

INVESTIGATE THE COMPLICATIONS OF LASER TREATMENT IN PATIENTS UNDERGOING CESAREAN SECTION

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ABSTRACT

Background: One of the significant post-cesarean difficulties is postoperative pain. Laser therapy is one of the practical non-drug methods that have attracted interest recently. Considering the use of laser for relieving pain after cesarean operation, our purpose in this study was to investigate the complications of laser treatment in patients undergoing cesarean operation. **Material and Method:** This prospective double-blinded clinical trial was carried out during 2012-2013. The case group was selected from patients visiting the Imam Khomeini Hospital in Ahvaz for elective cesarean operation. After the Ethical Committee of Ahvaz Jundishapur University of Medical Sciences approved the research, 80 pregnant women who satisfied

inclusion criteria entered the study after written consent was obtained from them. The extent of nausea, vomiting, and hypotension in the patients was evaluated at the end of the radiation. Significance level was set at $p < 0.05$. SPSS 16 was used to analyze the data. **Result:** The two groups were similar with respect to demographic characteristics (age, weight, and height), and there were no significant differences between them in the duration of the operation. Four patients in the case group and three in the control group experienced nausea and vomiting, but this difference was not statistically significant ($p > 0.05$). Moreover, hypotension developed in three patients in the case group and in two patients of the control group, but the difference was not statistically significant ($p > 0.05$). **Conclusions:** .In our study, laser had no effect on nausea and vomiting of patients and this indicates its desirable performance. It is

suggested to use a larger sample size and study other variables in future research so that we can introduce and recommend the results of this procedure with more documented results.

KEYWORDS: low level laser, cesarean, Nausea and Vomiting, Hypotension.

INTRODUCTION

Cesarean section

Cesarean section is the most common operation in the United States with more than one million of this surgical procedure carried out annually in this country.^[1] Cesarean section is the delivery of the fetus through an abdominal and uterine incision. This definition does not include removing the fetus from the abdominal cavity in cases of uterine rupture or abdominal pregnancy.^[2] Cesarean delivery rates in the United States were 5.4% in 1965, 25% in 1988, and 6.27% in 2003.^[3] Based on statistics, cesarean delivery rate in Khorasan Province was 1.28% in 1999^[4] while, based on desirable global statistics, this rate was predicted to be 15% in 2000.^[5] Most cesarean operations have been performed through personal choice so that, in some statistics, only 2.23% cases of cesarean delivery cases have had medical indications and 8.67% of the cases have had other reasons including fear of natural birth pain (59%), fallopian tube blockage (7%), history of abortion or infertility (3.2%), difficult previous birth (9.3%), and other reasons (18%).^[5] Increased cesarean delivery rates add to the economic burden on families in any society so that the costs for nulliparous and multiparous women increase by 1.15 and 20%, respectively. These expenses increase by 10% in cases where epidural anesthesia is required. The cost of unsuccessful natural birth attempt through vagina is only 2% less than the cost of elective cesarean delivery.^[6] This increase in costs is due to longer duration of required hospitalization of the mother and her disability. Costs of short-term and long-term complications in the mother and the fetus, increased incidence of placenta previa, additional diagnostic measures, blood transfusion, and of intensive and careful care required by the mother and the newborn must be added to those mentioned above.^[7] Moreover, the cesarean operation itself is not without risks so that mortality rate of mothers having cesarean operations is 2 to 8 times greater compared to those having vaginal birth.^[8] Furthermore, the next extra-uterine pregnancy, hemorrhage, and hysterectomy after childbirth, allergic reactions to latex, cutaneous endometriosis, adenomyosis, gall bladder diseases, appendicitis, and increased hospital stay are other complications of this surgical procedure.^[9]

Post-cesarean pain

One of the significant post-cesarean difficulties is postoperative pain^[10] that delays the mother's recovery and postpones the start of activities such as sitting, standing up, walking, and personal hygiene. It also delays the first contact between the mother and the newborn, which prevents the beginning of successful breast-feeding and makes it impossible for the mother to take care of herself and her newborn.^[11] It is estimated that pain is relieved insufficiently in 50-75% of the mothers.^[12] Insufficient postoperative pain treatment may have harmful effects, reduces quality of life, and causes problems in sleeping and resting^[13], while sufficient pain relief results in the mother's satisfaction and her faster recovery and allows the mother to start breastfeeding the newborn earlier.^[14] The goal of the Health Institute of the United States for 2010 was to raise the number of breastfeeding mothers to 75%. Moreover, attention is paid to the earliest possible start of breastfeeding in the early hours after birth and to its continuation at regular intervals, but achieving this goal in mothers who have undergone cesarean operations will be accompanied by stresses and complications such as pain at the incision site following the regaining of consciousness after anesthesia. Therefore, creating conditions in which the mother feels less pain and greater comfort and mental calm can play an important role in successful breastfeeding.^[15] Consequently, pain control constitutes a major part of care provided after surgery and postoperative pain is considered the fifth vital sign. At present, analgesics, especially narcotics, are administered after operations. Since taking these drugs is accompanied by complications such as respiratory depression, hemodynamic changes, nausea and vomiting, and urine retention, use of other non-drug methods of pain control can reduce the amount of medicines taken and the complications that follow their use.^[16] Laser therapy is one of the practical non-drug methods that have attracted interest recently.

Laser in cesarean operation

Low power laser was first introduced by Mester et al. who stated low power laser with the energy of 1 j/cm resulted in wound healing in rats.^[17] Low power laser is red or infrared light that stimulates fibroblast proliferation through non-thermal effects, and results of a review study in 2010 showed low power laser could speed up the healing process. Moreover, low power laser has also been suggested as a method for relieving postoperative pain and for accelerating the healing process. The possible mechanisms involved in pain relief include stabilization of nerve cell membrane, increased activity of the cell reduction system, and increased ATP production.^[18] The biological effects of this type of laser were first

concentrated on accelerating recovery from injury effects. In other words, the first application of this laser was to accelerate wound healing.^[19] During the studies that followed, the useful effects of low power laser on the peripheral nervous system attracted interest. In rat samples, use of this laser could speed up the repair of injury inflicted on the facial nerve.^[20] Walker (1983) was the first to show the effect of low power laser on patients suffering from chronic pain.^[21] Considering the use of laser for relieving pain after cesarean operation, our purpose in this study was to investigate the complications of laser treatment in patients undergoing cesarean operation.

MATERIAL AND METHOD

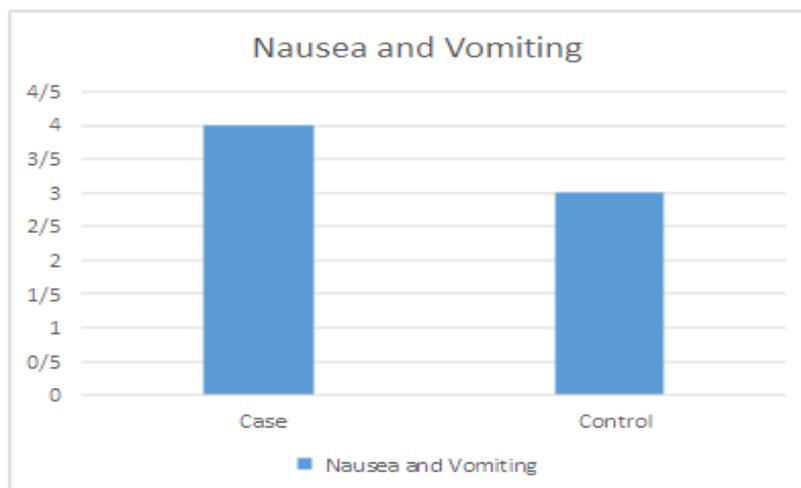
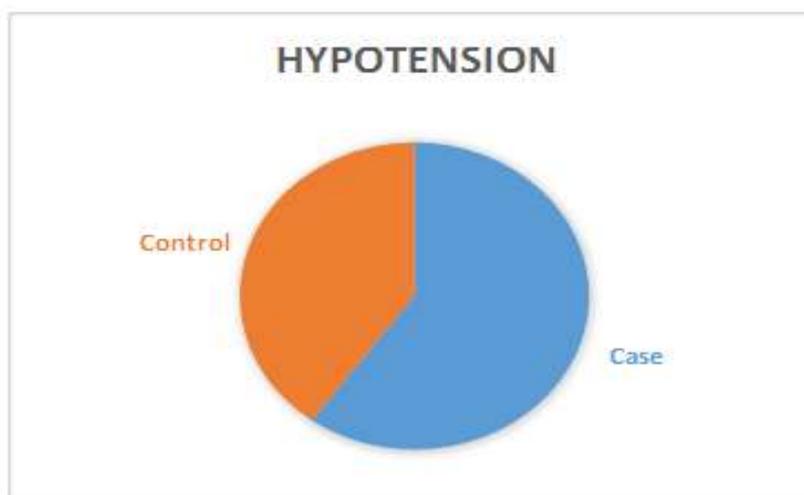
This prospective double-blinded clinical trial was carried out during 2012-2013. The case group was selected from patients visiting the Imam Khomeini Hospital in Ahvaz for elective cesarean operation. After the Ethical Committee of Ahvaz Jundishapur University of Medical Sciences approved the research, 80 pregnant women who satisfied inclusion criteria entered the study after written consent was obtained from them. The inclusion criteria were that this had to be their first or second pregnancy, and they had to fit in American Society of anesthesiologists (ASA) classes I and II. They were randomly divided into two 40-member groups (the laser and the control groups) using a computer-generated list of random numbers. After the operations and the suturing of incisions, and before applying dressing to the surgical site, an anesthesiology expert simultaneously exposed the patients in the laser group to both red and infrared laser (manufactured by the Canadian Optic & Laser Center). None of the patients knew whether the probes were turned on or off, but the doctor treating them who shined the lasers onto them knew which the case group was. Two laser probes were placed at the starting point of the incision and were moved along the length of the incision by skin contact. Each 1-2 cm region was exposed to R laser with the dose of 1j/cm₂ and IR laser with the dose of 2j/cm₂ (a total radiation dose of 3j/cm₂) for 10 seconds. The extent of nausea, vomiting, and hypotension in the patients was evaluated at the end of the radiation. The data was reported in means \pm standard deviation. After analysis of natural distribution of the data and of similitude in variance, the Bonferroni post hoc test, the repeated measure test, and the independent sample t-test were employed to compare the studied groups. Significance level was set at $p < 0.05$. SPSS 16 was used to analyze the data.

RESULTS

In this study, 80 patients were divided into the two laser and control groups. The two groups were similar with respect to demographic characteristics (age, weight, and height), and there were no significant differences between them in the duration of the operation. Four patients in the case group and three in the control group experienced nausea and vomiting, but this difference was not statistically significant ($p>0.05$). Moreover, hypotension developed in three patients in the case group and in two patients of the control group, but the difference was not statistically significant ($p>0.05$).

Table 1. Nausea and Vomiting and Hypotension in Two Groups

Variable	Case	Control	P-Value
Nausea and Vomiting	4	3	P>0.05
Hypotension	3	2	P>0.05

**Fig 1. Nausea and Vomiting in Two Groups****Fig 2. Hypotension in Two Groups**

DISCUSSION AND CONCLUSION

Spinal anesthesia is considered as an appropriate and safe alternative to general anesthesia in many surgeries and especially elective cesarean section. Due to its simplicity, reliability and speed in establishing adequate anesthesia, it is a common technique. Due to the parturient wakefulness during surgery, minimal respiratory depression of the baby and avoiding possible damages caused by general anesthesia and anesthesia intubation, spinal anesthesia in cesarean section is taken into consideration. Among the disadvantages of spinal anesthesia by classic method (with topical anesthetic drugs) are the hemodynamic abnormalities such as reducing blood pressure and the short period of postoperative analgesia.^[22-23] For creating spinal anesthesia, drugs such as lidocaine, bupivacaine, and tetracaine are used. These are in the category of local anesthesia and due to sympathetic block, they entail complications such as drop in blood pressure and heart rate.^[22,24] So, we will obviously observe drop in blood pressure in patients after this operation. However, if other factors aggravate this condition in patients, we will see more undesirable consequences. Therefore, complementary or therapy methods used in surgical procedures, especially in pregnant women and C-section surgeries, must be very safe and without any side effects. In case of increasing this effect, the use of lasers is also undesirable. The results of our study showed that laser has no harmful effect on blood pressure changes in patients which indicates the pleasant result and proper performance of this method. Nausea and vomiting after pain are the most common complications after surgery as reported in more than 66 percent of patients who have had spinal cesarean section.^[25] The risk factors affecting the incidence of nausea and vomiting after surgery are female gender, non-smoking, history of postoperative nausea and vomiting, motion sickness and migraine, low age, and drug use. The mentioned risk factors before and during surgery are general anesthesia, consumption of nitrous oxide, duration and type of operation (abdominal and women surgery).^[25] Nausea and vomiting are usually self-limiting but can cause aspiration of gastric contents, rupture of stitches, subcutaneous emphysema, esophageal rupture and delay in postoperative rehabilitation.^[26] Some of the drugs used to control nausea and vomiting after surgery are dopamine antagonists, antihistamines, anticholinergics, phenothiazines, and corticosteroids. But given the widespread effects of these drugs, today, it is preferable to use serotonin receptor antagonist of 5-HT₃ (subset of tryptamine hydroxy) - as a very effective antiemetic after surgery - to alleviate nausea and vomiting after surgery with less side effects than the above mentioned drugs.^[27] Therefore, like changes in blood pressure, the treatment methods of such complications should also be safe. In our study, laser had no effect on nausea and vomiting of patients and this indicates its desirable performance.

It is suggested to use a larger sample size and study other variables in future research so that we can introduce and recommend the results of this procedure with more documented results.

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