

Effect of Sumatriptan on Postdural Puncture Headache

MASOUD GHANEI, KARAMATOLLAH RAHMANIAN,
ABDOLREZA SOTOODEH JAHROMI and REZA SAHRAEI*

Research Center for Social Determinants of Health, Jahrom University of Medical Sciences, Jahrom, Iran
Corresponding author E-mail: sotoodehj2002@yahoo.com

<http://dx.doi.org/10.13005/bpj/997>

(Received: April 01, 2016; accepted: May 19, 2016)

ABSTRACT

Postdural puncture headache has been identified as the common complication of spinal anesthesia due to the leakage of cerebrospinal fluid from dural punctum. The aim of study was determine the effect of Sumatriptan on the prevention of postdural puncture headache. This study was clinical trial that 204 patients participated. Patients were randomly assigned to one of the two equal-sized groups. In the first group, patients were received Sumatriptan, 25 mg orally every 8 hours for 4 doses. They were received the first dose 2 hours before induction of spinal anesthesia. In the second group, patients were received placebo at the same time intervals as the first group. Mean headache intensity was measured using 5-point verbal rating scale before treatment, then every 8 hours for 48 hours. The incidence of postdural puncture headache during 48 hours after induction of spinal anesthesia was 25.49 percent in the cases versus 37.25 percent among control group that was significant difference ($P < 0.05$). The results of present study suggest that prophylactic Sumatriptan significantly decrease the incidence of postdural puncture headache during 48 hours after induction of spinal anesthesia.

Key words: Headache, postdural, Prophylaxis, Sumatriptan,

INTRODUCTION

The most common complication of spinal anesthesia (SA) is headache after spinal anesthesia or Post Dural Puncture Headache (PDPH) (Shah and Thomas 2007). Symptoms include headaches in the frontal or occipital areas starts within 12 to 24 hours after spinal anesthesia that intensified in the standing position and decreased with supine position (Silberstein and Marcellis 1992). On my symptoms include a stiff neck, tinnitus, hearing loss, and nausea named Phoebe photo (Ghaleb 2010).

Headache after spinal anesthesia is often self-limiting process (Segal and Arendt 2010) that was untreated can last from 2 to 14 days (Fernández 1990). The incidence of this complication has been reported 13-32 percent (Shah and Thomas 2007).

Factors that increase the incidence of PDPH are aged between 18 to 32 years, female sex, use a large needle, BMI lower patient, pregnancy and more often dural puncture (Suárez and Macadar , Shah and Thomas 2007).

Many methods have been proposed to prevent PDPH unfortunately often seems useless to arrive (Shah and Thomas 2007, Apfel, Saxena et al. 2010, Zabetian, Jahromi et al. 2013), such as prolonged bed rest, very hydration after spinal anesthesia (Shah and Thomas 2007), prophylactic use of caffeine (Halker, Demaerschalk et al. 2007), cosyntropin (Hakim 2010), prophylactic epidural blood patch (Vasdev and Southern 2001), epidural injection of morphine (Al metwalli 2008).

Sumatriptan is a drug of triptane groups that effective on acute cluster and migraine headache (Katzung and Julius 2001) because of their actions on the brain arteries (Tfelt-Hansen, De Vries et al. 2000). Earlier study of the effect of sumatriptan for the treatment of headache after spinal anesthesia was evaluated on 10 patients. A dose of 6 mg sumatriptan were injected subcutaneously after begin of headache without improvement of headache (Connelly, Parker et al. 2000).

According to the pathophysiology of PDPH (dilation of blood vessels in the brain; Vasodilatation; as the underlying cause, has been much pain (Fernández 1990) and this drug has been used to prevent PDPH decision was taken to carry out this research, according to time on the pathophysiology of this headache during 12 to 24 hours after a spinal anesthesia is (Silberstein and Marcelis 1992) the effect of the drug was studied in the prevent of early PDPH.

MATERIAL AND METHODS

Among patients 20 to 30 years of age who accept their inclusion, as available, 204 are enrolled in the study using randomly divided into two groups.

Because of the age and gender risk factors for headache after spinal anesthesia, and it is also more common in women aged headache, only patients in the study were 20 to 30 years old and was about sex matching, in this way, the sample size of 204, 102 male and 102 female patients were enrolled and randomly selected cases and controls in each group.

Patients

All patients in both groups anesthesiologist once tried to create spinal anesthesia, the injection needle 25 and 80 mg xylocaine 5% in the space between the third and fourth lumbar vertebrae in the midline anesthetic technique were sitting. By the time of the pathophysiology of the headaches that within 12 to 24 hours after the lumbar puncture is, in the case of sumatriptan 25 mg to 4 doses every 8 hours orally to patients were given the first dose of 2 hours before anesthesia (a dose every 8 hours is 25 mg prophylactic sumatriptan) (Newman, Lipton et al. 1998). The control group was given a placebo at the

same intervals. Placebo pharmaceutical company model was prepared containing all the ingredients, except the active ingredient of the drug sumatriptan tablets. Measurement of pain assessment every 8 hours for two days (Hakim 2010) with 5- point verbal rating scale was down (0: No headache, 1: mild headache, 2: moderate headache, 3: severe headache, 4: unbearable headaches).

Intervention

Double Blindness study was conducted in which the headache pills to patients and assessed by the staffs that were unaware of the patient or case. Data were collected by questionnaire.

Exclusion criteria included a history of migraine headache, sensitivity to sumatriptan, symptoms of ischemic heart disease (angina), cerebrovascular disease (stroke, TIA; Transient Ischemic Attack), a history of peripheral vascular disease (ischemic colitis), uncontrolled hypertension, use of derivatives of ergotamine in the past 24 hours, mono amino oxide inhibitors (MAOIs) in the last two weeks, severe liver disease, tried more than once for lumbar puncture for spinal anesthesia, non-cooperative patients, pregnant patients Cesarean surgery, patients with headache prior to anesthesia and patients with headaches criteria IHS (International Headache Society) are to recognize PDPH.

The data were recorded by SPSS, version15. P value less than 0.05 was significant statistically.

RESULTS

In our study, 204 patients were randomly divided into two groups (51 female and 51 male patients in each group). The mean age was 25.6 ± 2.99 in the study group and 25.7 ± 3.22 years in the control group.

The incidence of PDPH in case group decreased for about 12 percent that it in case group (25.49% vs 37.25%; $p < 0.05$) during study (Table 1).

The mean score of headache with 8 hours interval after creating the spinal anesthesia showed

in Table2 without significance between the case and control group ($p>0.05$).

23.5 percent of cases leaving the bed under 6 hours, 18.1 percent between 6 and 12

hours, 6.4 percent between 12 and 24 hours and 2% the more than 24 hours, respectively. The percentages in the control group were 3.8 percent, 23.5 percent, 16.2 percent and 5.1 percent, respectively ($p=0.01$)

Table 1: Incidence of Post Dural Puncture Headache in both case and control groups

Groups	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Cases	12	23.6	14	27.4	26	25.49
Controls	20	39.2	18	35.2	38	37.25

Table 2: Mean headache score in patients during study

	Cases		Controls		P value
	Mean	Standard deviation	mean	Standard deviation	
Before study	0.26	0.78	0.37	0.77	0.089
8 hours	0.27	0.79	0.37	0.76	0.072
16 hours	0.34	0.78	0.44	0.81	0.224
24 hours	0.34	0.67	0.46	0.86	0.435
32 hours	0.34	0.67	0.47	0.83	0.348
40 hours	0.34	0.67	0.38	0.67	0.487
48 hours	1.91	3.73	2.5	4.03	0.280

DISCUSSIONS

Results of our study report the efficacy of oral sumatriptan at a dose of 25 mg every 8 hours for 4 doses for the prevention of PDPH. The drug reduced the bed stay after spinal anesthesia.

Numerous studies have done to find a good way to prevent PDPH. Most of these methods are useless (Apfel, Saxena *et al.* 2010, Zabetian, Jahromi *et al.* 2013). Among them will be a long rest in bed, high hydration after spinal anesthesia (Zabetian, Jahromi *et al.* 2013), prophylactic use of caffeine (Halker, Demaerschalk *et al.* 2007), cosyntropin (Hakim 2010), Prophylactic Epidural Blood Patch (Vasdev and Southern 2001) and epidural injection of morphine (Al metwalli 2008) pointed out.

The previous case reports of patients managed with subcutaneous sumatriptan seem to

support the use of this drug in these patients for treatment of postdural puncture headache (Carp, Singh *et al.* 1994, Green 1997, Hodgson and Roitberg-Henry 1997). The result of present study suggested that oral sumatriptan reduce the risk of postdural headache. Adversely, Connelly *et al.* in 2000, in a study of the effect of sumatriptan for the treatment of PDPH in 10 patients showed that sumatriptan for the treatment of PDPH did not recommend, but researchers have noted that the effectiveness of sumatriptan in the office early this PDPH is not clear (Connelly, Parker *et al.* 2000).

Sumatriptan caused more people spend shorter time in the hospital so that 23.5 % of cases in less than 6 hours to leave his bed , while the amount equal to 18.1 percent in the control group.

In our study had some limitations , a lack of continuing follow-up of patients after 48 hours of creating the spinal anesthesia and the lack of a

separate study of patients who had undergone surgeries them. In summary, based on the results of this study, prophylaxis with oral sumatriptan may be successfully reduce the risk of postdural puncture headache.

ACKNOWLEDGEMENTS

The authors thank Jahrom University of Medical Sciences for the support given to this study.

REFERENCES

- Al metwalli, R.m "Epidural morphine injections for prevention of post dural puncture headache." *Anaesthesia* 2008; **63**(8): 847-850.
- Apfel, C., A. Saxena, O. Cakmakkaya, R. Gaiser, E. George and O. Radke. "Prevention of postdural puncture headache after accidental dural puncture: a quantitative systematic review." *British journal of anaesthesia* 2010; **105**(3): 255-263.
- Carp, H., P. Singh, R. Vadhera and A. Jayaram. "Effects of the serotonin-receptor agonist sumatriptan on postdural puncture headache: report of six cases." *Anesthesia & Analgesia* 1994; **79**(1): 180-182.
- Connelly, N. R., R. K. Parker, A. Rahimi and C. S. Gibson. "Sumatriptan in patients with postdural puncture headache." *Headache: The Journal of Head and Face Pain* 2000; **40**(4): 316-319.
- Fernández, E., "Headaches associated with low spinal fluid pressure." *Headache: The Journal of Head and Face Pain* 1990; **30**(3): 122-128.
- Ghaleb, A. "Postdural puncture headache." *Anesthesiology research and practice* **2010**.
- Green, D. M.. "Sumatriptan and the conservative management of spinal headache." *American Journal of Anesthesiology* 1997; **24**(5): 267-268.
- Hakim, S. M.. "Cosyntropin for prophylaxis against postdural puncture headache after accidental dural puncture." *The Journal of the American Society of Anesthesiologists* 2010; **113**(2): 413-420.
- Halker, R. B., B. M. Demaerschalk, K. E. Wellik, M. Wingerchuk, D. I. Rubin, B. A. Crum and D. W. Dodick. "Caffeine for the prevention and treatment of postdural puncture headache: debunking the myth." *Neurologist-baltimore then hagerstown md-* 2007; **13**(5): 323.
- Hodgson, C. and A. Roitberg-Henry. "The use of sumatriptan in the treatment of postdural puncture headache." *Anaesthesia* 1997; **52**(8): 808.
- Katzung, B. G. and D. Julius. "Histamine, serotonin, and the ergot alkaloids." *Basic and Clinical Pharmacology*. 8th Ed. New York, NY: McGraw-Hill: 2001; 265-288.
- Newman, L. C., R. B. Lipton, C. L. Lay and S. Solomon. "A pilot study of oral sumatriptan as intermittent prophylaxis of menstruation-related migraine." *Neurology* 1998; **51**(1): 307-309.
- Segal, S. and K. W. Arendt. "A retrospective effectiveness study of loss of resistance to air or saline for identification of the epidural space." *Anesthesia & Analgesia* 2010; **110**(2): 558-563.
- Shah, P. and S. Thomas. "Post-lumbar puncture headache." *Hospital Physician* 2007; **43**(6): 51.
- Silberstein, S. D. and J. Marcellis. "Review Article: Headache Associated With Changes in Intracranial Pressure." *Headache: The Journal of Head and Face Pain* 1992; **32**(2): 84-94.
- Suárez, A. and O. Macadar "Vol. 14 nº 2-Jul/ Dec de 2008."
- Tfelt-Hansen, P., P. De Vries and P. Saxena. "A comparative review of pharmacology, pharmacokinetics and efficacy of triptans in migraine." *Drugs* 2000; **6**: 1259-1287.
- Vasdev, G. M. and P. A. Southern. "Postdural puncture headache: the role of prophylactic epidural blood patch." *Current pain and headache reports* 2001; **5**(3): 281-283.
- Zabetian, H., A. S. Jahromi, M. Y. Karami and M. A. Ghobadifar. "Antishivering Effect of Low Dose Meperidine in Caesarean Section under Spinal Anesthesia: A Randomized Double-blind Placebo-controlled Trial." *International Journal of Pharmacology* 2013; **9**(5): 305-311.