

Effectiveness of acupuncture in postoperative ileus: a systematic review and Meta-analysis

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Abstract

OBJECTIVE: To conduct a systematic review and Meta-analysis of the effectiveness of acupuncture and common acupoint selection for postoperative ileus (POI).

METHODS: Randomized controlled trials (RCTs) comparing acupuncture and non-acupuncture treatment were identified from the databases PubMed, Cochrane, EBSCO (Academic Source Premier and MEDLINE), Ovid (including Evidence-Based Medicine Reviews), China National Knowledge Infrastructure, and Wanfang Data. The data from eligible studies were extracted and a Meta-analysis performed using a fixed-effects model. Results were expressed as relative risk (RR) for dichotomous data, and 95% CI (confidence intervals) were calculated. Each trial was evaluated using the CONSORT (Consolidated Standards of Reporting Trials) and STRICTA (STandards for Reporting Interventions in Controlled Trials of Acupuncture) guide-

lines. The quality of the study was assessed using the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach.

RESULTS: Of the 69 studies screened, eight RCTs were included for review. Among these, four RCTs (with a total of 123 patients in the intervention groups and 124 patients in the control groups) met the criteria for Meta-analysis. The Meta-analysis results indicated that acupuncture combined with usual care showed a significantly higher total effective rate than the control condition (usual care) (RR 1.09, 95% CI 1.01, 1.18; $P = 0.02$). Zusanli (ST 36) and Shangjuxu (ST 37) were the most common acupoints selected. However, the quality of the studies was generally low, as they did not emphasize the use of blinding.

CONCLUSION: The results suggested that acupuncture might be effective in improving POI; however, a definite conclusion could not be drawn because of the low quality of trials. Further large-scale, high-quality randomized clinical trials are needed to validate these findings and to develop a standardized method of treatment. We hope that the present results will lead to improved research, resulting in better patient care worldwide.

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Key words: Gastrointestinal diseases; Postoperative complications; Ileus; Acupuncture; Point ST 36 (Zusanli); Point ST 37 (Shangjuxu); Review; Meta-analysis

INTRODUCTION

Postoperative ileus (POI), also known as postoperative

functional gastrointestinal disorder or enteroplegia, is a frequent condition after surgery. Ileus is the absence of intestinal peristalsis without mechanical obstruction.¹ POI refers to the time post-surgery before coordinated electromotor bowel function resumes.¹ It is generally defined as transient inhibition of normal gastrointestinal motility and typically lasts 3-5 days post-surgery.² POI can selectively affect the stomach, small intestine, or colon; each type is characterized by different mechanisms and clinical presentations and is managed differently.¹

The small bowel normally resumes activity several hours post-surgery, the stomach 24-48 h post-surgery, and the colon 3-5 days post-surgery.¹ After abdominal surgery, multiple reasons may cause functional gastrointestinal disorders, which disturb the recovery of the patients and it usually takes 2-4 days to heal.³ POI that persists longer than this can be considered pathologic and is sometimes called paralytic ileus.¹

The clinical consequences of POI include worsened postoperative pain, nausea, vomiting, delay in resuming enteral nutrition, and prolonged hospitalization. Other postoperative complications include deconditioning, malnutrition, increased risk of nosocomial infections, and pulmonary complications.² Prolonged hospital stays increase the risk of hospital-acquired infections, deep vein thrombosis, and other conditions.¹ The mean length of hospital stay for patients with POI is 9.3 days; for patients without POI is 5.3 days.¹ The economic burden of the disorder is considerable.¹

Neural and chemical factors may cause POI. Important risk factors are a sympathetic-parasympathetic imbalance, chemical mediators (e.g., nitric oxide), vasoactive intestinal peptide, substance P, calcitonin gene-related peptide, endogenous opioids, inflammation, and narcotic analgesics.¹ Opiates delay colonic transit in postoperative patients.¹ Nonsteroidal anti-inflammatory drugs such as ketorolac (Toradol) possess anti-inflammatory and opiate-sparing properties, but can cause bleeding, renal insufficiency, and gastritis.¹

Strategies for POI prevention and management include surgical techniques, supportive care, patient-initiated activities, and pharmacologic interventions.¹ Epidural anesthesia shortens ileus and reduces the need for narcotics.¹ Thoracic epidural analgesia effectively blocks sympathetic pathways, hastens the return of bowel function by 1-2 days, and reduces the need for opiates compared with systemic opioids alone.¹

Laparoscopic surgery is less traumatic than open surgery and results in a less vigorous systemic inflammatory response, as measured by interleukin-1, -6, and C-reactive protein circulating levels.¹ The length of stay and the duration of POI are also shorter.¹ Prokinetic agents have been evaluated with mainly disappointing results.² Metoclopramide failed to improve postoperative bowel motility in several randomized trials.² Cisapride showed promise in some prospective trials but was withdrawn from the US market because of cardiovascu-

lar side effects.² Erythromycin was ineffective in shortening POI in two prospective trials.² Domperidone has not been evaluated in a postoperative setting and is not currently available in the United States of America.² Laxatives are a potential agent in the management of POI but larger, randomized trials need to be performed before their routine use in postoperative care.² A recent small study showed that cyclooxygenase (COX)-2-selective inhibitors are effective in reducing ileus and may decrease the risk of bleeding associated with nonselective COX inhibitors.² However, a standardized treatment with minimal side effects still awaits further trials.²

Acupuncture is widely accepted in China as well as throughout the world as an effective treatment option for the management of postoperative nausea and vomiting, and various functional gastrointestinal disorders.⁴⁻⁶ However, its role in treating POI is less clear and data from the Chinese and Western literature are scarce.⁴ Acupoint injection, auricular acupressure, abdominal acupuncture, electroacupuncture, and catgut embedment have been used to treat gastrointestinal disorders.⁷ Common acupoints selected include single acupoints of Zusanli (ST 36) and Tianshu (ST 25); the lower confluent acupoints of bilateral Zusanli (ST 36), Shangjuxu (ST 37), Xiajuxu (ST 39), and Yanglingquan (GB 34); the distant acupoints of bilateral Hegu (LI 4), Zusanli (ST 36), Shangjuxu (ST 37), Xiajuxu (ST 39); and combinations of near and distant acupoints, such as Zhongwan (CV 12), Tianshu (ST 25), Guanyuan (CV 4), Qihai (CV 6), Zhigou (TE 6), Zusanli (ST 36), and Shangjuxu (ST 37) and such as Zhongwan (CV 12), Tianshu (ST 25), Zusanli (ST 36), Yinlingquan (SP 9) and Pishu (BL 20). Other methodologies used for these problems are warm needle therapy, acupuncture combined with oral Chinese herbs, and acupuncture combined with topical Chinese medicine.⁷

In view of the potential value of acupuncture treatment for POI, this study was carried out to evaluate its efficacy and to examine common acupoint(s) selection, manipulation techniques, side effects, and its effects on the use of rescue anti-emetics.

MATERIALS AND METHODS

The study registration number was PROSPERO CRD42013005485.

Database search strategy

The following search terms for Chinese and English articles were used:

1# To locate articles on POI: "postoperative" OR "ileus" OR "functional gastrointestinal disorder" OR "gastrointestinal dysfunction" OR "gastrointestinal disorder" OR "gastrointestinal motility" OR "gastrointestinal function" OR "enteroplegia" OR "enteroparalysis" OR "intestinal paralysis" OR "paralytic ileus"

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