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REVEALING EFFECTIVENESS OF EPIDURAL DEXAMETHASONE IN PDPH CONDITION

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Abstract:
Objective: *This study was held to assess the efficiency of epidural dexamethasone for preclusion of PDPH (Post Dural Puncture Headache).* ***Study Design:*** *An RTC (Randomized Controlled Trial) study.*
Place and Duration: *We conducted this study for the duration of one year from March, 2018 to February, 2019 in the department of anaesthesia, Services Hospital, Lahore.* ***Material and Method:*** *In our study we selected 108 patients from different departments of the hospital. Equally divided them in two groups, one as study group and second as control group. In study group an intervention was done via a prophylactic dosage of epidural dexamethasone injection in a dose of 02mlwith08mg and in control group 02ml normal saline was inserted via injection at the time of anesthesia along with standard spinal anesthesia. The anesthesia was directed between L3 and L4 (03rd and 04th vertebral spaces) in sitting position. The stander dosage of anesthetic was prescribed as 75mg Lidocaine (05%) and 25mg Fentanyl by using a 25-gauge disposable needle. The prevalence of headache was the issue of our study which was assessed after spinal anesthesia in intervals as within 1st 24 hours, on 3rd day and 7th day.****Results:*** *All selected patients were distributed into two groups as study group and control group and mean age with standard deviation of the patients of these groups was as 32.18 ± 5.64 years and 31.63 ± 6.24 years. Post dural puncture headache was observed in patients of both groups as 07 (12.95%) in control group and 03 (05.55%) in study group. After 3 days of treatment, rate of headache was found considerably high in control group. On assessment of 7th day, rate of post dural puncture headache in control group was found at considerable high value as 20.38% vs 38.90% with P value less than 0.05. The mean pain score was found considerably less in study group with P value as less than 0.05 on 1st and 3rd day via comparison of mean VAS pain scores. On the 7th day assessment found no statistically considerable difference in the average pain value with P value as more than 0.05.****Conclusions:*** *According the findings of our study we found that use of epidural dexamethasone during spinal anesthesia is useful and effective for headache. Therefore, patients who suffer from spinal anesthesia might be suggested epidural dexamethasone to prevent them from headache.*
Key Words: *Spinal analgesia, Post dural Puncture headache, Epidural dexamethasone.*

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INTRODUCTION:

Post dural puncture headache (PDPH) is one of the main problems of lumbar puncture. The pain starts in the forehead and occipital region and observed as a diffuse headache or part of head is the clinical indication of PDPH. The indications of pain are inconstant and turn out to beseverer in standup position and become politer in lying down position. It has some other problems such as nausea, photophobia, stiffness of the neck, tinnitus and hearing loss that are very upsetting for the patients[1].

There are many reasons of post dural puncture which consequently lead to headache. The lumbar puncture can be due to diagnostic purposes, for spinal anesthesia or dural puncture in the process of epidural anaesthesia. PDPH is a common problem of spinal anaesthesia in obstetric and younger patients. It might be a momentary difficulty remaining as from some hours to several weeks with very worse presentation even some time unbearable. It starts within 24 to 48 hours of dural puncture and resolves in few days to weeks. Major factors contributing to incidence and severity of PDPH include patients age and size of dural puncture[2]. To make a puncture in the dura, needle is used for spinal anaesthesia and the leakage of cerebrospinal fluid from the breach is the reason of post dural puncture headache [3]. The physical phenomenon behind the PDPH can be explained as with the leakage of cerebrospinal fluid caused by piercing of needle in durameter drops the pressure which causes the PDPH. The mitigating effect of the fluid vanishes and tension is applied directly to the cranial nerves. The start of post dural puncture headache varies from 01 day to one week [4].Incidence of PDPH after dural puncture is instant, 66.0% patients start PDPH within 2 days and about 90.0% patients start PDPH within 3 days. The occurrence of post dural puncture headache upsurges considerably with repetitive dural punctures. The reduced prevalence was noted with the use of small gauze needle [5].

In spinal anesthesia local anesthetics are used to block the spinal nerves by injecting local anesthetic into the subarachnoid space. the most commonly used method for nerve blocking in obstetrics and gynecology is spinal anesthesia which is easy to do rather than orthopedic and urologic operations. There are many problems related with spinal anesthesia like backache, neurotoxic effect or infection on central nervous system and headache [6,7]. The occurrence of PDPH fluctuates with respect to different conditions like pregnancy and obesity, the incidence is higher in pregnant and obese females[8].Previous data revealed considerable decrease in occurrence of PDPH amongst the patients who were treated with prophylactic intervention of dexamethasone in comparison to control group like in a single-blinded RCT (Randomized Control Trial), the prevalence of PDPH was found to be expressively lesser equated with controls at 24 hours (2.50% vs 12.50%; P=0.016) and at one-week post dural puncture (11.30% vs 32.50%; P=0.001) respectively [9].

Current study was held to evaluate the effectiveness of prophylactic epidural injection of dexamethasone in contrast to control group for prevention of post dural puncture headache and injection site backache after spinal anesthesia.

METHOD AND MATERIAL:

We conducted this study for the duration of one year from March, 2018 to February, 2019 in the department of anaesthesia, Services Hospital, Lahore. Study was started after the permission of ethical committee of the said hospital. Patients were chosen from the different services of the hospital like gynecology, urology, orthopedic and general wards. Total selected patients were 108 in number and were divided into two equal groups as intervention and control with 54 patients in each group. Size of samples was counted through WHO sample size calculator. All selected patients were got in knowledge of the concerns of the study and after that written consent was taken from all of them. On the principle of American Society of Anesthesiology, all selected patients were in class I or class II of ASA and their age was in between of 18 years to 40 years. The cases with bewildering variables such as headache conditions and patients who were previously using steroid were not included in the study to control the mix up effects of these variables on PDPH. Randomly divided all selected patients into two groups through the help from table of random number. Patients were not in knowledge of treatment that either they were treated with normal saline or dexamethasone.

Conducting anesthesiologist of the study were fully in knowledge about usage of medicine. The doctor who assessed the results of patients was also not in knowledge of the placebo or intervention provided to

the patient. It was assured that procedure must be carried out only from single try and in the case, it may not be successful than that patient will be omitted from the study. Therefore, one anesthesiologist was participating in all the processes of spinal anesthesia. Likewise, patients experiencing 2nd anesthetic at some stage in the study period were also omitted.

Treated both the groups with the same standard spinal anesthesia by the particular anesthesiologist. In study group an intervention was made through a prophylactic dose of epidural dexamethasone injection in a dose of 02ml, 08mg.In control group normal saline (02ml) was injected at the time of anesthesia along with standard spinal anesthesia. The anesthesia was managedamongst3rd and 4th vertebral spaces (L3, L4) in resting position. The standardized dose (75mg Lidocaine 04% and 25mg Fentanyl) of anesthetic was administered using a 25-gauge disposable needle. The prevalence of headache was the main consequence of our study and it was evaluated on 1stday, 3rd day and 7th day after spinalanesthesia. The results were calculated by interviewing the patients at these 03 intervals. The force of a headache was assessedthrough10 points of Visual Analog Scale (VAS) ranging from 0-10. Where zeropresenting no pain and 10 demonstrating maximum pain. The intensity of pain was also evaluated on 1st day, 3rd day and 7th day after spinal anesthesia.

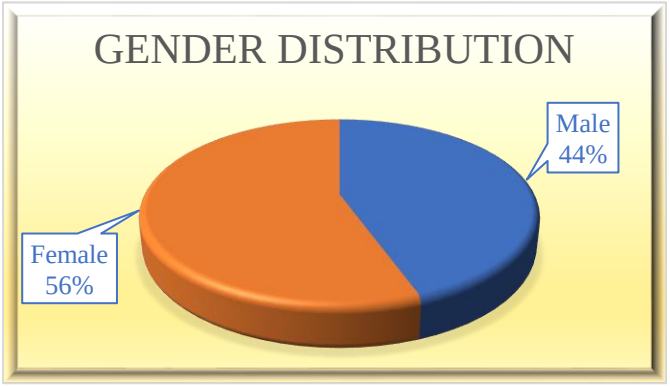
The gathered information was evaluated and examined through SPSS 20. Descriptive data was used to compute M&SD (mean and standard) deviation for quantitative variables and frequency with a percentage for qualitative variables. Used Chi-square teston 1st day, 3rd day and 7th day after spinal anesthesiato compare headache prevalence. The intensity of a headache on the basis of VAS was compared between both the groups. Considered P-value (< 0.05) as significant.

RESULTS:

All selected patients (108) were distributed into two groups as study group and control group with 54 patients in each group and mean age with standard deviation of the patients of these groups was as 32.18 ± 5.64 years and 31.63 ± 6.24 years respectively. Gender distribution of intervention group as males and females were 24 and 30 respectively.

Table No 01: Gender Distribution of Intervention Group

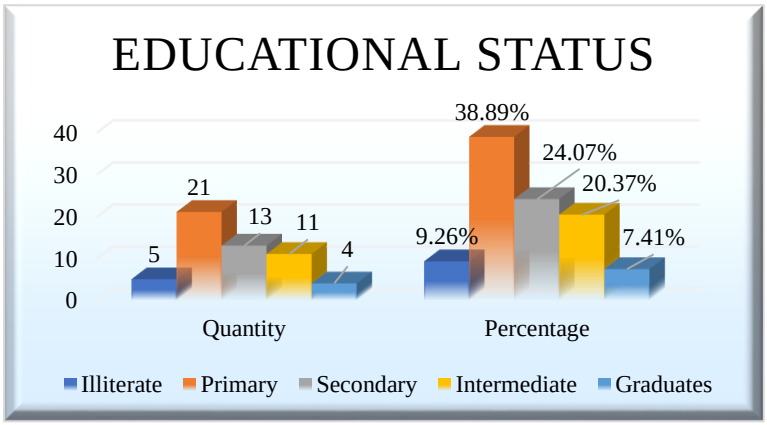
Gender	Frequency	Percentage
Male	24	44.44%
female	30	55.56%



Educational status of patients of intervention group was as maximum patients were having primary education 21 (38.89%), illiterate 05 (09.26%),13 (24.07%) were in secondary status, intermediate education there were 11 (20.37%)and graduates were 04 (07.41%).

Table No 02: Educational Status of Intervention Group

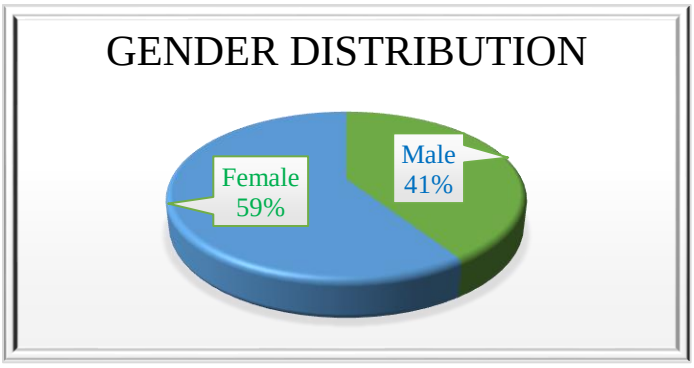
Educational status	Quantity	Percentage
Illiterate	05	09.26%
Primary	21	38.89%
Secondary	13	24.07%
Intermediate	11	20.37%
Graduates	04	07.41%



Gender distribution of control group as males and females were 22 and 32 respectively.

Table No 03: Gender Distribution of Control Group

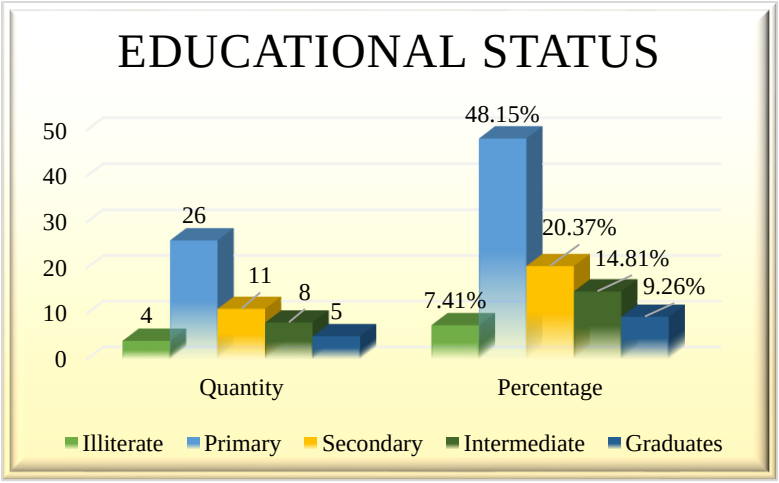
Gender	Frequency	Percentage
Male	22	40.74%
Female	32	59.26%



Educational status of patients of control group was as maximum patients were having primary education 26 (48.15%), illiterate 4 (07.41%), 11 (20.37%) were in secondary status, intermediate education there were 08 (14.81%) and graduates were 05 (09.26%).

Table No 04: Educational Status of Control Group

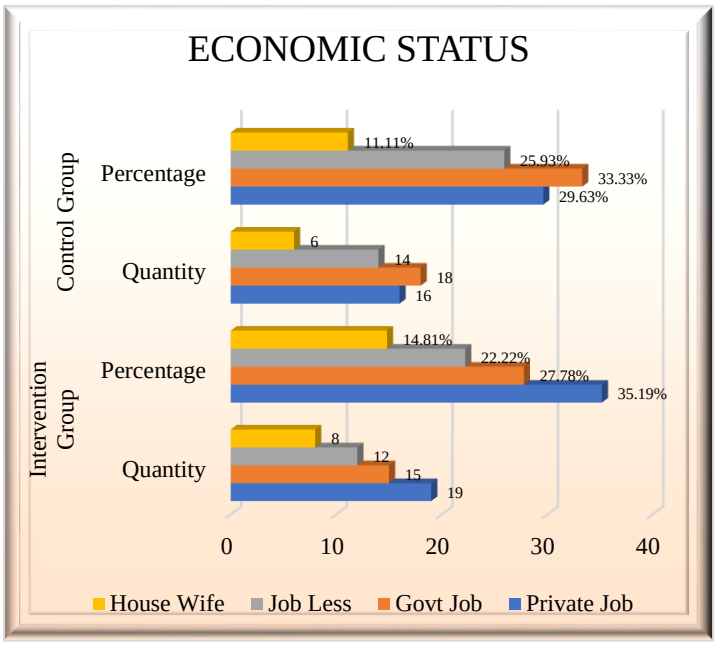
Educational status	Quantity	Percentage
Illiterate	04	07.41%
Primary	26	48.15%
Secondary	11	20.37%
Intermediate	08	14.81%
Graduates	05	09.26%



Economic status of the patients was as in the intervention group patients having private and government jobs were 19 (35.19%) and 15 (27.78%) respectively and in control group patients having private and government jobs were 16 (29.63%) and 18 (33.33%) accordingly. Jobless patients in intervention group were 12 (22.22%) and in control group 14 (25.93%).

Table No 05: Economic Status of Patients in Both Groups

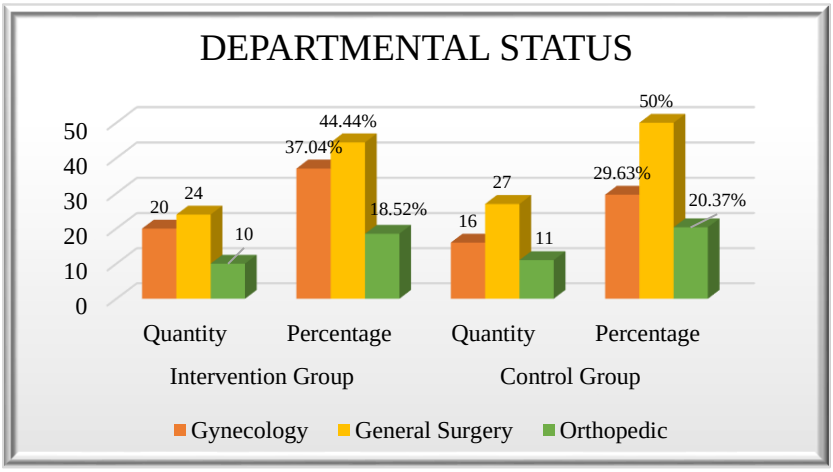
Economic status	Intervention Group		Control Group	
	Quantity	Percentage	Quantity	Percentage
Private Job	19	35.19%	16	29.63%
Govt Job	15	27.78%	18	33.33%
Job Less	12	22.22%	14	25.93%
House Wife	08	14.81%	06	11.11%



All patients were selected from gynecology, general surgery and orthopedicdepartments of the hospital. In the intervention group there were 20 (37.04%), 24 (44.44%) and 10 (18.52%) patientsfrom gynecology, general surgery and orthopedic departments respectively. On the other hand, in the control group there were 16 (29.63%), 27 (50.0%) and 11 (20.37%) patients from gynecology, general surgery and orthopedic departments respectively. Details are shown in table number 06 below.

Table No 06: Departmental Distribution of all Patients

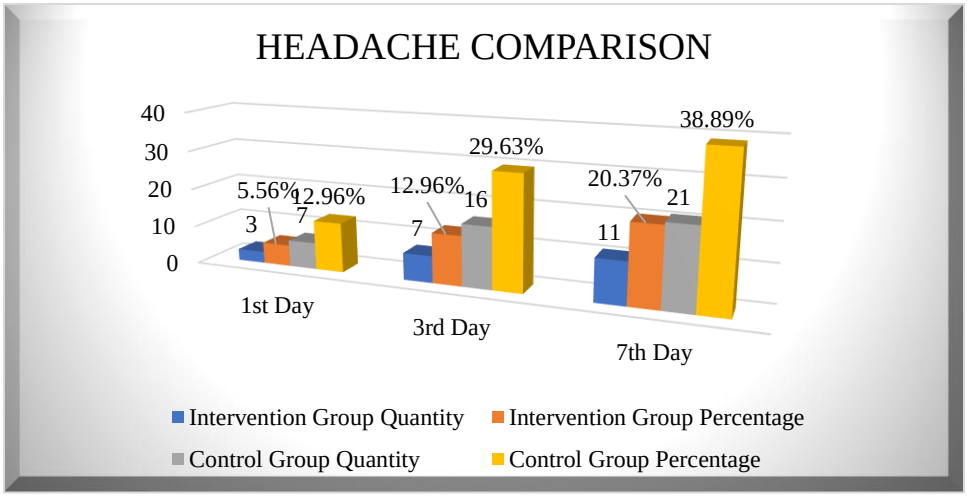
Department	Intervention Group		Control Group	
	Quantity	Percentage	Quantity	Percentage
Gynecology	20	37.04%	16	29.63%
General Surgery	24	44.44%	27	50%
Orthopedic	10	18.52%	11	20.37%



Details of frequency comparison were noted in intervals of first day, third day and seventh day, through which it was noticed that occurrence of post dural puncture headache was there in 3 (5.56%) patients of intervention group whereas, in control group there were 7 (12.96%) patients. Hence, with the P-value of more than 0.05 this difference was statistically not significant. On the third day with 7 (12.96%) patients in intervention group and 16 (29.63%) patients in control group showing a significantly lower rate of a headache with use of epidural dexamethasone, the frequency of headache was observed significantly higher in control group.Likewise, the frequency of post dural puncture headache on07th day was significantly largerwith 11 (20.37%) patients in intervention group and 21 (38.89%) patients in control group with the P-value less than 0.05. Thus, the usage of epidural dexamethasone expressively reduces the post dural puncture headache as explained in table number 07 below.

Table No 07: Comparison of Post Dural Puncture Headache in Both Groups

Analysis Duration	Intervention Group		Control Group		P-value
	Quantity	Frequency	Quantity	Frequency	
1st Day	03	5.56%	07	12.96%	0.184
3rd Day	07	12.96%	16	29.63%	0.034
7th Day	11	20.37%	21	38.89%	0.019



The evaluation of mean VAS pain scores on first day showed that mean pain score was significantly lower with P-value less than 0.05 in the intervention group with a Mean ±SD value of 2.80±1.50 as related with the control group having a mean value of 3.50±1.90. On the basis of VAS, the mean pain score was significantlylower with the P-value less than 0.05 on third day with mean VAS score value of 3.50±2.60 in the intervention group as relatedto control group where mean pain score value was 4.80±2.90. There was no statistically significant difference with P-value more than 0.05 in the mean value of pain score after 7th day of treatment as described below in table number 08.

Table No 08: Comparison of VAS Pain Scores of Both Groups

Analysis Duration	Intervention Group	Control Group	P-value
	Mean±SD	Mean±SD	
1st Day	2.8 ± 1.5	3.5 ± 1.9	0.036
3rd Day	3.5 ± 2.6	4.8 ± 2.9	0.016
7th Day	4.6 ± 2.7	5.4 ± 3.1	0.156

DISCUSSION:

The main disadvantage of spinal anesthesia is the occurrence of post dural puncture headache and the anesthesiologists aretrying to reduce the occurrence of PDPH. For this intention, the diminution of the needle size used for spinal anesthesia exhibited a direct and significant effect on PDPH in previous studies. The occurrence has been observed up to 40.0% with a 22g needle and around 25.0% with a 25g needle. The incidence reduced significantly between 02-12% by using a 26g and less than02% with use of 29g or smaller needle but the use of smaller size needle has very high probabilities of failure because of technical difficulties [10, 11].

Because of dura mater puncture, post dural puncture headache appears as a side effect. PDPH begins in the frontal area and spans out with the time passage and turn out to bevery general. In a few cases this pain spreads to shoulders or neck. The PDPH may become worse because of straining or coughing for the reason that it increases the intracranial pressure. In few cases, as comorbid condition along with PDPH, it might have dizziness or tinnitus, nausea/vomiting, neck stiffness and photophobia [12]

In pregnant women, post dural puncture headache is a noteworthy reason of disease. Even though PDPH is very frequently faced by anesthesiologists and a very general problem of spinal anesthesia but its handling is still controversial and has no standard protocols. Most of the anesthesiologists yet pursue the usual process of treatment for its handling like intense hydration and strict bed rest, even though these procedures have almost no sign of usefulness. The procedures which have verified effective in different randomized control trials like ACTH and gabapentin are not in regular use for controlling of PDPH [13,14,15]

Lumber puncture with a needle used for management of anesthetics is the reason of post dural puncture headache. In PDPH a pin begins in head and upsurges with passage of time in the start till few hours, its

strength augments with upright position of patients and while lying down it reduces. This pain generally disappears suddenly within the duration of 05 days to 07 days. Various interventions are in routine to avoid a headache after spinal anesthesia. These interventions compriseprocedures used formerly, during or instantly after lumbar puncture. However, these interventions are not in frequent use due to improbabilities of their clinical efficiency, particularly about medicine treatments [16]

Pathophysiology of PDPH is still uncertain, numerous medication options have been applied as prophylactic method of treatment for a headache during clinical practices, such as used EBP since it blocks CSF leakage, few body positions are also suggested for preclusion or reducing intensity of PDPH, such as laying upside down allows a seal to form over the dura by reducing pressure in subarachnoid space. Augmented hydration improves the CSF production [17].

The fore most reason of prophylactic use of medicines is to reduce the occurrence of PDPH in patients experiencing spinal anesthesia and to reduce the intensity of headache as much as achievable to evade the necessity of the therapeutic option after its incidence. Hence, this procedure of prophylactic use of drugs enhances the quality of life and considerably decreases the hospital stay with a reduction in possibilities of adversarial proceedings in general.

According to the outcomes of our study it was observed that the post dural headache was very frequent in age period of the thirties with an average age also falling in this age duration. This element was also considered in earlier studies. The low prevalence of PDPH in an old age individual is because of reduction in the elasticity of cranial structures, which happens as a normal aging process, and also a decrease in general pain sensitivity. Likewise, the occurrence of PDPH was more in female patients as compared to male patients. This is reinforced by other studies in the literature through which observed nearly double probabilities of PDPH in women as compared to men [18,19].

Post dural puncture headache generally appears for a few days lasting from 03 days to 07 days. But this duration is inadequate and needs early intervention and handling. Such interventions applied for PDPH treatment compriseinvasive methods and drug therapy. Anextensive range of miserable emotional reactions are linked with PDPH, which may comprise of anger, tears because of painandthe panic condition of the patients. Therefore, the discussion regarding complications with the patients and risk turn out to be very important before the process. In obstetric patients, PDPH is more unfortunate since they supposed to take care of the baby and happiness attributable to the newborn and in this situation, these patients have higher probabilities of anxiety anddepression. It is significant to lend a listening ear of the patients concerning the treatment options, cause of a headache and expected time course for PDPH [20]

In our study it was observed that prevalence of post dural puncture headache was there in 3 (5.56%) patients of intervention group whereas, in control group there were 7 (12.96%) patients. Hence, with the P-value of more than 0.05 this difference was statistically not significant. On the third day with 7 (12.96%) patients in intervention group and 16 (29.63%) patients in control group showing a significantly lower rate of a headache with use of epidural dexamethasone, the frequency of headache was observed significantly higher in control group. Likewise, the frequency of post dural puncture headache on 07th day was significantly larger with 11 (20.37%) patients in intervention group and 21 (38.89%) patients in control group with the P-value less than 0.05. Thus, the usage of epidural dexamethasone expressively reduces the post dural puncture headache.

The prophylactic use of dexamethasone for PDPH is argumentative because of deviation in its outcomes but most of the studies determined that dexamethasone has gooffallouts to reduce the prevalence of PDPH. It was found in an additional study that management of dexamethasone considerably reduces the intensity of PDPH, without disturbing the occurrence of PDPH [21].In an RCT study by Hamzei et al, it was concluded that the occurrence of PDPH was expressively lesser in dexamethasone group at 24 hours as related to control group with a percentage of 2.50% versus 12.50%. it was also observed that the post dural puncture headache was considerably lower in the intervention group as compared to control group (11.30% vs 32.50% with P value = 0.001)[22]. Similarly, Yousaf shashi et al. also observed considerably decreased prevalence of PDPH after 24 hours in dexamethasone group with P value equal to 0.046[23].

Post dural puncture headache has very serious and terrible appearances therefore, it must be considered seriously. When PDPH has occurred, its controlling is very significant and epidural blood patch is cogitated the best procedure, however in severe circumstances, surgical closure is a possibility which

might be selected as the option of last choice.

CONCLUSION:

At the end of our study we concluded that epidural management of dexamethasone during spinal anesthesia is convenient and effective in stopping headaches that follow anesthetic methods. According to the outcomes of this study, intravenous dexamethasone is suggested for inhibition of headaches in cases which experience spinal anesthesia. The outcomes of our research showing that use of dexamethasone expressively decreases the prevalence of pain at first day, third day and seventh day. Likewise, the intensity of pain on the basis of VAS score was also considerably decreased at first day and third day with the use of dexamethasone preventative dosage.

REFERENCES:

1. Wu C, Lian Y, Guan D, Wang L, Miao Y, Xie N. A multicenter clinical study on treating post dural puncture headache with an intravenous injection of aminophylline. Pain Physician 2016; 19:761-5.
2. Beigh Z, Ommid M, Gupta AK, Akhoon S, Qazi S. Post dural puncture headache in ceasarean sections; A study with 25 gauze quincke needle. Pravara Med Rev 2011;3(2):11-6.
3. Choi PT. PDPH is a common complication of neuroaxial blockade in parturients: a meta-analysis of obstetrical studies. Canadian J Anesth 2003;50:460-9.
4. Turnbull DK, Shepherd DB. Post-dural puncture headache: pathogenesis, prevention and treatment. Brit J Anesth 2003;91(5):718-29.
5. Singh J, Ranjit S, Shrestha S, LimbuT, Marahatta SB. Post dural puncture headache. J Inst Med 2010;32(2):30-2.
6. Hamzei A, Basiri-Moghadam M, Pasban-Noghabi S. Effect of dexamethasone on incidence of headache after spinal anesthesia in cesarean section A single blind randomized controlled trial. Saudi Med J 2012; 33(9):948-53.
7. Dranser K, Larson MD. Spinal and Epidural Anesthesia. In: Miller RD, Pardo MC, editors. Basic of Anesthesia. 6th ed. Philadelphia (PA): Elsevier; 2011. p. 270-278.
8. Ahmed SV, Jayawarna C, Jude E. Post lumbar puncture headache: Diagnosis and management. Postgrad Med J 2006;82:713-6.
9. Hamzei A, Basiri-Moghadam M, Pasban-Noghabi S. Effect of dexamethasone on incidence of headache after spinalanesthesia in caesarean section. A single blind randomized controlled trial. Saudi Med J. 2012;33:948–53.
10. Flaatten H, Rodt SA, Vamnes J, Rosland J, Wisborg T, Koller ME. Postdural puncture headache. A comparison between 26- and 29-guage needles in young patients. Anaesthesia 1989; 44: 147-9.
11. Deo GP. Post Dural Puncture Headache. J Chitwan Med Coll. 2013;3(3):5-10.
12. Sen J, Sen B. Noninvasive management of post dural puncture headache - a comparison. Bangladesh J Med Sci. 2014;13(02):114-8.
13. Turnbull DK. and Shepherd DB. Post-Dural Puncture Headache: Pathogenesis, Prevention and Treatment. Br J Anaesth, 2003;91:718-29.
14. Van de Velde, M., Schepers R., Berends N., V and ermeersch E. and De Buck F. Ten Years of Experience with Accidental Dural Puncture and Post-Dural Puncture Headache in a Tertiary Obstetric Anaesthesia Department. Int J ObstetAnesth. 2009; 17:329-35.
15. Nguyen DT, Walters RR. Standardizing management of post-dural puncture headache in obstetric patients: a literature review. Open J Anesthesiol. 2014;4:244-53.
16. Basurto Ona X, UrionaTuma SM, Martínez García L, Solà I, BonfillCosp X. Drug therapy for preventing post-dural puncture headache. Cochrane Database of Systematic Reviews 2013;2: CD001792.
17. Ahmed SV, Jayawarna C, Jude E. Post lumbar puncture headache: diagnosis and management. Postgraduate Medicine 2006;82(973):713-6.
18. Jia W, Fadhlillah F. Blood patch for the treatment of post-dural puncture tinnitus. SAGE Open Med Case Reports. 2018; 6:1–3.
19. Chohan U, Hamdani GA. Post dural puncture headache. J Pak Med Assoc 2003; 53(8):70-8.
20. Afshinmajid S, Davati A, Ahmadand A, Modara F, Moghaddamnia M, Jaberian M. Evaluation of the Effects of Resting in Appearance of Post Lumbar Puncture Headache. Acta MedicaIranica, 2014; 52 (1): 43-45.
21. Doroudian MR, Norouzi M, Esmailie M, et al. Dexamethasone in preventing post-dural puncture headache: a randomized, double blind, placebo-controlled trial. Acta Anaesthesiol Belg. 2011;62:143–6.
22. Hamzei A, Basiri-Moghadam M, PasbanNoghabi S. Effect of dexamethasone on incidence of headache after spinal anesthesia in caesarean section. A single blind randomized controlled trial. Saudi Med J. 2012;33:948–53.
23. Yousefshahi F, Dahmardeh AR, Khajavi M, et al. Effect of dexamethasone on the frequency of postdural puncture headache after spinal anesthesia for cesarean section: a double-blind randomized clinical trial. Acta Neurol Belg. 2012;112:345–50.