle but also various other factor like experience of person performing, age, sex and technique used.

Present study has been designed to evaluate the effect of spinal flexion on post dural puncture headache on the patient operated under spinal anaesthesia in the dept. of obstetrics and gynaecology Konaseema institute of medical sciences.

## MATERIALS AND METHODS

Present study has been conducted in the department of anaesthesia Konaseema Institute of Medical Sciences. It is a prospective randomized observational study conducted during May 2015 to June 2017. The study is approved by institutional ethical committee. A written informed consent was also obtained from patient in a predesigned consent form. A total sixty patients were randomly selected for this study as per the exclusion and inclusion criteria.

### Inclusion Criteria

- Age:-20 to >60 Yrs.
- ASA status I-II.

### Exclusion Criteria

- ASA III and IV.
- Any contraindication for spinal anaesthesia.
- More than three skin puncture.

Patients selected for this study were divided into two groups. First group belongs to spinal flexion group (Gs) having 30 patients and second group having HIP flexion group (GH) having 30 patients. All patients were given same type of pre anaesthetic medication and advice. In the operation theatre all the vital parameters like heart rate, blood pressure, and oxygen saturation were measured as base line. A 18 G cannula was fixed and fluid administration was started as per protocol.

A multipara monitor was attached and all vital were continuously monitored.

The patients were made to lie down in lateral decubitus position and under all aseptic conditions sub arachnoid block was given by whitacre pencil tip needle. The number of skin punctures and needle passages were noted. The number of skin puncture more than three was excluded from the study.

The level of loss of sensation was assessed by 22G blunt needle, initially every 2 min and later every 5 min till highest level reached. All the vital parameters were measured every 5 min initially for first 45 min after that every 15 min till the surgical procedure is completed.

All the patients were observed for one hour in post-operative room and all the patient under study group were followed 14 days post-operative.

Patients were followed every day in the hospital till they get discharged and after every alternate day either by personal visit or by telephonically for post dural puncture headache. PDPH was diagnosed as per the diagnostic criteria of international headache society<sup>1</sup> and severity of the score was assessed by numerical rating score<sup>3, 4</sup>

Various data like age, body weight, BMI, type of surgery, duration of surgery, number of skin punctures, number of needle passages, experience of anaesthesiologist (years), duration of anaesthesia, episodes of PDPH were noted. Data was interpretation was done as mean, percentage, paired- t test and chi square- test.

## RESULTS

### Parameters Groups

Variables	Gs (n=30)	Gh (n=30)	t value	P value
Age(years)	36.15	36.5	0.19	<0.05
Body weight(kg)	58.7	58.5	0.15	<0.05
Height –(cm)	143.55	147.1	0.86	<0.05
BMI	26.05	26.01	0.21	<0.05
Duration of surgery(mins)	66.20	64.50	0.25	<0.05
Duration of anaesthesia(mins)	76.57	76.00	0.28	<0.05
Total abdominal hysterectomy	6	5		
Total abdominal hysterectomy with Bilateral salpingo-oophorectomy	2	3		
Elective CS.	14	12		
Elective CS+ tubectomy	6	8		
Vaginal hysterectomy	1	1		
myomectomy	1	1		

**Table 1. Demography of Study Group**

As per table 1 we have seen that the demographic variables are comparable to each other and p value was <0.05, the mean duration of anaesthesia was 76.57 and 76.00 min respectively and mean duration of surgery was 66.20 min and 64.50 min respectively in both the groups. Total number of hysterectomy was 11, with salpingo – oophorectomy was 5, total LSCS was 26, elective CS with tubectomy was 14, vaginal hysterectomy was done in 2 patients.

	Number	GS (n=30)	GH (n=30)	Total (n=60)
Number of skin puncture	1	20	18	38
	2	8	10	18
	3	2	2	4
Number of passages of needle	1	12	11	23
	2	14	14	28
	3	2	3	5
	4	1	2	3

**Table 2. Number of Skin Punctures and Needle Passage**

In spinal flexion group (Gs) single skin puncture was done in 20 patients, two skin punctures was done in eight patients and three skin punctures was done in two patients. In hip flexion group one puncture was done in 18 pts, two punctures were done in 10 pts and three punctures were done in two pts. Regarding number of passage of needle in of 30 pts in hip flexion group, it took one attempt in 11 patients, 2 attempt in 14 patients, 3 attempts in 3 patients and four attempt in 2 patients.

	<b>PDPH Num (%)</b>	<b>1<sup>st</sup> day Num (%)</b>	<b>2<sup>nd</sup> day</b>	<b>3<sup>rd</sup> day</b>	<b>4<sup>th</sup> day</b>	<b>7<sup>th</sup> day</b>	<b>10<sup>th</sup> day</b>
GS.	4	1	2	1	0	0	0
GH.	6	1	4	0	0	0	0

**Table 3. PDPH in two groups with respect to time**

p- value <0.005

Out of 60 patients enrolled under study group 10 developed PDPH. Four patients were in spine flexion group and 6 were in hip flexion group. In spine flexion group 1<sup>st</sup> day one patient developed PDPH, on 2<sup>nd</sup> day two patients developed PDPH and one patient on third day. In hip flexion group one on first day, four on second day and one on third day but in both groups it is statistically significant.

	<b>Variables</b>	<b>GS (Number)</b>	<b>GH (Number)</b>	
Age of the patients	20-30	2	3	Chi square static 0.1389 p value 0.932913
	30-40	1	2	
	40-50	1	1	
	50-60	0	0	
	>60	0	0	
Body mass index of the patients	20-25	2	4	Chi square static 0.2778 p value 0.870325
	25-30	2	1	
	>30	0	1	
Year of experience	>2 (n=40)	3	4	Chi square static 0.0794 p value 0.77816
	2-4 (10)	1	2	
	>4 (10)	0	0	

**Table 4. Relation between age, BMI and year of experience with PDPH**

Regarding relation between age and PDPH in GS group below 30 years of age patients were 2, one between 30 years and 40 years and one above 40 years. In GH group, three were below 30 years, two were 30-40 years and only one patient above 40 years who developed PDPH, but it was not statistically significant as p value 0.9329.

	<b>(Number of Attempt) (Number of patient)</b>	<b>PDPH.</b>	
Skin punctures	1(n=38)	1	Chi square statistic =11.2927, P value = 0.00353
	2(n=18)	6	
	3(n=4)	3	
Number of needle passage	1(23)	1	Chi square statistic 23.2149, p value 0.0003.
	2((28)	2	
	3(5)	3	
	4(3)	2	

**Table 5. Relation between skin puncture and PDPH**

As per table-4 the incidence of PDPH was more in lower BMI patients than in patients with BMI more than 30. But this is not statistically significant as per p value =0.870325. Regarding experience of anaesthetist the PDPH headache was more in experience below two years, but is not significant statistically as per p value 0.77.

As the number of skin punctures increases the number of patients with PDPH headache also increases, and the same is for number of needle passages also and both are statistically significant with p value <0.05.

## DISCUSSION

Present study is a prospective study conducted to evaluate the relation between post dural puncture headache and flexion of spine in relation with other parameters.

We have found that the incidence of PDPH was more in hip flexion than in spinal flexion but it was not statistically significant. Not much study was done on this but as per, Davoudi et al the incidence in sitting position is high than the lateral decubitus position<sup>5</sup> As per meta-analysis of Zorilla et al lateral decubitus position is better.<sup>6</sup>

We have found that the PDPH was more in younger age group than older people, but not significant statistically and the same result was found by other authors Choi PT et al, and J. Singh et al.<sup>7,8</sup>

In our study we have found that lower BMI is associated with higher PDPH which is not statistically significant, study of Ali Jabbari et al<sup>9</sup> has the same result but Peralta et al study did not match with our study.<sup>10</sup>

It is found in our study that as the experience of the anaesthesiologist is increased the incidence of PDPH was decreased and also the number of skin puncture and needle passages was less, so the PDPH also was less. The relation between skin puncture and needle passage was statistically significant which is similar to the study of K.M. Kuntz and Omole et al.<sup>11,12</sup> It occurs because higher the failure rate, there will more dural puncture and more leakage of CSF. The leakage of cerebrospinal fluid will be more and higher will be the incidence of post dural puncture headache.<sup>13</sup>

## CONCLUSION

We would like to conclude that post dural puncture headache is a common post-operative problem and it has multiple associations related to patient, anaesthesiologist and techniques, we have found that incidence is higher in hip flexion group than the spinal flexion group.

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