

Effectiveness of carum carvi on early return of bowel motility after caesarean section

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ABSTRACT

Ileus is a major problem after surgery. It is painful, causes abdominal distension, delays resumption of oral intake of food and recovery and increases the duration of hospitalization. According to Iranian traditional medicine principles one of the causes for ileus is accumulation of gas in the intestines. The present study investigated the effect of the Carum carvi plant, a gas solvent, on resumption of bowel motility after Cesarean section. This was a randomized controlled pilot study conducted on 20 women undergoing elective caesarean section under general anesthesia. The patients were randomly divided into two groups. The intervention group (Group A) drank 10 ml of Carum carvi syrup containing 2 g of Carum carvi in 20 ml of syrup at 8 to 8¹/₂ hours after surgery. The control group (Group B) consisted of 10 patients who drank 10 ml of the placebo syrup at 8 to 8¹/₂ hours after surgery. Demographic characteristics, time of first peristaltic sounds, first gas passage, first bowel movement, and time until hospital discharge were compared for the two groups. Patients in both groups were of similar age and BMI, had the same number of previous pregnancies, and fasted for similar periods of time before surgery. They had surgeries of similar length, received similar care before and after surgery, and were given the same anesthesia. The results showed that compared to the control group, the intervention group had significantly shorter mean interval of the first intestinal sounds (10.0 ± 2.03 h vs. 19.28 ± 3.95 h); mean time to first passage of flatus (15.91 ± 3.73 h vs. 26.82 ± 5.83 h), mean time to first bowel movement (20.31 ± 4.63 h vs. 31.7 ± 10.2 h) and mean length of hospitalization (31.71 ± 7.57 h vs. 50.6 ± 16.49 h) (*p* < 0.05). There were no serious side effects associated with consumption of the syrup. The use of a gas solvent such as Carum carvi after caesarean section can speed the resumption of post-operative bowel motility.

Key words: Ileus, Caesarean section, Carum carvi, Iranian traditional medicine

INTRODUCTION

Caesarean section is one of the most common surgical procedures in women. Recent studies in Iran indicate that 45.5% of women give birth via caesarean section [1]. One side effect of this delivery method is decreased or delayed return of bowel motility after surgery, which is a problem that has not been addressed sufficiently [2]. Typically, obstetricians do not introduce oral intake of food to the patient after caesarean section until bowel function returns. This is defined as bowel motility, passing gas, bowel movement, and feelings of hunger [3].

Delaying the resumption of oral food intake can negatively affect the production of mother's milk and breastfeeding and requires intravenous nutrition, which lengthens hospital stays and increases the cost of post-operative care. It also increases the rate of cellular breakdown, delays healing, and increases the likelihood of infection [4].

The delay in resumption of oral intake of food stems from the belief that early oral intake can worsen postsurgical ileus [5]. Ileus is a common and unpreventable consequence of abdominal surgeries that is not life threatening, but significantly increases morbidity [6]. Ileus is the absence of peristalsis without mechanical obstruction. Post-operative ileus is delayed return of regular bowel motility after surgery lasting at least 5 days after laparotomy or 3 days after laparoscopy [7,8]. It is associated with abdominal distension, decreased peristaltic sounds, decreased passing of gas and bowel movement, worsening pain, anorexia, nausea and vomiting, and delayed oral intake [5,8,9,10]. Its other consequences include malnutrition, increased risk of nosocomial infection, pulmonary complications, deep venous thrombosis, and decreased patient satisfaction [5,6].

There is no specific known method to prevent and treat post-operative ileus [5]. Methods in current use are nasogastric suction, early oral intake [11], intravenous fluids [10], regional analgesia, decreasing intravenous drug use, minimizing manipulation of the intestine during surgery, use of cyclooxygenase inhibitors, non-steroidal anti-inflammatory medication and oral consumption of fluids with high carbohydrate content [12,5,9]. Recent studies have suggested chewing gum as a strategy to decrease ileus, but the effectiveness of this method remains unproven [13,14]. In promotion of maternal and infant health, the World Health Organization has initiated the study of traditional treatments for ileus to discover methods of shortening the length of time for return of bowel motility after Caesarean section and decrease the length of hospitalization.

The scientific approach to the study of medicine and disease by Iranian scientists over the centuries makes studying traditional medical texts a sensible approach to discover new treatments for complicated diseases.

Avicenna was a great philosopher and an outstanding physician and scientist. His medical text, commonly referred to as *The Canon of Medicine*, was a compendium of medical knowledge of the time based on clinical experience, testing and observation, and the historical writings of prominent physicians. Avicenna believed that describing the causes of disease helps to find different and more successful methods of treatment. Investigations have shown that using medical performing trial with medicaments recommended by traditional medicine increase the likelihood of discovering new effective treatments [15]. Traditional Iranian medicine has precisely described the major contributors to ileus and offers a variety of treatments. In traditional medicine, ileus is called ilavoos. Physicians of traditional medicine consider ileus to be a form of colic, except that colic usually manifests itself in the colon, but ileus is symptomatic in the small bowel and is more serious than colic [16,17,18]. There are different causes of colic or ileus, but postsurgical ileus appears to originate from a gas production of the intestines which is due to a loss of sensation in the bowels caused by relaxant and anesthetic drugs. As a consequence, the colon loses its excretory power and intestinal paralysis is established [19]. It appears that the use of remedies that disperse the abdominal gas produced in the digestive tract can quicken the return to bowel motility.

The transmission of herbal and non-herbal medication through the breast milk to the infants of mothers who deliver by Caesarean section limit the focus of the study only to those medications which do not have negative side effects for mother or infant. These remedies should also be the most effective in the dispersal of intestinal gas and in stimulating bowel motility. In this respect, Carum carvi (caraway) was chosen as the most appropriate drug based on the levels recommended by Iranian books of traditional medicine and permitted PDR levels for nursing mothers. An oral medication containing Carum carvi was prepared as syrup to be evaluated in clinical trials.

MATERIALS AND METHODS

This research is a randomized controlled trial which was performed from 22 December 2013 until 22 January 2014 on 20 women undergoing elective caesarean section with general anesthesia in Sari Hospital in the city of Sari, Iran. This study was begun after obtaining consent for the methodology from the Deputy of Research and approval of the Medical Ethics Committee of Tehran University of Medical Sciences.

The criteria for inclusion were fasting for at least 8 h before surgery, gestational age of 38 to 42 weeks, good vital signs in mother and infant, no uncommon complications during surgery, no medical or gynecological disorders such as hypothyroidism, diabetes, and neuromuscular disorders. Patients with postoperative complications such as uterine atony, those requiring more than 4 doses of antibiotic therapy, patients with intraoperative complications (severe adhesions, excessive manipulation of the intestine, blood transfusion and injury to bowel or bladder) and surgery lasting more than 90 min or those who had received heavy doses of sedatives were excluded.

Immediately after surgery, those patients who fulfilled the inclusion criteria and had given a written consent before the operation were divided randomly into Groups A and B using an odd and even random table. The 10 patients in Group A (intervention group) were instructed to slowly drink 10 ml of a syrup containing 2 g Carum carvi 8 h and once again 10 ml, 8¹/₂ h after the surgery. The 10 patients in Group B (control group) were ordered the same, using placebo syrup instead. Both groups received similar routine care after surgery.

The researcher listened for postsurgical peristaltic sounds in both groups every 60 min until the first bowel sounds were heard. Intestinal symptoms such as nausea, bloating, pain, cramping, vomiting, and bowel motility were controlled every 60 min. The patients and their relatives were instructed to record the time of the first gas passage, bowel movement, bowel motility, and time of discharge from hospital in the check list provided by the researchers. The data recorded was analyzed using SPSS-17 software and descriptive and analytical statistical tests (chi-square, t-test, ANOVA, paired comparison). In this study, $p < 0.05$ was considered to be statistically significant.

RESULTS

Of the 20 patients who participated in this pilot study, mean age was 29.14 ± 5.14 yrs in Group A and 28.72 ± 4.65 yrs in Group B. There was no significant difference between groups in terms of age, education, body mass index, number of previous pregnancies, duration of operation and fasting time prior to surgery (Table 1).

Table 1 . Demographic and baseline characteristics of the study groups

| Variables | Group A (n = 10) | Group B (n = 10) | P value |
|--------------------------------|---------------------|---------------------|---------|
| Age (yr) | 27.9± 6.4 | 28.56± 6.2 | 0.49 |
| Body mass index | 29.7± 4.7 | 30.7± 4.1 | 0.25 |
| Number of previous pregnancies | 1.68± 1 | 2± 1.2 | 0.165 |
| Operation time(min) | 42.29± 11.01 | 45.2± 12.8 | 0.707 |
| Fasting duration(hr) | 11.62± 1.79 | 10.81± 3.06 | 0.096 |

The mean time for detecting the beginning of peristaltic sounds by auscultation, first passage of flatus, first bowel movement, mean time of hospital stay showed significant difference in group A versus group B (Table 2).

Table 2 .Primary outcome measures in the study and control groups

| | Group A (n = 10) | Group B (n = 10) | P value |
|-------------------------------|---------------------|---------------------|---------|
| PO intestinal sound heard(hr) | 10.0 ± 2.03 | 19.28 ± 3.95 | 0.001 |
| PO passage of flatus(hr) | 15.91 ± 3.73 | 26.82 ± 5.83 | 0.004 |
| PO passage of motion(hr) | 20.31 ± 4.63 | 31.7 ± 10.2 | 0.037 |
| PO hospital stay(hr) | 31.71 ± 7.57 | 50.6 ± 16.49 | 0.028 |

DISCUSSION

No previous studies have evaluated the efficacy of Carum carvi or its plant family for stimulating intestinal motility after caesarean section. To our knowledge, the present study is the first clinical trial to investigate the effectiveness

of *Carum carvi* in reducing the recovery time of bowel motility in women after caesarean section. The findings of the present research were compared to those of other studies which have investigated the effect of early oral food intake after caesarean section and the effect of chewing gum on the resumption of bowel motility. The findings of this study showed that the results of Group A were significantly different from those of Group B for mean time first peristaltic sounds, mean time of first passage of flatus, mean time of first bowel movement after caesarean and time to discharge from hospital. Abd-ul-Mayboud *et al.* examined the effect of chewing gum on the return of bowel motility and reported the mean time of first peristaltic sounds being 10.9 ± 2.7 and 15.8 ± 3.7 hrs in the intervention and control groups respectively. In the intervention group, the mean time of the first gas passage was 17.9 ± 4.6 hrs versus 24.4 ± 7.1 hrs in the control group. The mean time for the first bowel movement was 21.1 ± 4.7 hrs in the intervention and 30 ± 8.2 hrs in the control group. In the intervention group, the mean time for hospital discharge was 40.8 ± 10.6 hrs versus 50.5 ± 8.9 hrs in the control group was [14]. In this study, all patients had received general anesthesia which was similar to that of the present study. In the present study, the mean difference between first peristaltic sounds in Groups A and B was about 9 hrs. Since recovery of bowel motility is affected by different factors, this difference appears to be important.

Weinstein *et al.* administered liquids by mouth 6 hrs after surgery and heard the first peristaltic sounds after 10.3 hrs in the intervention group and after 14.4 hrs in the control group [20]. These findings are consistent with those of the present study, but the difference between the intervention and control groups was greater in the present study. Adupa *et al.* recorded a mean time of first peristaltic sounds in their early oral intake group of 32.2 hrs for the intervention group and 24.2 hrs in the control group [21]. Kovavisarach *et al.* reported the first peristaltic sounds at 28.7 hrs in the intervention group and 25.5 hrs in the control group [22]. In these two studies, the mean time to first peristaltic sound was higher than in other studies. The difference appears to be related to differences in the surgical conditions between countries. Satji *et al.* examined 32 women post Cesarean section for the effect of chewing gum after surgery and reported a 15.5 hrs difference for first bowel movement between the two groups (28.4 hrs for the intervention group vs. 43.9 hrs for the control group) [23]. Teoh *et al.* reported the time of first bowel movement to be 44.4 ± 18.7 hrs in the group with early oral intake and 65.6 ± 25.4 hrs in the control group. The time to hospital discharge was 68 hrs for the intervention group and 69.4 hrs for the control group [24].

CONCLUSION

The findings of this study show that the mean time of first bowel movement, first peristaltic sounds, and time to hospital discharge were significantly different from the results of all previous studies. None of the patients developed complications during the study; bloating was reported by 4 and 2 patients in the intervention and control groups respectively. Further study is recommended using higher doses of *Carum carvi* and increased intervals between the syrup consumption times. It appears that the use of *Carum carvi* according to the principles of Iranian traditional medicine is effective to promote bowel function after Caesarean section.

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