Section: Anaesthesiology

Original Research Article

A COMPARATIVE STUDY OF NSAIDS AND TRANSNASAL SPHENOPALATINE GANGLION BLOCK FOR THE TREATMENT OF POST DURAL PUNCTURE HEADACHE(PDPH) IN LOWER SEGMENT CAESAREAN SECTIONS(LSCS)

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Abstract

Background: Post-Dural Puncture Headache (PDPH) is a known complication of spinal anesthesia. The incidence of PDPH depends on many factors such as age, sex, pregnancy, previous history of PDPH, needle size, shape and needle bevel orientation to the dural fibers, number of dural puncture attempts and clinical experience of anesthetist. PDPH is thought to be due to cerebrospinal fluid leak which exceeds the production rate, resulting in downward traction of the meninges and parasympathetic mediated reflex vasodilatation of the meningeal vessels. **Materials and Methods:** 60 Patients in the age group of 18-40 years belonging to ASA - I & II divided into two groups [n=30] undergoing both elective and emergency caesarean section under spinal anaesthesia were randomly selected for surgery. **Result & Conclusion:** PDPH is a complication that occurs after a dural puncture following neuraxial anesthesia especially when a larger gauge cutting needle and with multiple attempts. When compared to other population obstetric patients are at a higher risk because of gender predisposition, younger age and greater exposure to neuraxial technique. In this double-blinded randomized control study, we compared the efficacy of Oral NSAIDs and Trans nasal Sphenopalatine Ganglion Block for the treatment of PDPH in obstetric patients who underwent LSCS under subarachnoid block. Oral NSAIDs (Tab.Diclofenac 50mg+ Tab.Paracetamol 500mg BD) was given for one group and Trans nasal SPGB was given bilaterally with a cotton tipped applicator soaked with 4% Lignocaine in other group. Nitu Puthenveettil et. al compared the efficacy of NSAIDs and Trans nasal SPGB for the treatment of PDPH in obstetric patients. They found that 89.99% patients in SPGB group had adequate pain relief within 30 minutes after the block, it lasted for up to 8 hours. Khanooja et. al published a randomized study in which they compared conservative treatment alone and SPGB with conservative treatment for PDPH. They found that VAS scores were significantly lower in SPGB Group at 0.5, 4, 24, 48 and 60 hours with p value of <0.001 when compared with conservative treatment. In our study also, VAS scores were significantly lower in SPGB group when compared to the NSAIDs group (p value < 0.001). The findings in our study are consistent with the recent case reports in the literature on the effectiveness of SPGB in the treatment of PDPH. The time taken to obtain clinical effects was compared and it was found that SPGB provided quicker and better relief than conventional treatment.

INTRODUCTION

Post dural puncture headache is a potential complication of a lumbar puncture. Symptoms of this condition include a bilateral frontal or occipital headache that is worse in the upright position along with nausea, neck pain, dizziness, visual changes, tinnitus, hearing loss, or radicular symptoms in the

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arms.[1-3] An autologous Epidural Blood Patch (EBP) is the gold standard for treating PDPH when the headache is persistent even after conservative management and it has a success rate of around 68%-90% in relieving PDPH.[4-6] Problems with using EBP includes chances of another possible Dural puncture, subdural hematoma, infection and neurological complications in some rare situations.[7,8] Sphenopalatine Ganglion is an extra cranial neural structure located in the pterygopalatine fossa that has both sympathetic and parasympathetic components as well as somatic sensory roots. Sphenopalatine ganglion block has been tried as a treatment modality for post dural puncture headache. In this study, we try to compare the efficacy of NSAIDs with Trans nasal Spheno Palatine Ganglion Block for treating Post Dural Puncture Headache (PDPH) in Lower Segment Caesarean sections (LSCS) under Subarachnoid block.[9,10]

MATERIALS AND METHODS

After obtaining institutional review board and patients written informed consent, the study was conducted in 60 patients belonging to ASA I and II between the age group 18 to 40 years undergoing both elective and emergency caesarean section were randomly selected for study. All the patients were assessed clinically preoperatively and presence of any medical disorder and history of hypersensitivity to any of the drugs used, infection at the site of spinal anesthesia, bleeding diathesis, pre-existing neurological or spinal disease and skeletal deformities. History regarding previous anesthesia, any significant medical illness, medications and allergy were recorded. Complete physical examination and airway assessment were done. The patients were randomized by using computer generated random numbers(www.graphpad.com) into 2 groups of 30 each.

GROUP A: In this Group, patients are treated with saline pack in the middle meatus of both nostrils and Tab. Diclofenac sodium+ paracetamol (50mg+500mg BD)

GROUP B: In this Group, Trans nasal Sphenopalatine Ganglion Block (SPGB) given with 4% lignocaine and also given Glucose tablet as placebo.

On admission basal vital parameters like heart rate, blood pressure and oxygen saturation and ECG was recorded. All the patients are instructed to drink plenty of fluids and to report if the headache increases and not tolerable. Patients with VAS score > 4 are given 1 g of intravenous paracetamol as rescue analgesia. And number of times the rescue analgesic needed is also noted. In the wards, all patients who underwent LSCS under subarachnoid block are followed from 6 hours post procedure until 60 hours after surgery. First visit was made in the evening 6 hours after surgery and every 12 hours. All the patients were questioned about any subjective symptoms of headache, nausea and vomiting. They were asked to mark on visual analogue scale, the intensity and severity of headache.

RESULTS

The collected data were analysed with IBM SPSS statistics software 23.0 version.

To describe about the data descriptive statistics frequency analysis, percentage analysis was used for categorical variables and for continuous variables the mean and S.D were used. The mean and standard deviation were calculated by using appropriate formula both for grouped and ungrouped data. To find the significant difference between the bivariate samples for independent groups the unpaired sample t-test was used. To find the association of significance in categorical data the Chi-square test was used. In all the above statistical tools the probability value 0.05 was considered as significant level.

Table 1: Frequency distribution of the study population.

		Frequency	Percent
	A	30	50.0
Valid	B	30	50.0
	Total	60	100.0

The frequency of distribution of population was compared between two groups which was not significant.

Table 2: The age distribution of the study population.

Crosstab					
			GROUP		Total
			A	B	
AGE GROUP	19-21 Years	Count	5	4	9
		% within GROUP	16.7%	13.3%	15.0%
	22-24 Years	Count	11	12	23
		% within GROUP	36.7%	40.0%	38.3%
	25-27 Years	Count	9	9	18
		% within GROUP	30.0%	30.0%	30.0%
	28-30 Years	Count	4	3	7
		% within GROUP	13.3%	10.0%	11.7%
	Above 30 Years	Count	1	2	3
		% within GROUP	3.3%	6.7%	5.0%

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Total		Count	30	30	60
		% within GROUP	100.0%	100.0%	100.0%

The above data showed that the age distribution was comparable between both the groups and there was no significant statistical difference between the groups.

Table 3: Comparison of VAS scores

VAS	GROUP	Mean	Std. Deviation	N
BEFORE TREATMENT	A	5.7333	1.46059	30
	B	5.6667	1.29544	30
	Total	5.7000	1.36915	60
AFTER 6 HRS	A	2.8667	2.55604	30
	B	1.6000	1.77337	30
	Total	2.2333	2.27266	60
12 HRS	A	2.8667	2.44573	30
	B	1.6000	1.84951	30
	Total	2.2333	2.24263	60
24 HRS	A	2.8000	2.38385	30
	B	1.8667	2.22421	30
	Total	2.3333	2.33374	60
36 HRS	A	2.7333	2.37709	30
	B	2.0667	2.13240	30
	Total	2.4000	2.26394	60
48 HRS	A	2.6000	2.52709	30
	B	1.8667	2.16131	30
	Total	2.2333	2.36046	60
60 HRS	A	2.2000	2.31040	30
	B	2.3333	2.10637	30
	Total	2.2667	2.19295	60

Table 4: comparison of VAS scores among the two groups.

	Tests of Within-Subjects Effects				
Source	**Type III Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
Time	620.992	7	88.713	43.015	.000
Time * GROUP	37.192	7	5.313	2.576	.013
Error (Time)	837.317	406	2.062		

Table 5: comparison of VAS score between 2 groups using tests of within subjects' effects.

		GROUP * Time			
GROUP	**Time**	**Mean**	**Std. Error**	**95% Confidence Interval**	
				Lower Bound	**Upper Bound**
A	Pre-Test	5.733	.252	5.229	6.238
	After 6 Hrs.	2.867	.402	2.063	3.671
	After 12 Hrs.	2.867	.396	2.074	3.659
	After 24 Hrs.	2.800	.421	1.957	3.643
	After 36 Hrs.	2.733	.412	1.908	3.559
	After 48 Hrs.	2.600	.429	1.741	3.459
	After 60Hrs	2.200	.404	1.392	3.008
	Pre-Test	5.667	.252	5.162	6.171
B	After 6 Hrs.	1.600	.402	.796	2.404
	After 12 Hrs.	1.600	.396	.808	2.392
	After 24 Hrs.	1.867	.421	1.024	2.709
	After 36 Hrs.	2.067	.412	1.241	2.892
	After 48 Hrs.	1.867	.429	1.007	2.726
	After 60Hrs	2.333	.404	1.525	3.141

The above data showed that there is a significant difference between groups and over the period by using 2-way repeated measures of ANOVA (p value<0.05).

Table 6: Comparison of side effects

SIDE_EFFECTS * GROUP Cross tabulation					
			GROUP		Total
			A	B	
	Nausea	Count	0	1	1
		% within GROUP	0.0%	3.3%	1.7%
SIDE_EFFECTS	Nil	Count	29	25	54
		% within GROUP	96.7%	83.3%	90.0%
	Streaks of blood noted	Count	1	4	5
		% within GROUP	3.3%	13.3%	8.3%

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Total		Count	30	30	60
		% within GROUP	100.0%	100.0%	100.0%

Pearson Chi-Square=3.096 p=0.213

Table 7: Need for rescue analgesia.

	Group Statistics						
	GROUP	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**	**t value**	**P value**
No of Rescue Analgesics	A	30	3.1667	2.92532	.53409	1.361	0.179
	B	30	2.2000	2.56502	.46831		

[Table 7] showing comparison of the need for rescue analgesia between two groups.

DISCUSSION

In our study, we recruited a total of 60 patients, who were divided into 2 groups as Group A and Group B. Group A received the conventional treatment in the form of oral NSAIDs, whereas Group B received Trans nasal Sphenopalatine ganglion block as the treatment for PDPH. All the patients were comparable with respect to age, onset of headache and ASA physical status. In this double-blinded randomized control study, we compared the efficacy of Oral NSAIDs and Trans nasal Sphenopalatine Ganglion Block for the treatment of PDPH in obstetric patients who underwent LSCS under subarachnoid block. Oral NSAIDs (Tab.Diclofenac 50mg+ Tab.Paracetamol 500mg BD) was given for one group and Trans nasal SPGB was given bilaterally with a cotton tipped applicator soaked with 4% Lignocaine in other group. In our study, we found that VAS scores are significantly lower in Group B (i.e., SPGB group) when compared to Group A (i.e., Oral NSAIDs). Group A had VAS scores: 2.866 + 2.55, 2.866 + 2.44, 2.800 + 2.38, 2.733 + 2.37, 2.600 + 2.52, 2.200 + 2.31 and Group B had: 1.600 + 1.77, 1.600 + 1.84, 1.866 + 2.22, 2.066 + 2.13, 1.866 + 2.16,2.333 + 2.10 at 6 hours,12 hours, 24 hours, 36 hours, 48 hours and 60 hours respectively after treatment with NSAIDs and Trans nasal SPGB with the p value of < 0.05, which is statistically significant. Group A had VAS scores: 2.866 + 2.55, 2.866 + 2.44, 2.800 + 2.38, 2.733 + 2.37, 2.600 + 2.52, 2.200 + 2.31 and Group B had: 1.600 + 1.77, 1.600 + 1.84, 1.866 + 2.22, 2.066 + 2.13, 1.866 + 2.16, 2.333 + 2.10 at 6 hours,12 hours, 24 hours, 36 hours, 48 hours and 60 hours respectively after treatment with NSAIDs and Trans nasal SPGB with the p value of < 0.05, which is statistically significant. Pre-procedure pain scores were noted by using VAS scoring system. They were comparable between the groups, both having the mean score of 5.7 and 5.6 prior to the treatment in Group A and B respectively. In group A, the mean pain score was 2.8 at 6 hours after treatment whereas in group B, it was 1.6. At 12 and 24 hours the mean pain score was 2.8 in group A and 1.6 in group B which was significantly lower than group A. While comparing the groups with mean pain score it was found that from 6 hours to 24 hours the patients in group A had significantly higher pain scores when compared to the patients in group B. At 60 to 60 hours, there was no difference between the two groups. Both groups had the mean pain score of around 2. It was seen that the average number of the times the patient needed rescue analgesia was 3.16 times in group A when compared to 2.2 times in group B.

Out of 30 patients in group A, at the end of 2 hours, 16 patients had pain relief of which 10 patients had complete pain relief and 6 patients had only decrease in severity of pain. In group B, out of 30 patients, at the end of 2 hours, 25 patients had pain relief of which 14 patients had complete pain relief and 11 patients had only decrease in pain relief. Out of 30 patients who were subjected to SPGB, 5 patients had side effects in the form of nausea and nasal bleeding. 1 patient had Nausea post procedure and streaks of blood was noted in the cotton applicator in 4 patients. Hence, patients with PDPH should be considered primarily for SPGB and Epidural Blood Patch can be used as a rescue modality of treatment only if needed. Thus, Trans nasal SPGB can be used as an initial and safe modality of treatment for patients with PDPH for rapid control of severe pain, which is minimally invasive and less complications.

Though it did not provide complete relief in all patients, it decreases the severity in most of the patients. If practiced properly, it can be used as an effective treatment with lesser failure rates. Further studies with larger sample size and various other drugs for SPGB are needed.

CONCLUSION

From our study, we conclude that Trans nasal SPGB is superior to conventional treatment with oral NSAIDs in the treatment of Post Dural Puncture Headache in terms of decrease in the intensity of pain and need for rescue analgesia. There was a significant difference in the VAS scores between the 2 groups. In SPGB group, 4 patients had nasal bleeding which were only streaks of blood not requiring any further intervention. Thus, Trans nasal sphenopalatine ganglion block can be used as an effective and safe modality of treatment for PDPH in obstetric patients without any major complications.

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