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Amniotic Membrane for Pain Control After Cesarean Section

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Abstract

Objectives: Pain is one of the major problems for patients after cesarean section. The aim of this study was to assess the effect of amniotic membrane as cesarean wound dressing on pain after cesarean section.

Materials and Methods: This study was conducted on 90 pregnant women who underwent cesarean section in Amir-al-Momenin hospital, Gerash, Iran. The participants were divided into 2 groups each of 45. The wound was dressed with amniotic membrane in one group and with simple gauze in the other group. Pain was measured and recorded in the 2 groups by visual analogue scale (VAS). The need for receiving analgesics 24 hours after the cesarean section was also assessed and compared between the 2 groups.

Results: The results showed no significant difference between the 2 groups regarding the mean pain, 4 and 12 hours after the cesarean section ($P=0.308$ and $P=0.628$, respectively). However, a significant difference was observed between the 2 groups, in this regard, 24, 36, and 48 hours after the operation ($P=0.026$, $P=0.026$, and $P=0.004$, respectively). Moreover, the patients in the amniotic membrane group needed less analgesics compared to those in the control group 24 hours after cesarean section ($P=0.041$)

Conclusions: Use of amniotic membrane dressing can be effective in reducing pain after cesarean section and can eliminate the patients' need for analgesics. Hence, it can be used as an effective complementary method along with usual analgesics for pain relief.

Keywords: Cesarean section, Postoperative pain, Analgesia, Amniotic membrane

Introduction

Pain is defined as an unpleasant sensory or emotional experience related to probable or real tissue damage (1). Pain tolerance is one of the most significant post-surgical events for patients, which leads to undesirable physiological, mental, and psychological effects (2). After cesarean section, pain is usually relieved by the use of narcotic analgesics or non-steroidal anti-inflammatory drugs (NSAIDS) (3). However, drug therapy is not the only method for relieving pain, by considering their side effects on the mother, the probability of their transfer to the neonate through breastfeeding, and their cost. Therefore, complementary therapies, such as thermotherapy, cryotherapy, hypnotism, music therapy, aromatherapy, and dressing with honey have been taken into account in recent studies (4,5).

One of the complementary treatments which is used for pain relief is amniotic membrane as wound dressing (6,7). Amniotic membrane is the innermost thin and strong membrane that surrounds the fetus, and has been proposed in previous studies for developing wound healing, including burn wounds (6), vascular foot ulcers (7), diabetic foot ulcers (8), and cornea damages (9). It also has analgesic (6,7), anti-inflammatory (10), and anti-bacterial (11) properties. A clinical study conducted on 46 patients with burn wounds showed that the patients whose wounds were dressed with amniotic membrane felt less pain and needed prescription of less analgesic (6).

Cesarean section is a common surgery all over the world, especially in Iran (12). Considering the increasing rate of cesarean section and the consequent pain that interferes with the mother's caretaking of the neonate and breastfeeding (13) and in order to reduce the use of analgesics, the present study assessed the effect of amniotic membrane as cesarean wound dressing on pain after cesarean section.

Materials and Methods

This randomized controlled double-blind trial was conducted on 90 term pregnant women (38-42 weeks) who had elective cesarean section in Amir-al-Momenin hospital, Gerash, Iran, according to the principles of the

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Declaration of Helsinki. The participants were provided with information about the study protocol and were required to sign written informed consent forms for participation in the study.

Based on the previous studies (5) and considering the significance level of 0.05 and power of 80%, a 90-subject sample size was determined for the study (45 subjects in each group).

At first, 90 pregnant women who had referred to the hospital (between June 30 and August 31 2016) and were qualified to enter the study were divided into the amniotic membrane and control groups using permuted block randomization. The inclusion criteria were gestational age between 38 and 42 weeks, willingness to participate in the study, experiencing the first cesarean section, live and singleton pregnancy, not having any kind of previous surgery, not smoking or consuming alcohol and drugs, and no history of any diseases (such as liver and kidney dysfunction, cardiovascular, respiratory, and neuromuscular diseases, diabetes, and hypertension), and undergoing general anesthesia. In case the surgery lasted for more than 90 minutes or the patients did not cooperate in measuring and recording the pain level, they were excluded from the study.

The study data were collected by a demographic information form, including mother's age, educational level, gestational age, history of abortion, neonate's sex, duration of surgery, duration of NPO before surgery, height, weight, and body mass index (BMI). visual analogue scale (VAS) was used for measuring the level of pain (14). This scale is a ruler graded from 0 to 10 representing no pain and the highest possible pain, respectively. The patients were required to choose a number based on the level of pain they felt. The procedure of assessing and recording the pain level was done 4, 12, 24, 36, and 48 hours after the cesarean section.

The patients under study were hospitalized the night before the cesarean section and were visited by the researcher. After informing them about the study procedure and receiving their written informed consent, the method used for pain measurement was explained to them. In the morning before the surgery, all the mothers under the study were administered 2 g of cephazolin, 50 mg of Ranitidine, and 10 mg of intravenous metoclopramide and all of them were prepared similarly before the operation. In the operating room, the patients were divided into the amniotic membrane and control groups by the gynecologist according to the list of random numbers that was prepared in advance. It should be noted that the patients and the researchers were both blind to the kind of intervention.

All the women under the study underwent operation with general anesthesia and identical drugs. They also received Fentanyl 1 mcg/kg for analgesia during surgery. As postoperative analgesia, morphine 0.15 mg/kg was injected, because the analgesic effect of morphine begins 20 minutes after injection. None of the participants received any additional analgesic drugs. The cesarean section was performed by one surgeon (the third researcher) with a low transverse incision on the uterus and a Pfannenstiel incision on the skin. After the surgery and skin repair with plastic suture and 3.0 nylon threads, identical for all the patients, the wounds of the intervention group were dressed with amniotic membrane. Immediately after birth, a gynecologist separated amniotic membrane from placenta and fetal chorionic membrane of that patient carefully using sterile gloves. After washing gently with normal saline solution and clearing blood from membrane, it was kept in a sterile basin filled with normal saline solution in room temperature (22°C) till the end of surgery (about 30 minutes) without any changes, manipulations or using certain drugs. At the end of surgery, amniotic membrane was removed from normal saline solution and placed, in 2 layers, directly on sutured cesarean section incision in the case group. Fetal surface of amniotic membrane was placed on the sutured wound surface.

In order to prevent the membrane from drying, sterile gauze moisturized with normal saline was placed on the membrane and then, it was dressed with several dry gauzes. In the control group, on the other hand, the wound was dressed with dry gauze after being sutured. Soon after the patients were transferred from the operating room to the ward, they were transcribed with two 100 mg Indomethacin suppositories.

All the patients remained in the hospital for 24 hours. They received intravenous cefazolin 4 g in 4 doses every 6 hours. Afterwards, cephalexin capsules 500 mg were prescribed for them 4 times a day for 7 days. In addition, diclofenac suppositories 100 mg were prescribed for every 6 hours for the first 3 days. The patients were also advised to use mom syrup or bisacodyl suppository, if needed. If they needed extra analgesics (if VAS >5), they received intravenous meperidine 25 mg in the first 24 hours after the surgery. Frequency and dosage of opioids injected in 24 hours after surgery were obtained from the patient records and the nurses' report forms and was recorded on the patients' check list.

The wound pain was described for the patients as a continuous pain in the abdomen in the surgery area. The patients were also informed that this pain was not related to distention. The patients' level of pain was measured by VAS, 4, 12, and 24 hours after the surgery, while the patients were resting in the surgery ward. Besides, the need to receive extra analgesics (intravenous meperidine 25 mg) 24 hours after the cesarean section was assessed in both groups. The 2 groups were also compared regarding the number of the participants who needed analgesics 24 hours after the surgery.

In the first 24 hours after surgery, symptoms of infection were evaluated in both groups. The dressings

in both groups were removed by a nurse, 24 hours after the surgery, and hygienic and nutrition information were given to all the patients. The information included taking the prescribed drugs and analgesics on time, the method of treating the wound, symptoms of wound infection, the need to visit the physician in case of any signs of infection, washing the wound with baby soap after discharge from the hospital and drying the wound afterwards, abstaining from lifting up heavy weights, abstaining from consumption of flatulent food, preventing constipation by consuming fluids and laxative food, and consuming dairy, meat, fruits, and vegetable on a daily basis. In addition, the patients were advised to visit a gynecologist and remove the sutures 8 days after the surgery. They were all contacted by telephone after discharge. Accordingly, all the participants had taken the prescribed drugs and analgesics at the specified time. The level of pain was also inquired and recorded by the researcher's assistant via telephone, 36 and 48 hours after the surgery.

The study data were analyzed using the SPSS statistical software, version 19.0. Chi-square test was used to compare the distribution of qualitative demographic variables, while t-test was used to compare the mean of quantitative demographic variables. In addition, independent t-test was used to determine the mean of pain level. Chi-square test was also used to compare the distribution of the participants who needed analgesics.

Results

This study was performed on 90 patients, 45 in the amniotic membrane group and 45 in the control group. One patient in the control group and 2 patients in the intervention group did not answer the telephone calls; therefore, they were excluded from the study and replaced with 3 other patients.

Demographic and clinical characteristics of the patients are presented in Table 1. In the amniotic membrane group, 48.9% of the newborns were boys and 51.1% were girls. These measures obtained for the control group were as 60% and 40%, respectively. The results showed no significant difference between the 2 groups in regard to the age, education level, gestational age, history of abortion, neonate's sex, NPO time, and duration of surgery ($P < 0.05$). However, a significant difference was observed between the 2 groups concerning BMI ($P > 0.05$) (Table 1).

The results showed no significant difference between the 2 groups regarding the mean level of pain, 4 and 12 hours after the surgery; although the level of pain was lower in the amniotic membrane group ($P = 0.308$ and $P = 0.628$). While, a significant difference was observed between the 2 groups in this regard, 24 hours after the surgery. Accordingly, the patients in the amniotic membrane group had less pain ($P = 0.026$). This difference was also detected 36 and 48 hours after the surgery, revealing a lower level of pain in the amniotic membrane group ($P = 0.026$ and $P = 0.004$, respectively) (Figure 1).

Comparison of the need for analgesics during the first 24 hours after the surgery indicated that the patients in the amniotic membrane group needed significantly less analgesics compared to the control group ($P = 0.041$). It should be noted that none of the intervention group participants had complications related to wound infection.

Discussion

In recent decades, amniotic membrane has been widely used and it has been proven that amniotic membrane is an effective biological dressing for treating many wounds (6-10). In some studies, its analgesic effect has been reported and its effectiveness in decreasing patients' requests for analgesics has been emphasized (6,7). These findings were in agreement with those in the present study. Mermet et al conducted a study on 15 patients with chronic leg ulcers and dressed the patients' wounds with amniotic membrane for one week until they were fully treated. The patients whose wounds were dressed with amniotic membrane felt significantly less pain in the whole treatment period that lasted for 90 days (7). Mohammadi et al also conducted a clinical trial on 124 patients with burn wounds of degrees II and III and showed that the patients whose wounds were dressed with amniotic membrane had less pain and needed prescription of less analgesic (15). In another study, Adly et al compared the

Table 1. Demographic and Clinical Characteristics of the Patients

	Amniotic Membrane Group (n=45)	Control Group (n=45)	*P* Value
Education level (diploma and above)	31 (68.9%)	29 (64.4%)	0.815
Abortion history	7 (15.6%)	6 (13.3%)	0.841
Neonate's sex (male)	22 (48.9%)	27 (60%)	0.290
Age (y), mean ±SD	27.38 ± 3.92	26.62 ± 4.88	0.420
Gestational age (wk), mean ±SD	38.56 ± 1.10	38.73 ± 1.12	0.448
NPO time (h), mean ±SD	7.93 ± 1.39	7.96 ± 1.92	0.950
Operation time (min), mean ±SD	39.40 ± 4.33	39.44 ± 4.47	0.962
BMI (kg/m^2), mean ±SD	30.12 ± 1.16	30.80 ± 1.35	0.012*

Abbreviations: NPO, not per oral; BMI, body mass index.
*$P > 0.05$ is accepted to be statistically significant.

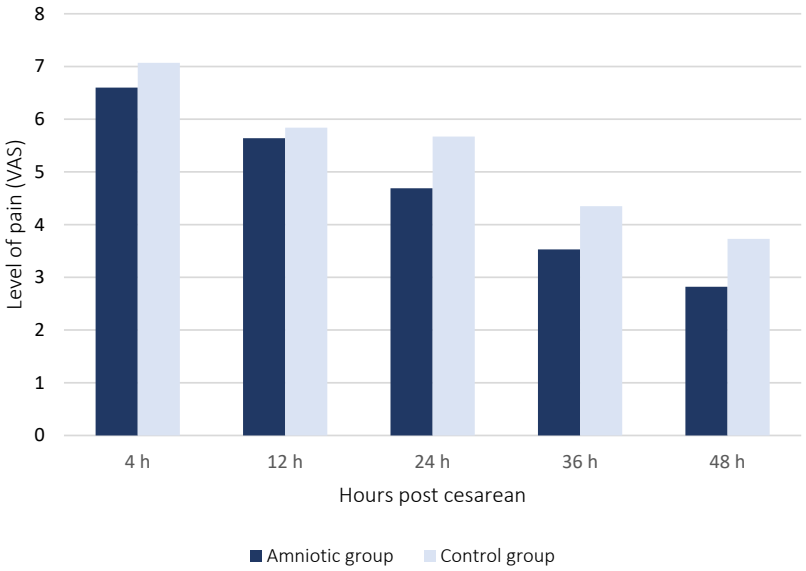

Figure 1. The Patients' VAS Scores.

effects of amniotic membrane dressing and polyurethane dressing in 46 patients with burn wounds. They showed that in comparison to polyurethane dressing, amniotic membrane dressing not only influenced the recovery of the wound, but also decreased the pain score. Thus, they concluded that employing biologic dressing was more economical and decreased the patients' need for analgesics (6). Furthermore, Zelen et al conducted a research on diabetic foot ulcers and indicated that amniotic membrane, as a processed, semiarid, and sterile product, as well as a biological dressing due to its analgesic, anti-inflammatory, and anti-bacterial properties, cytokines, and growth factors was effective in decreasing the pain (8). All these factors can be related to the wonderful effect of amniotic membrane on quick healing of the wounds, causing pain.

Since the amniotic membrane was fresh and was taken from the mother's fetus, its material was preserved and the possibility of transferring infectious diseases, such as AIDS and hepatitis, were minimized. In the present double-blind clinical trial, no significant difference was observed between the 2 groups regarding education level and mean of age. Therefore, these factors had no effects on relieving their pain.

In conclusion, the findings of the current study showed that using amniotic membrane dressing as a complementary treatment could be effective in reducing the pain after surgery. Using this method could eliminate additional expenses and relive patients' pain. Moreover, the need for analgesics was decreased

Conflict of Interests

None to be declared.

Ethical Issues

Before the study, written permission of the Ethics Committee of Gerash University of Medical Sciences (code:IR.GERUMS.REC.1394.1014) and a registration code from the Iranian Registry of Clinical Trials (IRCT) (identifier: IRCT2016040516110N3) were obtained.

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