

Efficacy of the Epidural Blood Patch for the Treatment of Post Epidural Puncture Headache

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ABSTRACT

Objective: To evaluate the efficacy of the epidural blood patch for the treatment of post-Dural puncture headache (PDPH).

Patients and Methods: This cross sectional study was conducted in the Department of Anesthesia and Intensive care, Nishtar Hospital Multan. Out of total 326 patients, 186 were male 140 were female. Patients having age 16 years and above, presented with PDPH started from previous 24 hours up to last six days were included in the study. Efficacy of treatment was measured on patients comment about relief from pain after PDPH. Chi-Square along with Fisher exact test was used to see effect modification.

Results: Overall, there were 326 (100%) patients in this study, among them 57% (n=186) were males and 43% (n=140) were females. ASA-1 and ASA-2 noted as 73.3% and 26.7% respectively. The main outcome of this study was efficacy of treatment. It was observed that after 1st patch, efficacy was noted as good in 75.8% (n=247) patients, while after 2nd patch it was good in 97.5% (n=318) patients. There was significant difference between the efficacy of 1st and 2nd patch. (P value=0.000), according to Fisher exact test.

Conclusion Results of our study concluded that epidural blood patch (EDBP) is the better choice for treatment of epidural puncture headache (EDPH). If one time it is incompletely effective its 2nd patch can be considered.

Key words: Blood patch, Effectiveness, Epidural puncture Headache.

Author's Contribution

¹ Conception, synthesis, planning of research and manuscript writing Interpretation and discussion

² Data analysis, interpretation and manuscript writing, ^{3,4} Active participation in data collection, Review the manuscript

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Introduction

About 40% of patients given epidural anesthesia are complicated by headache and named as post-dural puncture headache (PDPH).¹ PDPH is an orthostatic illness, which is aggravated in vertical and diminished in horizontal or lying position. Headache is caused due to leakage of spinal fluid into epidural space through dural rent. Leakage of spinal fluid leads to decrease in pressure and causes traction in upright position. Other symptoms of CSF leakage like tinnitus, myalgia, dizziness and diplopia may be present along with headache.² In 85 to

90% of cases, PDPH occurs within 2 days (48 hours) but there is a possibility of complain immediately after epidural.³ PDPH and its symptoms are limiting and are relieved in 6 to 7 days in 80% of patients. A very few patient's complain PDPH lasting for weeks or months, it may be psychological. PDPH is episodic pain, during its episodes' patients may confine to bed and have financial and psychological effects.⁴

Many techniques and prophylactic measures like use of Sprotte's needle, needle of small size, direction correction

(bevel perpendicular to dura) have been introduced and all are effective in reduction of PDPH.⁵ After all these modalities if patient still complains about pain, then epidural blood patches (EDBP) can be used. It is a new and beneficial intervention in the history of PDPH. In this technique 10-20 ml blood of same group (autologous) injected in the epidural space.⁶ PDBP introduced by Gormly in 1960⁷, and observed that PDPH reduced to a significant level after inadvertent bloody taps. Blood patch converted into a clot at the site if tap and stop the leakage of spinal fluid into the epidural space. After this observation, he treated 6 patients of PDPH with EDBP and all were cured.⁸

Another study was conducted by Scavone B et al⁹ on comparison of EDBP with sham procedure, and reported that in both cases there was no complaint about pain after treatment and concluded that both techniques are equally effective. Wong, Ket al¹⁰ conducted a similar study in 2017 and reported remarkable relief. Aim of our study was to investigate the effectiveness of EDBP technique in comparison with conservative management of PDPH, this will be a unique and new gate towards modern treatment modalities of our region.

Patients and Methods

This cross sectional study was conducted in the Department of Anesthesia and Intensive care, Nishtar Medical College Multan. Study was started after approval of ethical review board of institution. Informed consent was obtained after complete information of the study to the patients or their guardians. Patients of 16 years age or more presented with history of PDPH from last 24 hours and not more than seven days were included in the study. Patients with hemorrhagic diathesis, having contraindications of lumbar puncture, and body temperature more than 38° Celsius were excluded from the study. Sample size was calculated through WHO sample size calculator by using 95% confidence interval, 80% power of study and 67% efficacy of patch.⁶

After complete diagnosis and confirmation of EDPH, a 20ml of blood was drawn from the vein of the patient with all aseptic measures. Then blood was injected with epidural needle into the epidural space around spinal tap by consultant anesthetist having experience more than five years. Injection was stopped when patients' complaint

about backache or after the completion of injection. Patient was guided about contraindications like lifting heavy weight for 3 days, bending forward and straightening. Patient's complaint of headache with transdural leak was considered as treatment failure. In case of treatment failure, injection was repeated and named as 2nd patch. This whole procedure was started after failure of conservative treatment of EDPH. Efficacy of treatment was measured on the basis of patients comments about pain relief after PDPH.

Collected Information was entered in SPSS version 23.1 and analyzed for possible results. Mean and SD was calculated for quantitative data like maternal age. Frequency and percentages were calculated for qualitative data such as gender, ASA status and efficacy (good/poor). Chi-Square along with Fisher exact test was used to see effect modification. p-value ≤ 0.05 was considered as significant.

Results

Overall, data was collected from 326 patients. There were 57.1% (n=186) males and 42.9% (n=140) females. Mean age of the patients was 35.32±2.49 years. Large number (90.2%) of patients were between 30-38 years of age. American Society of Anesthesiologists-1 score (ASA-1) and ASA-2 score was noted as 73.3% and 26.7% respectively (Table 1).

Table 1: Demographic characteristics of participants (n=326)

Characteristics	Frequency	Percentage
Gender		
Male	186	57.1
Female	140	42.9
Stratified Age		
30-38 years	294	90.2
39-45 years	32	9.8
Age; Years (mean±SD)	35.32±2.49	
ASA		
ASA 1	239	73.3
ASA 2	87	26.7

Table 2: Comparison of Efficacy between Epidural 1st and 2nd Patch (n=326)

After 2 nd Patch	After 1 st Patch		Total	p-value
	Good	Poor		
Good	246	72	318	0.000
Poor	1	7	8	
Total	247	79	326	

After 1st patch, efficacy of treatment was 75.8% and it was significantly improved (p-value=0.00) up to 97.5% after 2nd patch (Table 2).

After 1st patch, there was no significant association of efficacy with gender, ASA and age (Table 3). After 2nd patch, significant association was found only with age (Table 4).

Discussion

Treatment of PDPH with EDBP is a globally accepted and is a best treatment after failure of conservative management. Sometime one episode is not sufficient and patients need another episode of EDBP. ¹¹ Through our study design we can measure its efficacy more precisely. Days after headache named as incapacitated days. Purpose of EDBP is to reduce the incapacitated days; it may cause low back pain like side effects. After this study, we can estimate real effect of this mode of treatment. ¹² P

Table 3: Association of epidural 1st patch efficacy with effect modifiers (n=326)

Variable		After 1 st Patch		Total	p-value
		Good	Poor		
Gender	Male	142	44	186	0.439
	Female	105	35	140	
Total		247	79	326	
ASA	ASA1	182	57	239	0.447
	ASA2	27	65	92	
Total		247	79	326	
Age	30-38 years	225	69	294	0.220
	39-45 years	22	10	32	
Total		247	79	326	

Table 4: Association of epidural 2nd patch efficacy with effect modifiers (n=326)

Variable		After 2 nd Patch		Total	p-value
		Good	Poor		
Gender	Male	183	3	186	0.220
	Female	135	5	140	
Total		318	8	326	
ASA	ASA1	234	5	239	0.363
	ASA2	84	3	87	
Total		318	8	326	
Age	30-38 years	289	5	294	0.034
	39-45 years	29	3	32	
Total		318	8	326	

DPH is a challenge for surgeons, patients and for anesthesiologists now in these days because it can damage the person's life. Incidence rate of PDPH was reported in many studies from 0% to 70%, most common causes of PDPH include large bore needle (29-G), needle level and design, angle of needle use, patient's age, gender, patients posture at the time of puncture and bed rest duration (less or long). Maximum cases of PDPH were found after ambulatory surgeries as compared to hospitalized patients even in those patients in which needle size and level was the same.

In our results we observed that after 1st patch, efficacy was noted as good in 75.8% (n=247) patients, while after 2nd patch it was good in 97.5% (n=318) patients (Table 3). There was significant difference between the efficacy of 1st and 2nd patch. ($\chi^2 = 17.879$ DF = 1, p value=0.000). Safa-Tisseront et al ¹⁰ conducted a similar study in 2001 and reported 75% complete relief and 18% incomplete relief with 7% treatment failure. About its complications, fever developed in three patients. Williams E et al ¹³ conducted a study in 1999 and reported 34% complete relief after EDBP, 54% incomplete relief and 12% failure. Common complication of this study was back pain that occurred in three patients. Results of our study are comparable with our results showing a better efficacy of this mode of treatment. Banks et al ¹⁴ reported in 2001

67% complete relief and 28% incomplete relief with treatment of EDBP.

In 1993 Taivainen et al reported initial relief in 91% patients and good results of 61 % permanent relief after EDBP.¹⁵ These results show more successful is EDBP than any other mode of treatment. Stride et al reported 90% and 64% initial and permanent relief from pain respectively.¹⁶ Goodman B reported 83% relief from spinal headache. All these results are comparable with our finding.¹⁷

In 2012 Dripps RDet al conducted a study on post dural puncture headache and reported that 54 % of patient's relief their headache within 4 days of treatment given.¹⁸ These findings are comparable to our study. Most of the PDPH occurs after the use of large bore needle, which damages more epidural space, about 16-86% of cases suffered from PDPH after the use of large bore needle.¹⁹ Experience of clinician, also matters, expert clinicians have very small rate of EDPH, about 0.16 to 1.3%.²⁰

In our study, we did not observe complications after EDBP and after second patch 97.5% (n=318) patients show good efficacy of this treatment modality.

Conclusion

Epidural blood patch (EDBP) is a better choice for the treatment of epidural puncture headache (EDPH). If one time it is incompletely effective, its second patch can be considered.

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