Korean Hand Acupressure Reduces Postoperative Nausea and Vomiting After Gynecological Laparoscopic Surgery

Michael Boehler, MD, Gottfried Mitterschiffthaler, MD, and Andreas Schlager, MD

University Department of Anesthesiology and Critical Care Medicine, University of Innsbruck, Innsbruck, Austria

To investigate the effectiveness of prophylactic Korean hand acupressure in the prevention of postoperative vomiting in women scheduled for minor gynecological laparoscopic surgery, we conducted a double-blinded, randomized, placebo-controlled study. In one group (n = 40), acupressure was performed 30 min before the induction of anesthesia by using special acupressure seeds, which were fixed onto the Korean hand acupuncture point K-K9 and remained there for at least 24 h. The second group (n = 40) functioned as the Placebo group. The treatment groups did not differ with regard to demographics, surgical procedure, or anesthetic administered. In the Acupressure group, the incidence of nausea and vomiting was significantly less (40% and 22.5%) than in the Placebo group (70% and 50%). We conclude that Korean hand acupressure of the acupuncture point K-K9 is an effective method for reducing postoperative nausea and vomiting in women after minor gynecological laparoscopic surgery.

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Postoperative nausea and vomiting (PONV) are still common problems after surgery under general anesthesia. In the absence of prophylactic antiemetics, gynecological patients undergoing laparoscopic surgery show a frequent incidence of PONV (40% to 77%) (1). Several pharmacological and nonpharmacological studies have been performed with the aim of preventing PONV. Acupuncture and acupressure are well investigated nonpharmacological methods for reducing the incidence of PONV. Several studies have shown acupuncture and acupressure of the Chinese acupuncture point Pericard 6 (P6; nei guan) to be an effective nonpharmacological antiemetic therapy (2–7).

In contrast to Chinese acupuncture, Korean hand acupuncture is a new method that was first developed and described by the Korean physician T-W Yoo (8). However, a very limited number of studies on the efficacy of Korean hand acupuncture are available. Only one study examining the antiemetic effect of Korean hand acupuncture in children after strabismus surgery has been published thus far (9). The Korean hand acupuncture point K-K9 is located on the middle phalanx of the fourth finger on both hands. It corresponds to the Chinese acupuncture point P6, whose antiemetic effect has been ascertained in numerous studies (2–7).

We therefore assumed that stimulation of K-K9 produces an antiemetic effect similar to that of P6. We investigated the antiemetic effect of prophylactic acupressure on the Korean hand acupuncture point K-K9 in women undergoing gynecological laparoscopic surgery.

Methods

The study was approved by the Ethics Committee of the University of Innsbruck, Austria. Written, informed consent was obtained from all patients. Eighty women, ASA physical status I or II, aged between 18 and 60 yr, who were scheduled for minor gynecological laparoscopic surgery were randomly assigned to one of two groups on the basis of a computer-generated random numbers table. Only patients in the premenstrual phase of the menstrual cycle were included in the study. Patients with gastric or intestinal disease or with nausea or vomiting in the previous week and patients receiving any medical therapy immediately before surgery were excluded. In Group A, acupressure was performed on both hands on the Korean hand acupuncture point K-K9, which is located on the middle phalanx of the fourth finger (9). We used a special acupressure seed (2-mm diameter), which was fixed on K-K9 with opaque adhesive tape. Acupressure was administered to K-K9 on both hands 30 min before the induction of anesthesia and was

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Address correspondence and reprint requests to Andreas Schlager, MD, Department of Anesthesiology and Critical Care Medicine, Anichstraβe 35, A-6020 Innsbruck, Austria. Address e-mail to andreas.schlager@uibk.ac.at.

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maintained for at least 24 h. In Group B, the Placebo group, the acupressure seeds were fixed on the ulnar sides of both fifth fingers, namely on points not defined in Korean hand acupuncture. For adequate blinding, an opaque tape was applied to the fourth and the fifth finger of each hand of the patient. In the Verum group, we put a tape with an acupressure seed on point K-K9 on the fourth finger and a tape without a seed on the fifth finger. In the Control group, we performed this procedure *vice versa*. Both acupressure and placebo treatment were performed by the same investigator.

The patients, the anesthesiologist, and the nursing staff were unaware of the group assignments. All patients were allowed solid food or clear fluids up to 6 h before anesthesia. Nothing-by-mouth fasting was continued postoperatively for 24 h after the laparoscopic procedure.

Oral premedication with diazepam 0.15 mg/kg was given 1 h before the expected start of anesthesia. Laparoscopic surgery was performed under general anesthesia. Thiopental 5 mg/kg, rocuronium bromide 0.6 mg/kg, and fentanyl 2 μg/kg were administered IV to induce anesthesia. After intubation, anesthesia was maintained with sevoflurane (1–2 vol%), nitrous oxide (66.6%), and oxygen (33.3%) under controlled ventilation. Both groups received a standard regimen of fluid replacement (15 mL/kg lactated Ringer's solution) for the first 15–20 min. Subsequently, the regimen was reduced to 10 $mL \cdot kg^{-1} \cdot h^{-1}$.

Residual neuromuscular block was antagonized with neostigmine 0.05 mg/kg and atropine 0.025 mg/kg. At the end of anesthesia, all patients were transferred to the recovery room, and when they were fully awake with stable vital conditions, they were transferred to the gynecological ward. For postoperative analgesia the patients received diclofenac 75 mg IV and piritramide 0.1 to 0.15 mg/kg IV. If vomiting occurred more than twice, tropisetron 2 to 5 mg IV was administered as rescue antiemetic medication. The incidence of nausea and vomiting was recorded by the nursing staff in the postanesthesia care unit and on the general ward. Documentation covered 24 h after the start of anesthesia. After surgery, all patients remained in the hospital for at least 24 h.

The number of patients required was determined by power analysis with a power of 0.9 (α risk at 0.05). We assumed the incidence of vomiting to be 65% in the Control group and 25% in the Acupressure group. Statistical analysis was performed with SPSS 8.0 (SPSS Inc., Chicago, IL). The χ^2 test was used to determine the incidence of vomiting and the unpaired Student's *t*-test to analyze demographic data. A *P* value of <0.05 was considered statistically significant.

Table 1. Patient Characteristics Expressed as Means (SD) or *n* (%)

Variable	Acupressure ($n = 40$)	Placebo ($n = 40$)
Age (yr)	35.4 (9.6)	38.0 (10.9)
BMI	22.3 (2.9)	23.1 (3.1)
History of prior PONV	5 (12,5%)	4 (10%)
Smokers	14 (35%)	17 (42%)
Body weight (kg)	60.9 (10.1)	63.9 (10.3)
Surgery duration (min)	47.1 (13.5)	51.1 (16.7)
Diagnostic laparoscopy/ laparoscopic operative procedure	25/15	23/17
Fentanyl (mg)	0.24 (0.07)	0.22 (0.05)
Piritramide (mg)	8.25 (2.25)	8.8 (1.6)

BMI = body mass index; PONV = postoperative nausea and vomiting.

Table 2. Incidence of Postoperative Vomiting

Variable	Nausea	Vomiting
Acupressure group ($n = 40$)	16 (40%)	9 (22.5%)
Placebo group ($n = 40$)	28 (70%)	20 (50%)
P value	0.006	0.007

Values expressed as *n* (%).

Results

As shown in Table 1, the two groups did not differ statistically with regard to age, ASA physical status, body mass index, history of prior PONV or smoking, duration of surgery, operative procedure, or opioids given intra- and postoperatively. The incidence of nausea was significantly less in the Acupressure group ($P = 0.006$) than in the Placebo group. In the first 24 h after surgery, nausea occurred in 16 patients (40%; 95% confidence interval [CI], 24.7%–56.7%) in the Acupressure group and in 28 patients (70%; 95% CI, 53.5%–83.4%) in the Placebo group (Table 2).

In the Acupressure group, the incidence of vomiting was significantly less ($P = 0.007$) than in the Placebo group. In the first 24 h after surgery, vomiting occurred in 9 patients (22.5%; 95% CI, 10.8%–38.5%) in the Acupressure group and in 20 patients (50%; 95% CI, 33.8%–66.2%) in the Placebo group (Table 2).

The frequency of nausea and vomiting within the first 24 h after surgery is shown in Table 3. No patient complained of nausea or vomited after 8 h after the laparoscopic procedure. Eight women receiving acupressure and 15 women in the Placebo group required tropisetron as antiemetic rescue therapy.

Discussion

Several investigations have shown that stimulation of the Chinese acupuncture point P6 is as effective as antiemetic prophylaxis (3–7,10–12). In a metaanalysis,

Table 3. Appearance of First Nausea or Vomiting After Surgery was Completed

Variable	0–2 h (PACU)	3–8 h	8–16 h	16–24 h	0–24 h
Nausea					
Acupressure (n = 40)	14 (35%)	2 (5%)	0	0	16 (40%)
Placebo (n = 40)	22 (30%)	6 (12.5%)	0	0	28 (70%)
Vomiting					
Acupressure (n = 40)	7 (17.5%)	2 (5%)	0	0	9 (22.5%)
Placebo (n = 40)	15 (37.5%)	5 (12.5%)	0	0	20 (50%)

Data are presented as n (%).
PACU = postanesthesia care unit.

Lee and Done (13) reported the antiemetic effect of acupuncture or acupressure of P6 to be comparable to that of antiemetics such as metoclopramide, cyclizine, droperidol, or prochlorperazine.

In contrast to Chinese acupuncture, Korean hand acupuncture is still rarely applied in Western medicine. A very limited number of studies on the efficacy of Korean hand acupuncture are available. In international literature, only one study examining the antiemetic effect of Korean hand acupuncture has been published (9). The authors of that study were able to demonstrate the antiemetic effect of acupressure of the Korean hand acupuncture point K-K9 in children undergoing strabismus surgery.

The results of this study demonstrate for the first time the antiemetic effect of prophylactic acupressure of the Korean hand acupuncture point K-K9 in adult patients after gynecological laparoscopic surgery. The incidence of nausea was significantly reduced from 70% in the Placebo group to 40% in the Acupressure group, and the incidence of vomiting was significantly reduced from 50% to 22.5%.

Our results are in agreement with those of previous studies on the antiemetic effect of the Chinese acupuncture point P6 and the pharmacological prevention of PONV in patients undergoing gynecological laparoscopic surgery. In these patients, al-Sadi et al. (3) were able to reduce vomiting from 65% to 35% in the hospital and from 69% to 31% after discharge from the hospital, as compared with a Placebo group. Similarly, acupressure of P6 has been shown to reduce PONV after gynecological laparoscopic surgery [Harmon et al. (7), from 42% to 19%; Gieron et al. (6), from 53% to 23%]. The work of Alkaissi et al. (2) is of great interest because they found that placebo acupressure of P6 is able to reduce nausea but not postoperative vomiting. However, Allen et al. (14) additionally found that acupressure of P6 reduces rescue medication, but not PONV.

To produce a sufficient antiemetic effect by means of acupuncture or acupressure, the acupuncture point should be stimulated before the induction of anesthesia (15). However, needle acupuncture of P6 is uncomfortable in awake patients and therefore is often performed after the induction of general anesthesia. For this reason, acupressure is often the method of choice for the prevention of PONV. Acupressure is easy to perform, painless, and well tolerated by patients. Several authors have investigated the antiemetic effect of acupressure by using so-called sea bands on the acupuncture point P6 (5–7).

Dundee and McMillan (4) found that stimulation of P6 must be strong to be sufficiently effective in preventing PONV. To provide a powerful stimulus to K-K9, we used special acupressure seeds instead of the acupressure discs (AB-Bongs) usually used in Korean hand acupuncture. Because the seeds had a diameter of 2 mm, we were able to fix them to K-K9 in such a way that more pressure was exerted than with AB-Bongs.

The antiemetic effect produced by acupressure of K-K9 in patients after laparoscopic gynecological surgery seems just as sufficient as pharmacological antiemetic prophylaxis (16–23). Therefore, prophylactic acupressure of K-K9 is an excellent procedure for reducing PONV and may be an alternative to a pharmacological approach.

In conclusion, prophylactic stimulation of the Korean hand acupuncture point K-K9 is effective in reducing the incidence of PONV in patients undergoing minor gynecological laparoscopic surgery. Korean hand acupuncture has scarcely been investigated thus far, but its effectiveness was demonstrated once again in this study. Prophylactic acupressure of K-K9 is an excellent and adequate method for reducing PONV and should be used in patients undergoing procedures with an increased risk of PONV.

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