Potential Benefits of Acupuncture for Enhanced Recovery in Gynaecological Surgery

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Keywords

Acupuncture · Enhanced recovery after surgery · Gynaecological surgery · Post-operative symptoms

Summary

We aimed to evaluate if acupuncture can improve clinical benefits and patient satisfaction after gynaecological surgery supported by enhanced recovery after surgery (ERAS) programmes. Therefore, we evaluated patient as well as clinical outcome in patient recovery after surgery. We searched MEDLINE, PubMed and EMBASE for articles dealing with post-operative acupuncture and extracted 9 suitable studies. We expected acupuncture to alleviate surgical stress, reduce emetic symptom and accelerate recovery from complications in pre-, intra-, and post-operative phases. Gastrointestinal motility and coldness achieved the full improvement rate of 50%. With regard to post-operative nausea and vomiting, 3 studies showed more than 30% and 1 showed 16% improvement. Sore throat and urinary retention achieved a mild improvement rate of 16% and 12%, respectively. In this study, we demonstrated that acupuncture can enhance recovery in gynaecological surgery without adverse effects and thus should be considered in ERAS.

Schlüsselwörter

Akupunktur · Gesteigerte Erholung nach Operation · Gynäkologische Operation · Postoperative Symptome

Zusammenfassung

Ziel der Übersichtsarbeit war es zu überprüfen, ob Akupunktur den klinischen Nutzen und die Patientenzufriedenheit nach gynäkologischen Operationen steigern kann. Hierzu haben wir Studien mit Programmen zur gesteigerten Erholung nach der Operation (ERAS) herangezogen und den klinischen Nutzen als auch die Patientenzufriedenheit ausgewertet. Dabei haben wir die Datenbanken MEDLINE, PubMed und EMBASE durchsucht und 9 Arbeiten zur Anwendung von Akupunktur in der postoperativen Phase identifiziert. Die Ergebniserwartung umfasste eine Linderung des operativen Stresses, Reduktion des Erbrechens sowie Beschleunigung der Erholung von Komplikationen während der prä- intra- und postoperativen Phase. Die gastrointestinale Motilität und Kälteempfinden besserten sich um den maximalen Wert von 50%. In Bezug auf die postoperative Übelkeit und Erbrechen zeigte sich in 3 Studien eine Besserung von über 30%; eine Studie berichtete eine 16%ige Verbesserung mit Akupunktur. Halsschmerzen und Harnretention verbesserten sich geringfügig mit 16 bzw. 12%. Aus unserer Untersuchung kann daher geschlossen werden, dass Akupunktur Wirksamkeitspotenzial für eine verbesserte Erholung nach einer gynäkologischen Operation aufweist und gerade aufgrund der nebenwirkungsfreien Qualität in ERAS berücksichtigt werden sollte.

Introduction

Although operations are commonly performed to treat disease, they often result in uncomfortable conditions that are related to surgical stress. To overcome this situation and provide better outcomes, physicians try to perform efficient management programmes. Among these programmes, enhanced recovery after surgery (ERAS), also referred to as the fast-track surgery programme, is a multidisciplinary approach to reduce hospital stays, provide early discharge with fewer complications, increase quality of life and fulfill subjective satisfaction. The team members, including surgeons, nurses, anaesthesiologists, pain specialists, and physical therapy staff, all play a role in the success of the programme [1]. The programme also helps to standardise operation procedures and to evaluate their validity.

Yet, there are some weak points in ERAS, especially regarding gynaecological surgery. Physicians point out, that e.g. women exhibit higher anxiety levels in a different way before surgery. As a consequence, the doctors prescribe different preanaesthetic medication regimens in men and women. Accordingly, postoperative nausea and vomiting (PONV) occurs more frequently in women than in men. In gynaecological pelvic surgery, for example, care must be taken to preserve gastrointestinal (GI) and ureterovesical function, as a feeling of femininity loss might occur in women undergoing hysterectomy. To reduce these adverse effects after surgery, acupuncture might provide an effective approach.

Acupuncture involves the stimulation of specific acupuncture points (acupoints) on the skin of the body by needle insertion, acupressure, moxibustion and cupping. Stimulating specific acupoints can harmonise imbalances in the flow of qi through channels known as meridians. The effects of acupuncture on pain control, anxiety disorders [2] and PONV are well known [3].

Therefore we aimed at evaluating acupuncture as a potentially useful element in ERAS to alleviate adverse effects after gynaecological surgery. For implementation in practice, we evaluated whether acupuncture could improve the clinical outcomes regarding clinical benefits and patient-reported outcome (PRO).

Methods

Search and Appraisal

MEDLINE, PubMed and EMBASE were searched for controlled studies on acupuncture in gynaecological surgery that had been published up to March 2014. The following keywords were used as queries: acupuncture OR moxibustion OR cupping AND gynaecological surgery OR hysterectomy OR laparoscopy. The searches were limited to human clinical trials, written in English. Duplicated articles from different databases were eliminated, and the title and abstract were screened. Those articles not relevant, e.g., on cholecystectomy, were excluded. Among the identified articles, only articles on gynaecological surgery for non-malignant conditions were included. Finally, data from 9 articles were analysed (fig. 1).

ERAS Programme Organisation

We extracted the core elements of ERAS for pre-, intra-, and post-operation procedures as introduced in the selected articles. The clinical outcomes were divided into patient-reported (PRO) and clinician-reported outcome (ClinRO). Then, we listed the acupuncture interventions that are expected to produce clinically significant outcomes based on the existing general findings on acupuncture. Next, we looked at the pre-, intra- and post-operation procedures independently and allocated the respective acupuncture therapy to each procedure.

Outcome Assessment

To assess the benefits of acupuncture, we assessed the differences between means in the acupuncture and control groups in the reviewed studies and summed up PRO and ClinRO. In the case of multiple measures, the difference of the conservative values was considered. Our rating was based on the benefit ranking system indicating a symptom improvement of $\geq 30\%$ as clinically significant ('good' level), an improvement of 20–30% as 'fair' and 10–20% as 'not bad' [4].

Results

Acupuncture-extended ERAS Programme

To evaluate effectiveness of acupuncture in each phase of operation, we identified 16 main components of the gynaecological ERAS programme [5].

In the pre-operative phase, the medical staff informed the patient about the process and estimated outcome of the operation. Solid food fasting for 6 h and clear liquid fasting for 2 h prior to

Table 1. Enhanced recovery after surgery (ERAS) programme with acupuncture

Operative phase	Elements of treatment	Clinical outcomes		Applied modality
		patient-reported	clinician-reported	
Pre	information and counselling	anxiety-depression scale		acupuncture
	fasting and carbohydrate loading		first passing flatus first bowel motion resuming liquid diet first defecation	
	pre-anaesthetic medication antimicrobial prophylaxis	sleep quality index	tranquilliser consumption	acupuncture
Intra	standard anaesthetic protocol preventing post-op nausea and vomiting	symptom scale	anaesthetic consumption number of emetic episodes	acupressure acupressure
	surgical incision prevention hypothermia perioperative fluid management		minimal incision	
Post	urinary drainage		removing urinary catheter urinary catheter re-insertion	acupuncture cupping
	prevention of ileus		first passing flatus first bowel motion resuming liquid diet first defecation	acupuncture cupping
	analgesia nutrition care early mobilisation nurse led follow-up	pain intensity symptom scale	analgesic consumption	acupuncture
		quality of life patient satisfaction	walking independently complications	acupuncture moxibustion Hand acupuncture
	audit			moxibustion hand acupuncture

surgery were assumed to influence the early recovery of GI motility. Pre-anaesthetic medication for sedation and antibiotic prophylaxis for infection prevention were also considered [6]. It was found that in this phase, acupuncture enhanced the alleviation of psychological stress by improving anxiety and depression as well as the sleep quality index, thereby potentially enhancing patient compliance towards operation [7, 8].

In the intra-operative phase, a minimally invasive incision on the operative site was made, along with local anaesthesia [9]. As anaesthesia causes PONV as typical adverse reaction, acupressure was applied as potential measure to alleviate the symptoms. Indeed, in this phase, acupressure reduced the symptom level so that the patients were more comfortable.

In the post-operative phase, pain control, recovery of GI, recovery of urinary function, early oral nutrition and early mobilisation were identified as the main aims of ERAS. In general, ERAS was effective in preventing major and minor post-operative complications and provided careful follow-up [10]. In this phase, multimodal complementary and alternative therapies, such as acupuncture, acupressure, cupping, moxibustion and hand acupuncture

were actively used in the reviewed studies to accelerate recovery by reducing pain intensity and several symptom scale parameters, including time to remove urinary catheter, first passing flatus, bowel motion, liquid diet, defecation and walking independently. Thus, the application of acupuncture improved quality of life and patient satisfaction (table 1).

Benefits of Acupuncture in ERAS Programme

Firstly, we identified symptoms potentially alleviated by acupuncture, reaching from 8 h to 5 years. The identified therapeutic modalities were acupuncture, acupressure or hand acupressure.

Acupuncture was employed in PONV, pain and urinary retention using acupoints ST36, SP6, ST28 and CV8. The first 3 acupoints belong to the meridians of the gastrointestinal system; the latter acupoint involves the meridians of the reproductive system. Several auricular acupoints were identified, including shen men i.e. 'heavenly gate') effectively controlling pain and being useful in treatment of anxiety, sedation and inflammation. The CV8 acupoint, an abdominal acupoint, was also selected for adjunctive therapy with moxibustion [11–13].

Table 2. Clinical benefits of acupuncture in enhanced recovery after surgery (ERAS) programme in gynaecology

	PONV		Pain	Sore throat	GI motility	Urinary retention	Coldness
Surgical procedures							
Hysterectomy	within 1-day PO	within 1-day PO		8 h PO		15-day PO	
Laparoscopy		within 1-day PO	undergoing operation		1- to 3-day PO		within 5-year PO
Therapeutic modalities*							
Acupuncture		38% difference incidence rate;	no difference			12% reduced micturition	
		auricular points, single, twitch stimulation	auricular points (shen men)			ST36, SP6, ST28, CV8 with moxibustion	
Acupressure	16% difference; incidence rate				50% difference Stethoscope and VAS		
	P6				ST36, SP6, PC6		
Hand acupuncture	30% difference; incidence rate	>30% difference incidence rate		16% difference severity score			>50% Difference in VAS
	K-D2, P6, with capsicum; plaster	K-K9		K-A20, with capsicum; plaster			with Moxibustion
Control interventions							
	placebo tape	similar pressure on non-acupoint	no treatment	electrodes on sham point	similar pressure on sham points	acupoint injection with vitamin B	
Outcome PRO			patient satisfaction	pain intensity by VAS	patient satisfaction GI motility by VAS;		sensation of coldness and pain by VAS
ClinRO	number of emetic episode (anti-emetic effect)	effective irrespective of morphine consumption	number of emetic episode (anti-emetic efficacy)	opioid analgesia consumption	food intake; GI motility by stethoscope	number of treatment; urinary residual volume	DITI examination
Benefit ranks							
>30% good	30%	38%			50%		50%
>20% fair							
>10% not bad							
<10% no difference	16%		0%	16%		12%	
PONV = post-operative nausea and vomiting; GI = gastrointestinal; PO = post operation; VAS = visual analogue scale; PRO = patient-reported outcome; ClinRO = clinician-reported outcome; DITI = digital infrared thermographic imaging. *Point, concomitant modality.							

Acupressure was adopted to relieve PONV and to accelerate GI motility. Acupressure point selection was similar to acupoint selection, i.e. P6, ST36 and SP6 [14, 15].

Hand acupuncture was utilised for PONV, sore throat and coldness, the latter being tentatively defined as a chilled state due to uneven circulation of qi and blood according to yin and yang theory. The selected points were the newly defined points, K-D2, K-K9 and K-A20 including the standardised point P6. Hand acupuncture was performed along with e.g. capsicum plaster or moxibustion [16–19]. Control interventions involved placebo tape, similar pressure on non-acupoint, no treatment, electrodes on sham point, or acupoint injection with vitamin B. We reviewed the results of 3 studies on acupuncture for PONV as ‘good’, indicating 30% symptom relief. The GI motility and studies on coldness also showed ‘good’ results. The improvements in sore throat, urinary retention and PONV in 1 study were ranked as ‘not bad’. Interestingly, there was no difference in pain.

The PROs of the PONV studies showed a higher degree of patient satisfaction after acupuncture, and ClinRO assessment showed a reduced number of emetic episodes (anti-emetic effect). For symptoms of GI motility, the acupressure-treated patients showed improvement (PRO) based on self-reporting questionnaires including visual analogue scale (VAS). The ClinRO was assessed by stethoscope. The PRO for urinary retention suggested that acupressure shortened the course of treatment, and the ClinRO suggested that acupressure decreased the urinary residual volume.

Hand acupuncture treatment for coldness showed pain relief, as indicated by the patients, and increased the internal body temperature, as indicated by the clinicians using DITI examination (table 2).

Discussion

In this study, we introduced the ERAS programme involving acupuncture for pre-, intra-, and post-operative gynaecological surgery. As shown in this review, acupuncture alleviates surgical stress, reduces the emetic symptom and accelerates recovery from complications in pre-, intra-, and post-operative phases, respectively. For the implementation in practice, acupuncture was found to play a beneficial role by improving PRO, such as treatment satisfaction, VAS and sensation of coldness. These findings support the usefulness of acupuncture to alleviate symptoms of post-operative conditions, such as PONV, urinary retention and coldness as well as to enhance GI mobility after surgery.

To evaluate benefits of acupuncture in gynaecological surgery, we focussed on the ERAS programme as a standard clinical pathway to achieve early recovery for patients undergoing major surgery. We believe that acupuncture can improve the potential, range and effectiveness of this programme since its framework is not self-contained, last but not least in order to achieve improvements in patient-centred medicine [20].

Enhancement of recovery can be measured in 2 domains: PRO and ClinRO. PRO reports the status of a patient’s condition that is directly provided by the patient (PRO) beyond a professional inter-

pretation (ClinRO) [21]. An important outcome in both domains is the number of in-patient days as discharge criteria relate to reduced symptom levels, programme compliance, satisfaction of patients and other factors [22]. Both PRO and ClinRO are important for determining the discharge and nurse-led follow-up. PRO could serve as a key factor to update this ERAS programme facilitating patient-centred and personalised medicine.

There is evidence suggesting that acupuncture only alleviates post-operative symptoms [23]. Unfortunately, acupuncture in ERAS alone provides no additional significant measure except for its value as a CAM modality. However, superiority of integrative medical care had already been proven in various studies [24, 25]. In this study, no values were identified for pain, which could be assessed according to consumption of analgesic agents or a patient-reported VAS scale during hospitalisation [28]. Opioid analgesics have a strong effect on acute pain control; thus, the effect of acupuncture is potentially masked during hospitalisation. However, acupuncture may be able to significantly alleviate the chronic pelvic pain that is often observed after hysterectomy [29].

In the pre-operative phase, acupuncture can relieve surgical stress and increase compliance for the success of the operation given that it ameliorates anxiety, emotional stress and depression [26]; it also can decrease adverse reactions to anaesthetic agents [27]. During the post-operative phase, acupuncture can successfully manage complications by increasing GI motility, preventing urinary retention, and alleviating PONV within 1 month after surgery. Moreover, acupuncture offers good supportive care in the treatment of post-operative fatigue, chronic pain, coldness and mood disorders, thereby resulting in improved health-related quality of life. Yet, it is difficult to measure the direct and sole effect of acupuncture as it is often masked by analgesic agents [28] having strong effects on acute pain control. However, acupuncture may be able to significantly alleviate chronic pelvic pain that is often observed e.g. after hysterectomy [29]. In South Korea it is quite common that adult hysterectomy patients who suffer from decreased physical and weakened emotional functions tend to visit traditional Korean medical clinics to receive acupuncture, moxibustion, herbal therapies or hand acupuncture for enhanced recovery. This local situation would provide the feasible model for ERAS with acupuncture giving a basis for implementation in practice. However, the introduced model needs to be tested in controlled clinical trials [30].

Due to difficulties in summarising the control interventions and the limited number of reviewed studies, no statistically clear conclusion of acupuncture efficacy can be drawn in this context. However, according to positive PRO and ClinRO for acupuncture in gynaecological surgery, this CAM method has beneficial potential to enhance ERAS and to help alleviating symptoms after surgery.

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Disclosure Statement

The authors declare that there is no conflict of interests concerning this paper.

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