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The Evaluation of Post Spinal Anesthesia Nausea and Vomiting Incidence with Lidocaine Versus Lidocaine Plus Epinephrine for Cesarean Delivery in Alghadir Hospital in 2004

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ABSTRACT

The objective of the study was to evaluate efficacy of epinephrine to prevent PONV, rescue medication use, effects on heart rate and blood pressure during and after operation and need for analgesics after surgery. The study was a double blind and randomized clinical trial study and was performed in Alghadir hospital in 2004 on 100 patients based on criteria of study that were admitted for elective cesarean surgery. All of them operated under spinal anesthesia with equal technique. The patients were randomly divided into two groups of 50 people and 50 people randomly received lidocaine alone and 50 people received lidocaine plus epinephrine. Epinephrine had no effects on variables of this study and its controversy in spinal anesthesia, so we do not recommend the use of Epinephrine as a preventor of post operation nausea and vomiting.
Keywords: Epinephrine; Lidocaine; Nausea; Cesarean; Spinal.

INTRODUCTION

Nausea and vomiting is one of the common complications after operation causing an unpleasant situation for a patient as the patients tolerate the pain easier than vomiting and nausea. The prevalence of vomiting and nausea is ranging from 30% to 92% after various operations. The postoperative nausea and vomiting (PONV)control not only make the patient satisfied, but also can reduce the complications, the reduction of hospitalization and the reduction of health costs.

To prevent PONV, various drugs are used including:

Serotonin antagonists (5HT3) such as Ondansetron and Granisetron. Although these drugs are more effective but due to their costly price, their application is limited. These drugs have less effect on nausea and mostly they are antiemetic.

Non-pharmacological methods affecting PONV are Acupuncture Acupressure methods and their complete efficacy is not proved yet.

Epinephrine is one of the public adrenergic agonists used for vascular contraction that increases the length of spinal anesthesia. It seems that by adding it to the local spinal anesthesia drug being injected to subarachonid space, nausea is increased. It is proved that in abdomen surgeries (as 0.1 to 0.2mg; of solution 1: 1000) epinephrine added to lidocaine and Bupivacaine the same as epinephrine added to the solutions of Tetracaine (in terms of increasing the duration of anesthesia) is not effective. Considering the high amount of nausea and vomiting after gynecology surgery and mental, physical and financial injuries inflicted on the patient and the lack of adequate studies on the efficacy of epinephrine on post-spinal nausea, we were attempting to perform a study on the efficacy of epinephrine on post spinal nausea and vomiting in cesarean delivery.

In a study done by Anesthesia department of Washington in 1995 regarding the efficacy of epinephrine on spinal anesthesia with lidocaine, 7 subjects were selected in double blind study. They received 50mg epinephrine with Dexterios 7.5% with or without epinephrine (0.2mg) and the anesthesia and the remaining duration of anesthesia were evaluated and the result of the study was increasing the duration of anesthesia in waist and sacral dermatome and the lack of efficacy in thoracic dermatome. Although using epinephrine is controversy, it can be used in lower body operation.

In a study done by Butterworth, John MD, Brooker, Robert F. MD in anesthesia department of northern Carolina in 1997, regarding the comparison of epinephrine and Phenylephrine for treatment of hypotension following spinal by tetracaine hyperbaric, 13 patients were selected as double blind study and the required evaluations during and after surgery were done. The results showed better and complete efficacy of epinephrine

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compared to Phenylephrine in post-spinal hypotension control and the hypothesis of efficacy of epinephrine due to the effect of its adrenergic α, βmix compared to Phenylephrine that is a pure agonit.

In a study performed by Carpenter in 2003 in Swiss, 952 patients underwent spinal anesthesia and different kinds of surgeries, 18% had nausea during the operation and after the operation. 7% had vomiting. Of this number, 12% received inhalation anesthesia. Epinephrine injection by intra thecal form increased PONV and this is due to the release of Serotonin.

METHOD

Type of study

This study was double blind randomized clinical trial.

The study population

Women at the age of 15-40 years who underwent spinal anesthesia in elective cesarean delivery.

Inclusion criteria of the study

1. ASA class I
2. $20 \leq BMI \leq 30$
3. Anesthesia duration less than 1hour
4. Not smoking cigarette and drinking alcohol
5. Not using effective drugs on the results of the study
6. The lack of effective disease on the results of the study including gastric, bowl disease and motion sickness.
7. Not having the history of Post operative Nausea and Vomiting (PONV)
8. Complete consent of the patient from the inclusion to the study

Exclusion criteria

1. Consuming antiemetic drug within 24h before surgery
2. Using anti-anxiety drug within 24h before surgery
3. ASA class more than I
4. Using hormone drugs
5. Anesthesia duration more than 1h

Research method

According the comments of statistic expert, considering clinical trial to investigate the sample size (based on the incidence of 73% nausea and vomiting after surgery), the required sample size for this study was with test power and standard difference 80% (α=5%) and statistical investigation of chi-squared test, were 100 people, 50 people of control group and 50 people for case group.

Research design method

After the approval of the study in scientifically, practically and ethically, the patients who were admitted under the supervision of the gynecologists for elective cesarean delivery, they were visited the night before the surgery to investigate the inclusion of the study and a brief explanation of the study for the patient and obtaining the written consent for the study.

The patients qualified in the study were randomly divided into two groups.

50 patients received lidocaine and 50 patients received lidocaine plus epinephrine. The variables were investigated by the existing data in the file (by anesthesia form) and interview with the patient after surgery in terms of nausea and vomiting. Before spinal anesthesia 10cc/kg Ringer was injected to all the patients. 5cc ephedrine was given to all intravenously- with spinal needle number 25 in sitting position,2cc lidocaine, 5% injected to first group and lidocaine plus epinephrine injected in subarachnoid space to second group and during operation blood pressure (BP) and heart rate (HR) and pulse oximetery were done and asked from the nausea after surgery.

A statistical calculation was done by SPSS software. The statistical analysis was done by Chi-squared. The statistical data as Pvalue <0.05 were significant.

RESULTS

Surgical history

34% of the study sample had previous surgical history.

34% of the study sample didn't have previous surgical history.

There was no significant difference between two groups in terms of the surgical history.

Pulse oximetery
All people of the case and control groups had equal pulse oximetery with the saturation of O2 (98%-100%).
There was no significant difference statistically between case and control groups in terms of Pulse oximetery.

Gestational age
Case and control groups had term pregnancy (100%).
There was no significant difference statistically between case and control groups in terms of Gestational age.
Surgical duration
All people of case and control group had 45min surgical duration (100%)
There was no significant difference statistically between case and control groups in terms of surgical duration.
Cardiac disease
None of case and control groups had cardiac disease history (100%).
There was no significant difference statistically between case and control groups in terms of cardiac disease.
HTN history
None of the people had HTN history (100%).
There was no significant difference statistically between case and control groups in terms of HTN history.
GI disease
None of case and control groups had GI disease history (100%).
There was no significant difference statistically between case and control groups in terms of GI disease.
Hb
1% of people had Hb of 10.5.
2% of people had Hb of 11.
3% of people had Hb of 11.6.
21% of people had Hb of 12.
22% of people had Hb of 12.5.
28% of people had Hb of 13.
10% of people had Hb of 13.5.
12% of people had Hb of 14.
1% of people had Hb of 14.5.
There was no significant difference statistically between case and control groups in terms of Hb.

Heart rate (HR) during operation
Averagely all people of the study had HR of 75.3.
51% of the people had HR of 60-70 per min.
36% of the people had HR of 71-80 per min.
9% of the people had HR of 81-90 per min.
4% of the people had HR of 91-100 per min.
There was no significant difference statistically between case and control groups in terms of HR during operation.

Heart rate (HR) after operation
47% of the case group had HR of 60-70 per min.
53% of the case group had HR of 71-80 per min.
58% of the case group had HR of 81-90 per min.
17% of the case group had HR of 91-100 per min.
0% of the case group had HR of 101-110 per min.
53% of the control group had HR of 60-70 per min.
47% of the control group had HR of 71-80 per min.
42% of the control group had HR of 81-90 per min.
83% of the control group had HR of 91-100 per min.
100% of the control group had HR of 101-110 per min.
There was no significant difference statistically between case and control groups in terms of HR after operation $<0.05<$pvalue$=0.36$

Systolic BP during operation
10% of people had systolic BP 70-80(mmHg) during operation.
26% of people had systolic BP 81-90(mmHg) during operation.
48% of people had systolic BP 91-100(mmHg) during operation.

10% of people had systolic BP 101-110(mmHg) during operation.
6% of people had systolic BP 111-120(mmHg) during operation.
0% of people had systolic BP 121-130(mmHg) during operation.
6% of people had systolic BP 70-80(mmHg) during operation.
14% of people had systolic BP 81-90(mmHg) during operation.
46% of people had systolic BP 91-100(mmHg) during operation.
24% of people had systolic BP 101-110(mmHg) during operation.
6% of people had systolic BP 111-120(mmHg) during operation.
4% of people had systolic BP 121-130(mmHg) during operation.
There was no significant difference statistically between case and control groups in terms of Systolic BP during operation <0.05<pvalue=0.20

Diastolic BP during operation
70% of people had Diastolic BP 50-60(mmHg) during operation.
26% of people had Diastolic BP 61-70(mmHg) during operation.
4% of people had Diastolic BP 71-80(mmHg) during operation.
0% of people had Diastolic BP 81-90(mmHg) during operation.
52% of people had Diastolic BP 50-60(mmHg) during operation.
34% of people had Diastolic BP 61-70(mmHg) during operation.
12% of people had Diastolic BP 71-80(mmHg) during operation.
1% of people had Diastolic BP 81-90(mmHg) during operation.
There was no significant difference statistically between case and control groups in terms of Diastolic BP during operation <0.05<pvalue=0.182

Systolic BP after operation
60% of people had systolic BP 90-100(mmHg) after operation.
45% of people had systolic BP 101-110(mmHg) after operation.
50% of people had systolic BP 111-120(mmHg) after operation.
100% of people had systolic BP 121-130(mmHg) after operation.
0% of people had systolic BP 131-140(mmHg) after operation.
40% of people had systolic BP 90-100(mmHg) after operation.
55% of people had systolic BP 101-110(mmHg) after operation.
50% of people had systolic BP 111-120(mmHg) after operation.
0% of people had systolic BP 121-130(mmHg) after operation.
100% of people had systolic BP 131-140(mmHg) after operation.
There was no significant difference statistically between case and control groups in terms of Systolic BP after operation <0.05<pvalue=0.48

Diastolic BP after operation
29% of people had Diastolic BP 60-70(mmHg) after operation.
21% of people had Diastolic BP 71-80(mmHg) after operation.
0% of people had Diastolic BP 81-90(mmHg) after operation.
22% of people had Diastolic BP 60-70(mmHg) after operation.
24% of people had Diastolic BP 71-80(mmHg) after operation.
4% of people had Diastolic BP 81-90(mmHg) after operation.
There was no significant difference statistically between case and control groups in terms of Diastolic BP after operation <0.05<pvalue=0.076

Discussion and conclusion

Nausea and vomiting are common complications after the surgery and are created after gynecological operations more than any surgery. In this study, the people of two groups were compatible in terms of the risk of PONV factors such that all the subjects were the women at the age of 17-40 years with no smoking and alcohol history. No Diabetics and gastro-intestinal disease, PONV or motion sickness history. All the subjects were under the equal spinal anesthesia of elective cesarean delivery. The subjects were divided into five groups in terms of age and there was no significant difference between two groups in terms of age. There was no significant difference in terms of BMI.

The people of two groups were similar in terms of some diseases. The type of the surgery was equal in two groups and the anesthesia duration of the people was similar in two groups. In terms of the need to health intervention after operation, 54% of case group were in need of antiemetic drug after the operation and 46% of the control group were in need of antiemetic after the operation. There was no significant difference in terms of the need to antiemetic between two groups.

Generally, there was no significant difference statistically between the variables in case and control groups and considering the compatibility of the people of two groups in terms of the above factors, it can be concluded that the presence or the lack of PONV depended only upon the efficacy of epinephrine but as epinephrine didn't have any effect on the study variables and considering the controversy of consuming this drug in spinal anesthesia, using epinephrine for prophylactic of nausea after spinal is not recommended.

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