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## RESEARCH ARTICLE

# Effect of Acupressure on Symptoms of Postoperative Ileus After Cesarean Section

Q8 Faezeh Abadi<sup>1</sup>, Maryam Shehabinejad<sup>2</sup>, Foziyeh Abadi<sup>1</sup>,  
Majid Kazemi<sup>3,\*</sup>

<sup>1</sup> School of Nursing and Midwifery, Rafsanjan University of Medical Sciences, Rafsanjan, Iran

<sup>2</sup> Department of Medical Surgical Nursing, Nursing and Midwifery School, Rafsanjan University of Medical Sciences, Rafsanjan, Iran

<sup>3</sup> Department of Medical Surgical Nursing, Faculty of Nursing and Midwifery, Rafsanjan University of Medical Sciences, Rafsanjan, Iran

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## Abstract

Postoperative ileus (POI) is a common complication after most abdominal surgeries including cesarean section. It is associated with longer hospitalization and increased medical costs. This study is a randomized controlled trial investigating the effect of acupressure, and low-cost noninvasive traditional treatment, on POI symptoms after cesarean section. A total of 120 patients were randomly divided into two groups; the treatment group received two sessions of acupressure (an hour after attending the women's division; and 3 hours after the first session), each lasting 20 minutes. The time of flatus and defecation, time to presence of bowel sounds, and duration of postoperative bed rest were monitored. Patients in the treatment group had a shorter time to presence of bowel sounds compared with those in the control group ( $p < 0.001$ ), as well as shorter time to first passage of flatus ( $p < 0.001$ ) and shorter postoperative bed rest ( $p = 0.005$ ). However, the time to first defecation was not statistically significant ( $p = 0.311$ ). Acupressure has potential positive impacts on attenuating POI symptoms after cesarean section, and can be used as a low-cost noninvasive nursing care to reduce POI incidence and intensity after cesarean section.

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\* Corresponding author. Department of Medical Surgical Nursing, Faculty of Nursing and Midwifery, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.

E-mail: [Maj\\_kaz@yahoo.com](mailto:Maj_kaz@yahoo.com), [Dr.kazemi.n@rums.ac.ir](mailto:Dr.kazemi.n@rums.ac.ir) (M. Kazemi).

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## 1. Introduction

Postoperative ileus (POI) is a very common problem after various types of surgical operations such as abdominal, orthopedic, gynecological, and urologic surgeries. The term ileus refers to a blockage of the intestines that can ensue for both mechanical and nonmechanical reasons. POI has been characterized by abnormal pattern of gastrointestinal (GI) motility, including failure of GI peristalsis [1]. Ileus may indicate different kind of situations, e.g., paralytic intestine, and/or pathologic response of intestine to stimulations and trauma. POI is associated with failure of peristalsis, which leads to accumulation of GI secretions, resulting in abdominal distension, vomiting, and nausea. Consequently, it causes prolonged hospital stay and slow patient recovery [2–5]. Other common complications of POI include bloating, constipation, and difficulties in oral intake of nutrients that are necessary for wound healing and immune function. It is also associated with risk of aspiration and prolonged immobility period, which may lead to pulmonary complications [6].

Patients who are older, male, and have low preoperative albumin, acute, and chronic opioid use, previous abdominal surgery, preexisting airways/peripheral vascular disease, long duration of surgery, emergency surgery, blood loss, and need for transfusion and procedures requiring stomas are at higher risk of developing POI [1]. Previous studies showed that 19% of hospitalized patients undergo the course of POI, which extends their hospital stay by 1.5–5.5 days on average, costing about \$1.46 billion in the United States annually [7]. Specifically, POI occurs in 17% of abdominal surgeries during hospitalization, which increases their costs by 15–29% [6].

A significant number of patients who develop POI are women who underwent cesarean section. In fact, POI is a prevalent complication after cesarean section, associated with abdominal pain and distention, oral intake difficulty, breast feeding disability, and prolonged hospital stay. During cesarean section, excessive amounts of blood and amniotic fluid accumulate in the peritoneum cavity. The accumulation of fluids and the procedure that are performed to drain them may cause disarrangement of the bowel and raise the risk of POI incidence [2,8]. Consequently, some strategies are suggested to prevent POI incidence including chewing gum, carbohydrate loading, and laparoscopic surgery, prescription of nonsteroidal anti-inflammatory drugs, and decreased use of intravenous opioids. With increasing knowledge of POI pathophysiology, traditional treatments are being combined with and directed toward more novel interventions [1]. One form of traditional medical treatment that combines and merges with new medicine is acupuncture.

Acupuncture is a well-accepted traditional Chinese medical treatment and is believed to have existed for at least 4000 years. It is known as an effective treatment option for the management of postoperative nausea and vomiting, and various functional GI disorders [9,10]. Acupuncture is achieved by inserting the tips of thin, stainless steel needles on specific points (called acupoints) through the skin [10]. Conventional acupuncture involves the manipulation of the inserted needles by hand, such as

lifting, thrusting, twisting, twirling, or other complex combinations [11]. If a sharp substance or tip of fingers were used instead of needles to make pressure, it is called acupressure [12]. Acupressure is a noninvasive and safe technique in patients with abdominal surgery [13]. There is a study on the efficacy of acupressure in improving GI disorders, including a study on women after transabdominal hysterectomy, which confirmed that noninvasive acupressure, can significantly improve GI motility [14]. In contrast, some review studies were less conclusive regarding the effectiveness of acupuncture and acupressure for POI. Therefore, further valid and well-defined clinical studies are necessary to confirm the therapeutic effect of acupuncture and acupressure in POI treatment [10,15]. The purpose of this study was to find a noninvasive and cost-effective treatment for POI. To fulfill the study objective, we conducted a prospective randomized controlled study to evaluate the efficacy of acupressure in returning intestinal peristalsis after cesarean section.

## 2. Materials and methods

### 2.1. Study participants

The study was prospectively carried out at Vali-Asr hospital, a university teaching hospital in Iran, from February 2015 to March 2016. The study protocol was approved by the Rafsanjan University of Medical Science Ethics Committee, supported by Rafsanjan University Research Assistance, and registered with irtct.ir number IRCT2016020815965N7.

The inclusion criterion called for women who were candidates for cesarean section. The exclusion criteria were as follows: postoperative use of acute and chronic opioid, age older than 45 years, received spinal analgesia during surgery, having preexisting airways and peripheral vascular disease. However, patients who required stomas, underwent blood loss (>1000 mL) and needed transfusion, had thyroid disorders or nervous, muscular, and hepatic diseases [1] or developed intraoperative problems or complications during cesarean section, including hysterectomy and abnormal bleeding, were excluded from the study.

### 2.2. Study design

A total of 120 cesarean candidates were selected to define the sample size according to the previous studies and simple formula for difference in means (two pairwise comparisons) as follows:

$$n = (s_1^2 + s_2^2) \cdot (z_{1-\alpha/2} + z_{1-\beta})^2 / (x_1 - x_2)^2$$

Patients potentially eligible for the study were informed by the principal investigator about the study details prior to the cesarean section. Informed consent was obtained from all patients prior to their participation in the study. Patients were enrolled in the study if all the inclusion and exclusion criteria were satisfied after the cesarean section. Also, all enrolled patients underwent cesarean section under general anesthesia and have the same mean time of operation. Patients were randomized by the coinvestigator,

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