

Effect of dexamethasone in reducing headache after spinal anesthesia in Cesarean section

Arazberdi Ghochae¹, Amin Hasanzad², Kazem Kazemnezhad¹ and Seyed Ali Mousavi Mohajer^{2*}

¹Department of Anesthesiology, 5th of Azar Hospital, Golestan University of medical science, Gorgan, Iran

²Student Researchs Committee, Golestan University of Medical Science, Gorgan, Iran

ABSTRACT

Spinal anesthesia causes headache in 1%-15% of patients undergoing caesarean section. A several techniques and materials have been tried to minimize spinal anesthesia-induced headache, with variable results. We compared the efficacy of pretreatment with 0.2 mg/kg dexamethasone before spinal anesthesia for prevention of headache. 100 adult patients, undergoing caesarean section were randomly assigned into 2 groups of 50. Group 1 received normal saline, group 2 received 0.2 mg/kg dexamethasone. Headache was assessed with a four-point scale: 0 = no pain, 1 & 2 & 3 = mild pain, 4 & 5 & 6 & 7 = moderate pain, and 8 & 9 & 10 = severe pain, after caesarean section. In the first group 42 patients (84 %) had no pain and in the second group 47 patients (94%) had no pain. It was not statistically significant (P -value > 0.05). Pretreatment with dexamethasone doesn't prevent of headache associated with spinal anesthesia in patients undergoing caesarean section. We therefore don't suggest routine pretreatment with dexamethasone.

Keywords: Headache, Dexamethasone, Time of hospitalization

INTRODUCTION

Most of the cesarean deliveries in the United States are done with spinal, epidural or general anesthesia. If these steps are done well, the prognosis is good for mother and baby. Headache after Dural puncture, because of the CSF leakage through the holes in Dura, was an early postoperative complication in 15% of patients [1]. Perhaps the definition of spinal anesthesia is unknown for some of the people who are studying this research. Regional anesthesia will be created by injection of a local anesthetic around the spinal nerves coming from the spinal segments to peripheral nerves forming the sensory nerve of a part of the body. In recent years, narcotic substances have been added to local anesthetic compounds to improve the analgesic effect, and some side effects of anesthetic drugs can be reduced. Regional nerve blocks used in deliveries include: [1] lumbar epidural block and cauda equine epidural block [2] subarachnoid block (spinal) and [3] podendal block.

The drugs used for local anesthesia, block the nerves' potential action during axons' contact with drugs. Local anesthetics act through regulation of ion permeability of the cell membrane to stabilize its relaxation potential. The smaller the nerve, more sensitive to anesthetic drugs, because the sensitivity of individual nerve fibers has a reverse corresponds with the transverse diameters of the fibers. Therefore, in regional anesthesia, pain from a gentle touch, pain, temperature, and capacity to control their Vasomotor are weakened sooner and with lower concentrations of the drug (in comparison with realization of pressure or the action of skeletal muscle motor nerves). However

although the autonomic nerve fibers are larger than some sensory nerves, are blocked with the lowest concentration of anesthetic drugs.

Only fully reversible non-irritating least toxic anesthetics are clinically acceptable. Other desirable characteristics of local anesthetics include rapid onset and ease of sterilization. According to the benefits of spinal anesthesia in comparison with other analgesia methods and its low effects, actions are taken part rapidly to reduce the adverse side effects. After spinal anesthesia especially in young pregnant women for cesarean surgery, many side effects such as headache, back pain, nausea, shock are seen, in addition to psychological and physical problems they cause delayed discharge and increase in hospital expenses [1]. The headache can disrupt a patient's life and can take from days to months. The cares to prevent include using a needle with a small size, delay in getting up out of bed and fluid therapy [2]. The transverse needle entry and more holes in the Dura by the needle, increase the probability of headache [3]. In the case of a frontal or occipital headache that increases with movement or sitting, it is known as the headache after spinal anesthesia [4]. The head pain is occurred from 24 to 48 hours after surgery [5]. Headache after spinal anesthesia occurs when a slow leak of cerebrospinal fluid, causes contractions in subarachnoid space and dilated veins in the brain which are sensitive to pain [6].

The syndrome was first described more than a hundred years, yet still studies are ongoing in its pathophysiology, prevention and treatment. Many factors such as age, sex, pregnancy and the size of needle for injection are involved [7]. With increasing age and decreasing diameter of the needle used the incidence of this complication reduces. Needles of small size [25] cause an 8 to 10 percent decrease in the incidence of headache. Recently, with the development of chisel tip spinal needles Sprotte and Whitacker, the incidence of this type of headache is 1 to 2 percent [17]. The headache resolved spontaneously within a few days to a week, but based on the reports, this complication has remained for several months [8]. Treatment in severe cases is injection of 10 to 20 mls of fresh blood from the patient to close the drop defect is Dura [17].

The epidural blood patch (EBP) is mentioned as one of the most effective ways to reduce this kind of headache. This method is usually done with injection of 10 to 20 mls of patient's blood from a Cubital vein [9]. The most common side effects are back pain, diffuse pain and transient bradycardia [8] also caffeine, theophylline, sumatriptan, epidural injection of adrenocorticotropin hormones, morphine and sodium chloride have a positive effect in reducing headache [10].

To solve this problem different studies have been done in and out the country. The effects of hydrocortisone, how expert are the person injecting, and the diameter of the needle, propranolol, cyclizin and dexamethazone are surveyed to decrease the side effect [1, 2, 4, 11, and 12]. According to the psychological problems and also the increase of hospital expenses in patients because of this kind of headache and the results of previous studies on the effect of dexamethazone in the treatment of non-malignant headaches and migraines [13], this study will be done with the purpose of determining the effect of dexamethazone and normal saline on reducing the headache after spinal anesthesia in surgery.

MATERIALS AND METHODS

Written informed consent was obtained from patients and it is explained collecting information from the person remains confidential. This study is an intervention study performed by clinical trial. All women who underwent cesarean in educational and medical center Dezyani in ASA1, ASA2 of Anesthesiology class. The time of preparing the research was from Bahman 1st 1387 to Mordad 1st 1388. Inclusion Criteria patients undergoing cesarean, good cooperation with the team, the patient's informed consent to the study, were our criteria. Exclusion criteria were Unintended and unpredictable effects of injections that may require special treatment.

Women without the proper cooperating in different levels of the study, patients with a history of opiate abuse, drug abuse or alcohol dependence, a history of heart disease, neurological or psychiatric history, history of chronic pain syndrome, vascular disease or any other painful injury or systemic diseases such as diabetes, a history of taking any pain medication and sedatives in the 24 hours before surgery. The sample size for each group was determined to be 50. So that the first is the receiving normal saline group and the second group is the receiving dexamethasone group. Patients were randomly assigned to two groups. Good candidates for regional anesthesia include: Healthy and ripe women and bad candidates including, young women, and mentally unstable or severe medical risks (such as pre-eclampsia - eclampsia, Hypo tension or Hypo volemia).

Excited women, frightened, psychonoresis or psychosis need general anesthesia for surgery. Patients with severe obstetrical, cardiac or respiratory disorders may not be able to tolerate the block regional anesthesia, but if there is an expectation for a long surgery, general anesthesia is less risky. The high amount of anesthetic drugs may put patients at risk. In addition, anxiety disorders after using regional anesthetic drugs and surgery, increases epinephrine secretion and oxygen consumption.

In comparison with a good general anesthesia this usually is a larger threat of cardiac and respiratory exhaustion.. Anesthesiologist will evaluate the patient to determine the relative risks of general anesthesia versus regional anesthesia. For example, some of valvular heart diseases are some contraindications of regional blocks and general anesthesia is more suitable. Woman who is well aware and establish a good relationship with her doctor, is usually a calm and cooperative candidate for regional anesthesia or general anesthesia during early pregnancy the pregnant woman and her husband should be well aware of obstetric anesthesia and caesarean operation (if the conditions are developed). If the pregnant woman has specific concerns about anesthesia or blocking (family history of anesthesia risks, previous surgery on the back, clotting disorders), anesthesiologist could be aware during early pregnancy.

To resolve these concerns, some hospitals have anesthesia and delivery clinic. No sedative, analgesic or anesthetic drugs were used before the study drugs. Total number of the patients was 100 that were randomly divided into two groups of 50. Normal saline perfusion was used in first group. Intravenous dexamethasone 0.2mg/Kg was injected in second group simultaneity or before spinal anesthesia and pain was observed until discharge. Before and after treatment, pain was asked and recorded according to a visual analog scale (VAS) graded from zero to ten [16].

No Pain: Zero Mild: one - two – three Moderate: four - five - six – seven Severe: eight - nine – ten Patients 'answers were recorded by score. It was carried out using SPSS 11.5 and Kay2 software.

RESULTS

Total patients were 100 that were randomly divided into two groups of 50. Headache severity was expressed in the following form. No Pain: Zero Mild: one - two – three Moderate: four – five - six – seven Severe: eight - nine – ten. In the first group which only normal saline was used, 42 patients had no pain or zero (84%), 1 patient had mild pain (2%), 2 patients with moderate pain (4%) and 5 patients with severe pain (10%).

In the second group which dexamethasone was used, 47 patients without pain or zero (94%), 2 patients with mild pain (4%), 1 patient (2%), moderates pain and no one with severe pain (0 %). In Dezyani hospital, all patients are visited by obstetrician and usually are discharged in 12-24 hours after the operation if there is no problem and if there is headache, they are followed until afternoon and they will be discharged after the headache is treated.

In a sample of 100 patients, 11 patients had headache that all were without any pain by afternoon, and were discharged without any wasting time or extra cost than usual. Briefly headache after spinal anesthesia has no effect on the patient's hospital stay and costs. Statistical test was done for the hypothesis. The average age of the control group was 25.9 with SD =41/4 and the average age of the dexamethasone group were 26 with SD: 4.51, the difference between the two groups was not statistically significant, indicating that randomization was well done. And our hypothesis that the severity of headache after spinal anesthesia decreases with the injection of dexamethasone in cesarean patients were not confirmed.

Table 1: Observing the relevance of severity of pain with case group

Treatment method Pain severity	First group Normal saline		Second group Dexamethazone	
	percentage	number	percentage	number
Without pain (0)	% 84	42	%94	47
Mild pain (1-2-3)	% 2	1	%4	2
Moderate pain (4-5-6-7)	%4	2	%2	1
Severe pain (8-9-10)	%10	5	0	0

Table 2: the relevance of pain and comparison group

Pain	First group		Second group		P _ Value
	number	percentage	Number	Percentage	
Yes	42	%84	47	%94	0.1
No	8	%16	3	%6	

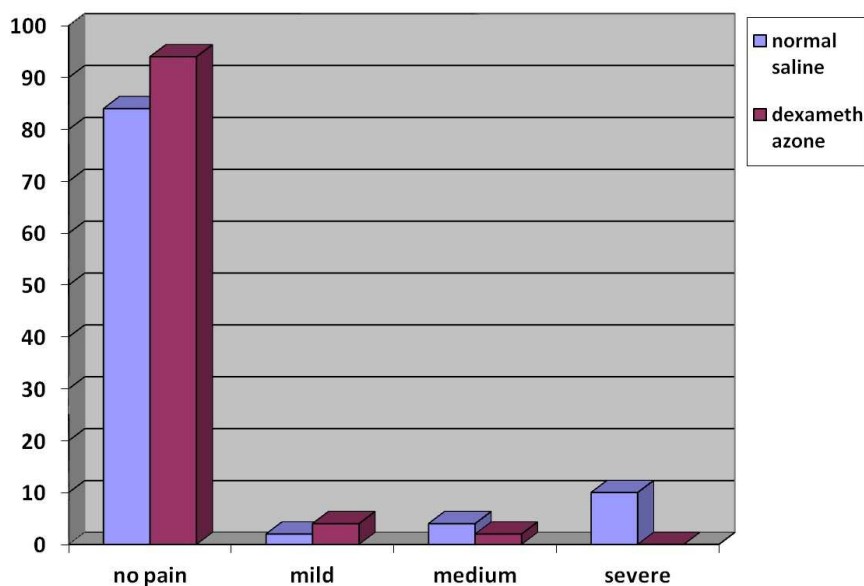


Fig 1: the comparison of the incidence of pain severity in percentage

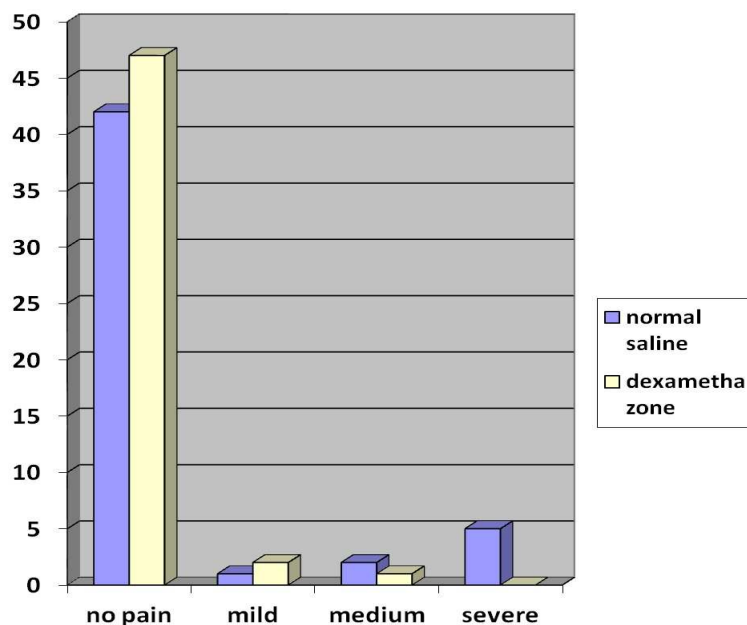


Fig 2: The comparison of the incidence of severity of pain in number

DISCUSSION

After spinal anesthesia especially in young pregnant women for cesarean surgery, many side effects such as headache, back pain, nausea, shock are seen, in addition to psychological and physical problems they cause delayed discharge and increase in hospital expenses [1]. The headache can disrupt a patient's life and can take from days to months. The cares to prevent include using a needle with a small size, delay in getting up out of bed and fluid therapy [2]. The transverse needle entry and more holes in the dura by the needle, increase the probability of headache [3]. In the case of a frontal or occipital headache that increases with movement or sitting, it is known as the headache after spinal anesthesia [4].

The head pain is occurred from 24 to 48 hours after surgery [5]. Headache after spinal anesthesia occurs when a slow leak of cerebrospinal fluid, causes contractions in subarachnoid space and dilated veins in the brain which are sensitive to pain [6]. Recently, with the development of new chisel tip spinal needles, the incidence of this type of headache is 1 to 2 percent [17]. The headache resolved spontaneously within a few days to a week, but based on the reports, this complication has remained for several months [8]. Treatment in severe cases is injection of 10 to 20 ml

of fresh blood from the patient to close the drop defect is Dura [17]. In a study directed by Tavakol and co-workers, using dexamethasone to reduce the pains of spinal anesthesia in cases the pain doesn't get better with the usual medications, causes rapid recovery, rapid discharge, and therefore decrease in hospital expenses [1].

In Nuyan Ashraf and colleagues' study the effects of intravenous hydrocortisone in reducing headache after spinal anesthesia was evaluated in a double-blind study. That shows the positive effect of hydro cortisone in reducing headache in case patients than in the control patients [11]. In a study done by Haghbin and colleagues, results showed that propranolol is more effective than acetaminophen in controlling pain of the headache after spinal anesthesia. Therefore in people who do not have contraindications, propranolol can be used as a treatment for headache after spinal anesthesia [2]. In this study the reason of selecting patients with mentioned conditions was to prevent the possible impact of a systemic disease with side effects on pain.

Another reason was the observance of ethical issues. The first group of 50 patients who received saline alone were used, 42 Bymarbdvn zero pain or pain (84%), 1 Bymarshdt mild pain (2%), 2 patients with moderate pain (4%) and 5 Bymarshdt Drdshdyd (10%), respectively. In the first group (50 patients) which only normal saline was used, 42 patients had no pain or zero (84%), 1 patient had mild pain (2%), 2 patients with moderate pain (4%) and 5 patients with severe pain (10%). In the second group (50 patients) which dexamethasone was used, 47 patients without pain or zero (94%), 2 patients with mild pain (4%), 1 patient (2%), moderates pain and no one with severe pain (0 %).

According to the statistical test done for the hypothesis and not getting the confirmation, is not recommended to use the drug to prevent the headache after spinal anesthesia. Also in our study, the incidence of headache following spinal anesthesia had no effect on the patient's hospital stay and costs. Overall, the researches performed so far revealed if there is a headache after spinal anesthesia, injection of dexamethasone or hydrocortisone reduces the severity of headaches therefore reduces the time and cost of hospitalization. In our study we realized that preventing injection of dexamethazone has no effect on decreasing the incidence of the headache, therefore we recommend not using dexamethazone to prevent the headache after spinal anesthesia. Another thing is that in our study no patient's time and cost of hospitalization as more than usual and according to the similar studied it seems that the reason is small number of the samples and we can come up to better results with increasing the number of the samples.

REFERENCES

- [1] Tavakol, K., Ghaffari, P., Hassanzadeh, A. *J. Yasuj univ. Med. Sci.* **1386**, Vol. 12: 87-94.
- [2] Haghbin, M.A., Mousavi, M.R. *J Yasuj Univ. Med. Sci.* **1383**, Vol. 9: 33-39.
- [3] Roland, D., Miller. *Anesthesia*. 5th edition, Vol 2: 1506-7.
- [4] Mohamadzade juryabi, A., Haghighi, M., Naderi Nabi, B. *J. Med. Dep. Guilan University of Medical Sciences*, **1382**, Vol. 12, Winter, pp. 40 to 44.
- [5] Harvard, *Anesthesia Massachusetts*. Translation of Safai Naieni N. Khoshbin Publications, First published in **1379**, Chapter XVI. Page 232.
- [6] Morewood, GH. A rational approach to the cause, prevention and treatment of postural puncture headache, *CMAJ*. **1993**, 149: 1087-93.
- [7] Kuczkowski, KM. *Minerva Anesthesiol.* **2004**, Vol. 70: 823-30.
- [8] Paul, G., Brash, Bruce F., Cullen, Robert K. *Clinical Anesthesia*, 5th edition, **2006**: 711-12.
- [9] *Principles of anesthesia Estolting - Miller*. Translated by Sultan Mohammadi S. Hayyan Publications. Chapter 12. Page 160.
- [10] Choie A., Laurito, CE. *Ann Pharmacother*, **1996**, Vol. 30: 831-9.
- [11] Novyan Ashraf MA, Sadeghi A, Azarbakht Z, Salehi S, hamediseresht A. *Middle east J. Anesthesiol*, **2007**, 19: 706.
- [12] Nortcliffe, SA., Shah, J., Buggy, DJ. *Br J Anesth*, **2003**, Vol. 90: 665-70.
- [12] Manson, L., Edwards, JE., Moore, RA., McQuay, HJ. *A quantities systemic review, BMC Anesthesia*, **2003**, 3: 4-9.
- [13] Lubusky, M., Berta, E., Prochazka, M., Marek, O., Kudela, M. *Cas lek cesk.* **2006**; 145: 204-8.
- [14] Jahani Shurab, N., Mirzakhani, K., Hasanzade, M. *J. Sabzevar Univ. Med. Sci. & heal. Med. Serv.* 2(36): Summer **1384**, pp. 48.
- [15] Wang, Y.L., Tan, PP., Tang, CH. *Anesth & Analg.* **1997**, Vol. 84: 376-8.
- [16] Women Karnet. Translation of Nader Ghotby. *Teymurzade Pub.* **1379**, Second Edition, 1(26), pp. 657 to 685.
- [17] Elinge CM., Itodo AU., Peni IJ., Birnin-Yauri UA. & Mbongo AN. *Advan. Appl. Sci. Res.* **2011**, 2(4): 279.
- [18] Ameh EG., Akpah FA. *Advan. Appl. Sci. Res.* **2011**, 2(1): 33.
- [19] Ogbonna O., Jimoh WL., Awagu EF., & Bamishaiye EI. *Advan. Appl. Sci. Res.* **2011**, 2(2): 62.
- [20] Yadav, S. S., Kumar, R. *Advan. Appl. Sci. Res.*, **2011**, 2 (2), 197.

- [21] Sen, I., Shandil, A., Shrivastava, V. S. *Advan. Appl. Sci. Res.* **2011**, 2(2): 161.
- [22] Levine, D. M., Sulkin, S. D. *J. Exp. Mar. Biol. Eco.* **1984**, 81: 211-223.
- [23] Gupta N., Jain U. K. *Der Pharmacia Sinica* **2011**, 2(1): 256-262.