J Acupunct Meridian Stud 2017;10(2):114–119

Available online at www.sciencedirect.com

Journal of Acupuncture and Meridian Studies

journal homepage: www.jams-kpi.com

RESEARCH ARTICLE

Effect of Acupressure on Symptoms of Postoperative Ileus After Cesarean Section

Faezeh Abadi [1], Maryam Shahabinejad [2], Foziyeh Abadi [1], Majid Kazemi [3,*]

[1] *School of Nursing and Midwifery, Rafsanjan University of Medical Sciences, Rafsanjan, Iran*
[2] *Department of Medical Surgical Nursing, Nursing and Midwifery School, Rafsanjan University of Medical Sciences, Rafsanjan, Iran*
[3] *Department of Medical Surgical Nursing, Faculty of Nursing and Midwifery, Rafsanjan University of Medical Sciences, Rafsanjan, Iran*

Available online 27 December 2016

Received: Jun 17, 2016
Revised: Nov 16, 2016
Accepted: Nov 30, 2016

KEYWORDS
Acupressure;
Postoperative ileus;
Caesarean section

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.

* Corresponding author. Department of Medical Surgical Nursing, Faculty of Nursing and Midwifery, Rafsanjan University of Medical Sciences, Street Gomhory, Rafsanjan, Iran.
E-mail: Maj_kaz@yahoo.com, Dr.kazemi.n@rums.ac.ir (M. Kazemi).

pISSN 2005-2901 eISSN 2093-8152
http://dx.doi.org/10.1016/j.jams.2016.11.008
© 2017 Medical Association of Pharmacopuncture Institute, Publishing services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

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 irct.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:

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

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,

who is also an experienced acupuncturist (using simple block randomization method), to receive either acupressure or no acupressure in a 1:1 ratio (each group contains 60 patients). In a simple block randomization method, we had four unit blocks, wherein for each unit, two patients in the acupressure group and two patients in the control group were entered. Two groups were homologized in demographic data and surgical and postoperative details (Table 1). The analyzer was the only person who was blinded to the treatment of patients. The treatment group underwent two sessions of acupressure: for the first session, 1 hour after transferring of patients with normal status to the women's division; for the second session, 3 hours after the first session (Fig. 1).

2.3. Interventions

For the acupressure group, the acupoints including Zusanli (stomach meridian ST-36) and Hegu (large intestine meridian IL-4) were selected based on previous studies (Fig. 2) [9,15]. Each session of acupressure lasted for 20 minutes (i.e., 10 minutes for each point), performed in a nonclockwise direction by moderate pressure of the pollex finger. All individuals in the treatment group received acupressure at the right side of the body. The control group just received conventional medical care, without having any acupressure-type treatments.

Table 1 Demographic data and surgical and postoperative details.

	Acupressure	No acupressure
Number of patients	60	60
Age, mean ± SD (y)	28.85 ± 4.3	28.2 ± 4.8
Body mass index, mean ± SD (kg/m^2)	29 ± 3.1	30.3 ± 6.4
Gestational age, mean ± SD (wk)	37.9 ± 0.9	38.1 ± 1
Surgical time, mean ± SD (min)	61.5 ± 4.7	60.4 ± 3.1
Opium drugs used during anesthesia, mean ± SD (mg)	9.15 ± 1.5	8.95 ± 1.95
Normal saline serum used during anesthesia, mean ± SD (mL)	0.72 ± 0.25	0.79 ± 0.25
Ringer serum used during anesthesia, mean ± SD (mL)	0.98 ± 0.20	0.95 ± 0.16
Non opium sedative used during anesthesia, mean ± SD (mg)[a]	238.3 ± 80.4	271.7 ± 1.1
Pulses after surgery, mean ± SD (pulse/min)	80.9 ± 5.5	84 ± 5.2
Body temperature after surgery, mean ± SD (°C)	36.5 ± 0.4	36.6 ± 0.4
Systolic pressure after surgery, mean ± SD (mmHg)	107.25 ± 7.3	110 ± 9.9
Diastolic pressure after surgery, mean ± SD (mmHg)	68 ± 8.6	69 ± 8.2

Vital signs were measured, about an hour after the patient enters in the ward.
SD = standard deviation.
[a] The difference in "nonopium sedative used during anesthesia" is not significant as the unit is mg.

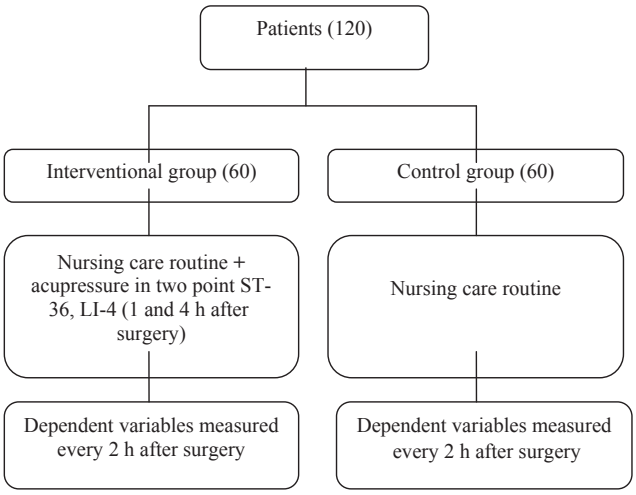

Figure 1 Diagram of materials and method.

2.4. Main outcome measures

The following measurements, which can be the markers of intestinal motility and bowel function, were taken in this study: the time to first defecation, time to first passage of flatus, time to presence of bowel sounds, and duration of postoperative bed rest [1,9]. The presence of bowel sounds was investigated in time intervals of 2 hours in four quadrants, and to shrink the feasible error, the criterion was the presence of three bowel sounds in a minute [15]. The three other outcomes were measured as the interventions were implemented in acupressure group for both groups. Follow-up observations were continued until recording of all four outcomes.

2.5. Statistical analysis

The effect of acupressure treatment on returning a normal bowel function was compared between treatment and control groups using *t* test for parametric data and Mann–Whitney *U* test for nonparametric data. A *p* value less than 0.05 was considered statistically significant. According to a randomized controlled trial on cesarean section, the mean time to first defecation after surgery was 32.2 ± 7.2 hours and 28.1 ± 6.4 hours in the intervention and control groups, respectively [8]. With the assumption of $Z_{\alpha/2}=1.96$, $Z_{\beta}=1.28$ for 90% power (2 pairwise comparisons), a sample size of 60 patients was needed in each group (120 patients in total).

3. Results

A total of 120 cesarean candidates were selected for the study, which was conducted between February 2015 and

Acupoint	Anatomical location
ST-36	3 cun below the lower border of the patella. 1 finger breadth lateral to the anterior crest of the tibia, in the tibialis anterior muscle.
LI-4	On the dorsum of the hand, between the 1 and 2 metacarpal bones, approximately in the middle of the second metacarpal bone on the radial side.

A

B

C

Figure 2 The acupoints used in this study. (A) Anatomic locations of the acupoints. One cun is the distances between the two ends of the creases of the proximal and distal inter phalange joints of the patient's index finger when flexed. (B) Zusanli, stomach meridian ST-36. (C) Large intestine meridian, LI-4 [9].

March 2016; of this total, eight patients who had unusual blood loss (>1000 mL) during the operation and required transfusion or opium sedative postoperatively because of extreme pain, were excluded after the surgery. To obtain the exact sample size, eight new patients who fulfilled the study criteria were added to the study. Finally, 120 patients were randomized to receive either acupressure (treatment group, 60 patients) or no acupressure (control group, 60 patients). The study groups were similar with respect to demographic data and surgical and postoperative details (Table 1).

Table 2 summarizes the outcome measures for both treatment and control groups. Compared to the control group, the acupressure group had significantly shorter time to first passage of flatus (17.7 ± 6 hours vs. 25.75 ± 9.1 hours; $p < 0.001$) and time to presence of bowel sounds (6.2 ± 1.6 hours vs. 12.6 ± 2.4 hours; $p < 0.001$). Additionally, the acupressure group showed significant improvement in the duration of postoperative bed rest compared to the control group (14.2 ± 4 hours vs. 16.2 ± 5.1 hours; $p = 0.005$). However, the time to first defecation was not statistically significant (25.9 ± 5.9 hours vs. 29.1 ± 10 hours; $p = 0.3$).

Table 2 Outcome measures of acupressure versus no acupressure groups.

	Acupressure ($n = 60$)	No acupressure ($n = 60$)	p
Time to first defecation (h)	25.9 ± 5.9	29.1 ± 10	0.311
Time to first passage of flatus (h)	17.7 ± 6	25.75 ± 9.1	<0.001
Time to presence of bowel sounds (h)	6.2 ± 1.6	12.6 ± 2.4	<0.001
Duration of postoperative bed rest (h)	14.2 ± 4	16.2 ± 5.1	0.005

Data are presented as mean ± standard deviation. Two groups were compared using t test for parametric data (second outcome) and Mann–Whitney U test for nonparametric data (first, third, and fourth outcomes).

4. Discussion

POI is a frequent complication after abdominal surgeries, causing an increase in duration of hospital stay. Cesarean section, one of the most common surgeries in women, is frequently associated with POI, which leads to abdominal pain, difficulties with oral intake of required nutrients, flatulence, and inability to breastfeed and nurse newborn effectively. It has been reported that establishing strong connection between the mother and the newborn through skin-to-skin contact (Kangaroo Care) improves the mental and physical development of the child [16], whereas POI is associated with increased bed rest, which impairs the chance of building this connection. So, it is important to find the effective and standard care to accelerate the healing process in mothers and reduce the duration of postoperative bed rest.

The effect of acupressure in normalizing bowel motion after POI is not clear yet, and there is no publication in the English literature that deals with this subject. Therefore, the results were compared with studies on other types of surgeries and acupoints with a focus on limitations and previous suggestions.

In this study, acupressure at acupoints ST-36 and LI-4 shortens the time to first passage of flatus ($p < 0.001$), which is consistent with the results of Hsiung et al [17], who investigated the effect of acupressure on postoperative comfort of gastric cancer patients following a subtotal gastrectomy; however, it should be noted that they used acupoints ST-36 and PC-6 daily for 3 consecutive days. In addition, Hsiung et al's [17] study did not show significant results for time until first defecation, which again is similar to our result ($p = 0.3$). One possible explanation is that women do not take food orally 12 hours after cesarean section and when they resume eating, the type and amount of food intake varies among them. Additionally, the sample size may not be large enough to demonstrate the possible relation of treatment with time until first defecation. In addition, another study conducted by Tseng et al [18] showed that using acupressure at ST-36 reduces the time to first passage of flatus and improves abdominal bloating in patients with hemicolectomy, suggesting acupressure as an effective nursing

care to decrease flatulence; however, more studies are needed to confirm this result [18].

Furthermore, two studies by Chao et al [13] and Chen et al [14] investigated the influence of acupressure in different patients, and at various acupoints, including ST-36 in patients with colorectal cancer after surgery, and PC-6, SP-6, and ST-36 on patients with hysterectomy, respectively. These studies looked at the effect of treatments on bowel motion, which completely confirms our findings; however, in both studies the investigators acknowledged that the sample size was not adequate [13,14].

In a key study by Garcia et al [19], the role of acupuncture in preventing prolonged POI (PPI) among cancer patients undergoing ileostomy/colostomy closure was examined. Their results did not show any significant relationship between outcome and several factors such as time to return of bowel motion. One possible explanation is that acupuncture and acupressure are more effective in acute cases, for example, surgeries than chronic ones. This hypothesis will be investigated in future studies. One of the limitations of Garcia et al's [19] study was the use of epidural anesthesia in most patients, which can interfere with the possible effects of acupuncture by blocking the afferent and efferent neural pathways; thus, we used it as an exclusive criterion in the current study.

In their study, Ng et al [9] found that electroacupuncture (EA (is more effective than acupuncture in stimulating early return of bowel function and reducing postoperative analgesic requirements after laparoscopic colorectal surgery. One limitation they mentioned was the use of opium painkillers because opium sedatives are able to influence the GI system and aggravate POI; therefore, we excluded these groups of patients in our study [9,20,21].

Two important indications were set to recognize the resolution of POI: first, the time tolerance diet; and second, the time to recovery of GI function involving time to first defecation, time to first passage of flatus, and time to presence of bowel sounds [22] (although it was stated passage of flatus is insensitive [23]). However, the first indication can be easily manipulated by the attending clinician and has bias because patients can potentially influence the result, which augments the bias [9]. Duration of postoperative bed rest was another indicator showing more rapid improvement in patients [6,24].

Selection of acupoints in our study was based on expert consensus and previously published human studies [9,17,25]. Moreover, an animal study among rats showing EA at Zusanli, ST-36, increased colonic transit and stimulated distal colonic motility via parasympathetic and cholinergic pathways in conscious rats [26]. A second acupoint was chosen based on published human studies confirming that using LI-4 alleviates abdominal pain [9]. It is noteworthy that because acupressure sections were performed by a coinvestigator without using a device and spending 10 minutes for each acupoint, using more acupoints may become long-lasting and therefore uncomfortable for the patients, so use of more acupoints was not logical as a nursing care recommendation.

Our study had several limitations. First, patients did not eat for 12 hours after the surgery because the patients were non per oral (NPO), but a few of them used gum to resolve dry mouth, and now chewing gum is considered a new method for treating POI. Comparison of acupressure and chewing gum will be a subject of further research [8]. Second, some of the patients did not cooperate in the assessment of bowel sounds because of surgical cuts; thus, we inevitably assessed the bowel sounds with a delay of 0.5—1 hour. Third, a number of patients required blood transfusion because of a decrease in hemoglobin, and they must be excluded because of a possible synergetic effect causing POI [1]. We suggest that synergetic effect of LI-4 and ST-36 and doing acupressure with more sections with shorter time intervals on the clinical outcomes after cesarean section will be important topics for further research, considering that the study by Chang et al [27], which investigated the effect of SP-6 acupressure on POI among abdominal hysterectomy patients, supported the idea that acupressure performed at shorter time intervals and more section is more effective [27]. In addition, comparison of EA and acupressure or comparison of early and late acupressure sections on improving POI and return of bowel function can be investigated in the near future.

The transformation of our findings and those of related studies to a nursing care protocol will be considered cost-effective because of the decrease in health spending—it saves more money in comparison with other POI reduction methods or POI treatment methods using drugs and extended duration of hospital stay. In addition, this is less labor-intensive and only a single trained acupuncturist is required.

5. Conclusion

In conclusion, this randomized controlled trial study suggests that acupressure at certain acupoints including Zusanli and Hegu is able to reduce the time to return of bowel function after cesarean section. So it has a preventive role. Acupressure at above-mentioned points is also effective in the prevention or moderation of POI complications after abdominal surgeries including cesarean section. Further studies are necessary to validate and generalize our findings.

Disclosure statement

The authors declare that there is no conflicting interest.

Acknowledgments

We deeply thank the research council of Rafsanjan University of Medical Sciences (IR.RUMS.REC.1394.189), which financially supported this study. We also thank all the staff of the women's section of Vali-Asr hospital, and Doctor Alireza Heiran for valuable advice during the study.

References

[1] Bragg D, El-Sharkawy AM, Psaltis E, Maxwell-Armstrong CA, Lobo DN. Postoperative ileus: Recent developments in pathophysiology and management. *Clin Nutr*. 2015;34:367—376.

[2] Stewart D, Waxman K. Management of postoperative ileus. *Am J Ther*. 2007;14:561—566.

[3] Mattei P, Rombeau JL. Review of the pathophysiology and management of postoperative ileus. *World J Surg*. 2006;30:1382—1391.
[4] Baig MK, Wexner SD. Postoperative ileus: a review. *Dis Colon Rectum*. 2004;47:516—526.
[5] Vather R, Trivedi S, Bissett I. Defining postoperative ileus: results of a systematic review and global survey. *J Gastrointest Surg*. 2013;17:962—972.
[6] Iyer S, Saunders WB, Stemkowski S. Economic burden of postoperative ileus associated with colectomy in the United States. *J Managed Care Pharm*. 2009;15:485—494.
[7] Goldstein JL, Matuszewski KA, Delaney C, Senagore A, Chiao E, Shah M, et al. Inpatient economic burden of postoperative ileus associated with abdominal surgery in the United States. *P&T*. 2007;32:82—90.
[8] Farideh A, Monayere P, Atiyeh M, Fateme TS, Mohamad V. The effect of chewing gum in prevention of ileus after cesarean. *Hayat*. 2007;2:35—40.
[9] Ng SS, Leung WW, Mak TW, Hon SS, Li JC, Wong CY, et al. Electroacupuncture reduces duration of postoperative ileus after laparoscopic surgery for colorectal cancer. *Gastroenterology*. 2013;144:307—313.
[10] Yin J, Chen JD. Gastrointestinal motility disorders and acupuncture. *Auton Neurosci*. 2010;157:31—37.
[11] Beal MW. Acupuncture and acupressure. *J Nurse Midwifery*. 1999;44:217—230.
[12] Kaviani M, Ashoori M, Azima S, Rajaei FA, Hadian FM. Comparing the effect of two methods of acupressure and ice massage on the pain, anxiety levels and labor length in the point LI-4. *J Shahid Sadoughi Univ Med Sci*. 2012;20:220—228.
[13] Chao H-L, Miao S-J, Liu P-F, Lee H, Chen Y-M, Yao C-T, et al. The beneficial effect of ST-36 (Zusanli) acupressure on postoperative gastrointestinal function in patients with colorectal cancer. *Oncol Nurs Forum*. 2013;40:E61—E68.
[14] Chen L-L, Hsu S-F, Wang M-H, Chen C-L, Lin Y-D, Lai J-S. Use of acupressure to improve gastrointestinal motility in women after trans-abdominal hysterectomy. *Am J Chin Med*. 2003;31:781—790.
[15] Wang M, Gao Y-H, Xu J, Chi Y, Wei X-B, Lewith G, et al. Zusanli (ST36) acupoint injection for preventing postoperative ileus: asystematic review and meta-analysis of randomized clinical trials. *Complement Ther Med*. 2015;23:469—483.
[16] Ferber SG, Makhoul IR. The effect of skin-to-skin contact (kangaroo care) shortly after birth on the neurobehavioral responses of the term newborn: a randomized, controlled trial. *Pediatrics*. 2004;113:858—865.
[17] Hsiung W-T, Chang Y-C, Yeh M-L, Chang Y-H. Acupressure improves the postoperative comfort of gastric cancer patients: a randomised controlled trial. *Complement Ther Med*. 2015;23:339—346.
[18] Tseng Y-L, Hsu C-H, Tseng H-C. Using acupressure to improve abdominal bloating in a hemicolectomy patient: a nursing experience. *Hu Li Za Zhi*. 2015;62:96—102.
[19] Garcia MK, Skibber JM, Rodriguez-Bigas MA, Chang DZ, Feig BW, Bisanz AK, et al. Acupuncture to prevent prolonged postoperative ileus: a randomized controlled trial. *Med Acupunct*. 2008;20:83—88.
[20] Kurz A, Sessler DI. Opioid-induced bowel dysfunction: pathophysiology and potential new. *Drugs*. 2003;63:649—671.
[21] Holzer P. Opioids and opioid receptors in the enteric nervous system: from a problem opioid analgesia to a possible new prokinetic therapy in humans. *Neurosci Lett*. 2004;361:192—195.
[22] Tan EK, Cornish J, Darzi AW, et al. Meta-analysis: alvimopan vs. placebo in the treatment of post-operative ileus. *Aliment Pharmacol Ther*. 2007;25:47—57.
[23] Bungard TJ, Kale-Pradhan PB. Prokinetic agents for the treatment of postoperative ileus in adults: a review of the literature. *Pharmacotherapy*. 1999;19:416—423.
[24] Waldhausen J, Schirmer BD. The effect of ambulation on recovery from postoperative ileuse. *Ann Surg*. 1990;212:671—677.
[25] Wan Q. Auricular-plaster therapy plus acupuncture at zusanli for postoperative recovery of intestinal obstruction. *J Tradit Chin Med*. 2000;20:134—135.
[26] Iwa M, Matsushima M, Nakade Y, Pappas TN, Fujimiya M, Takahashi T. Electroacupuncture at ST-36 accelerates colonic motility and transit in freely moving conscious rats. *Am J Physiol Gastrointest Liver Physiol*. 2006;290:G285—G292.
[27] Chang SB, Kim YR, Yoon MH, Shim JU, Ko EH, Kim MO. [Difference in time of bowel sounds and passing of gas in abdominal hysterectomy patients having San-Yin-Jia (SP-6) acupressure]. *Taehan Kanho Hakhoe Chi*. 2004;34:1164—1171.