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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 lumbar puncture headache (PEDPH). **Methodology:** This cross sectional study was conducted in the department of anesthesia and intensive care Nishtar hospital, Multan and Bahwal Victoria hospital Bahwalpur from August 2018 to April 2019. Collected Information was entered in SPSS computer software version 23.1 and analyzed for possible results. Mean and SD was calculated and presented for quantitative data like maternal age. Frequency (percentages) were calculated and presented for qualitative data such as gender, ASA status and efficacy (good/poor). Post stratification statistical chi square test was used to see effect modification. P value ≤ 0.05 was considered as significant. **Results:** Overall, there were 100% (n=326) patients in this study. There were 57.1% (n=186) males and 42.9% (n=140) females. ASA-1 and ASA-2 noted as 73.3% and26.7% 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 (Table 3).There was significant difference between the efficacy of 1st and 2nd patch. (χ^2 = 17.879 DF = 1, P value=0.000). **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.
Keywords: Headache, Epidural puncture, Blood patch, Effectiveness.
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Introduction:

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

In 85 to 9% of cases PDPH occurs within 2 days (48hours) but complaint may be present immediately after epidural (3). PDPH and its symptoms are self emitting and relieved in 6 to 7 days in 80% of patients. A very few patients complaints PDPH lasting for weeks or months, it may be psychological. PDPH is episodic pain, during its episodes patients may confine to bed and has financial and psychological effects (4).

Many techniques and prophylactic measures like use of Sprotte's needle, needle of small size, direction correction (brevel perpendicular to dura) have been introduced and all are effective in reduction of PDPH (5). After all these modalities if patient still complaint about pain, than 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). EDBP introduced by Gormly in 1960, 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 (7, 8).

A recent study was conducted (9) on comparison of EDBP with sham procedure and reported that in both cases there was no patients complaint about pain after treatment, he concluded that both techniques are equally effective. Safa-Tisseront V et al (10) conducted a similar study in 2001 and reported 75% complete relief and 18% incomplete relief. A very small number of patients about 7% go into failure of treatment. Aim of our study is 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.

Methodology:

This cross sectional study was conducted in the department of anesthesia and intensive care Nishtar hospital, Multan and Bahwal Victoria hospital Bahwalpur from August 2018 to April 2019. Study was started after ethical approval of ethical review board of institution. Informed consent was obtained after complete information of the study to the patients or their guardians. Patients having PDPH from last 24 hours and never from seven or more days long and age 16 years and above were included in the study. Patients with hemorrhagic diathesis, contra indications of lumber puncture, and body temperature more than 38° Celsius were excluded from the study. Sample size was calculated with WHO sample size calculator with CI 95 %, power of study 80% and P efficacy of patch 54%.

After complete diagnosis and confirmation of EDPH a 20ml of blood drawn from vein of the patient with all aseptic measures and injected with epidural needle into the epidural space around spinal tap by consultant anesthetist having experience more than five years. Injection was stop when patients complaint about backache or at the completion of injection. Patient was concealed about contraindications like, lifting heavy weight for 3 days, bending forward and straitening. Patient's complaint of headache with transdural leak was considered as treatment failure and in these cases injection was repeated and named as 2nd patch. This whole procedure was started after failure of conservative treatment of EDPH.

Collected Information was entered in SPSS computer software version 23.1 and analyzed for possible results. Mean and SD was calculated and presented for quantitative data like maternal age. Frequency (percentages) were calculated and presented for qualitative data such as gender, ASA status and efficacy (good/poor). Post stratification statistical chi square test was used to see effect modification. P value ≤ 0.05 was considered as significant.

Results:

Overall, there were 100% (n=326) patients in this study. There were 57.1% (n=186) males and 42.9% (n=140) females. ASA-1 and ASA-2 noted as 73.3% and26.7% respectively. The mean age of the patients was 35.32±2.49 years. There were 90.2% (n=294) patients between 30-38 years while only 9.8% (n=32) patients between 39-45 years of age. (Table 1). 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 (Table 3).There was significant difference between the efficacy of 1st and 2nd patch. ($\chi^2 = 17.879$ DF = 1, P value=0.000) (Table 2). There was no association for the efficacy after 1st patch with gender (p=0.779), ASA (p=0.789) and age (p=0.329). Similarly, no association was found for the efficacy after 2nd patch with gender (p=0.285), ASA (p=0.484) except age (p=0.008), after chi-square was applied.

Table-1: Demographic Variables (n=326)

Characteristics	Frequency	Percentage (%)
Gender		
Male	186	57.1
Female	140	42.9
Total	**326**	**100.0**
Stratified Age		
30-38 years	294	90.2
39-45 years	32	9.8
Total	**326**	**100.0**
ASA		
ASA 1	239	73.3
ASA 2	87	26.7
Total	**326**	**100.0**
Descriptive Statistics		
	Mean±S.D	
Age	35.32±2.49years	

Table-2: Association of Efficacy for 1st and 2nd Patch

After 2nd Patch	After 1st Patch		Total	P-value
	Good	Poor		
Good	246	72	**318**	**0.000***
Poor	1	7	**8**	
Total	**247**	**79**	**326**	
***P-value is statistically significant with Pearson χ^2 = 17.879, d.f=1**				

Table-3: Comparison of Efficacy after 1st and 2nd Patch

Efficacy	Frequency	Percentage
After 1st Patch		
Good	247	75.8
Poor	79	24.2
Total	**326**	**100.0**
After 2nd Patch		
Good	318	97.5
Poor	8	2.5
Total	**326**	**100.0**

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). PDPH 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 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. (χ^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 develop 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 was 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 (15) reported initial relief in 91% patients and good results of 61 % permanent relief after EDBP. These results show more successful is EDBP than any other mode of treatment. In 1999 Vercauteren et al also conducted a study on efficacy of EDBP in management of EDPH and reported 99% initial and 73% permanent relief from this pain. Stride et al (16) reported 90% and 64% initial and permanent relief from pain respectively. Seebacher et al (17) reported 83% relief from spinal headache. These all results are comparable with our finding.

In 2012 Dripps RD et al (18) conducted a study on post dural puncture headache and reported that 54 % of patients relief their headache within 4 days of treatment given. These findings are similar to our findings and study is comparable with 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 matter, expert clinicians have very small rate of EDPH about 0.16 to 1.3% (20).

In our study we didn't observe complications after EDBP as observed in almost all studies of this pattern. In our study after 2nd patch 97.5% (n=318) patients show good efficacy of this treatment modality.

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.

Conflict of interest. Nil

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Authors contributions:

1.Conceived idea, design study, ---------- Dr Hamid Saeed
2. Data collection, Manuscript writing, ---------- Dr Muhammad Zia Ur Rehman
literature review
3. Data collection, Manuscript Writing---------- Dr Samee Javed Bhatti
4. Proof reading, statistical analysis ----------*Dr Aamir Furqan*

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