

## Effects of acupressure on nausea and vomiting after gynecological laparoscopy surgery for infertility investigations

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**Abstract: Background:** Laparoscopic gynecological procedures have nearly an 80% incidence of Postoperative nausea and vomiting. Acupressure is a non-invasive and non-pharmacological method of preventing nausea and vomiting. In this study we used of Korean hand acupressure method for treatment of postoperative nausea and vomiting. **Materials and Methods:** One hundred and twenty patients were randomized into three groups of 40 female for laparoscopic gynecological procedures base on type of interventions prior operation: Group I (control), Group II (acupressure) and Group III (metoclopramide). **Results:** The incidence of nausea within 24 hours after operations were 45%, 27.5% and 30% in control, acupressure and metoclopramide groups respectively which were significant between three groups with minimum incidence in acupressure group ( $p=0.005$ ). **Conclusion:** Acupressure is a non-pharmacological method for PONV with no side effects and cost benefit advantages.

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### 1-Introduction:

One of the important problems after anesthesia and surgery is postoperative nausea and vomiting (PONV) [1,2]. It is frequent in patients undergoing general anesthesia and is a distressing experience for patients.

The serious complications may ensue, including tension on suture line, increased blood pressure and bleeding under skin flaps affecting quality of surgical outcome. The patients are at increased risk of pulmonary aspiration of vomitus as the airway reflexes are depressed postoperatively. PONV occurs in approximately 30% of all patients undergoing general anesthesia (3,4). The incidence of PONV is influenced by various patient related factors, type of surgery, anesthesia technique and postoperative factors such as pain, use of opioids for pain relief, dizziness and ambulation (5,6). The type of surgery is an important influence factor for PONV (7,8). Interestingly,

laparoscopic gynecological procedures have nearly an 80% incidence of PONV (9). Although the exact reasoning is unknown it has been suggested that in addition to the female gender risk factor that the increased intra-abdominal pressure used during laparoscopic procedures may be partly responsible for this dramatic increase in PONV (10).

Different kind of pharmacological and non-pharmacological management has been proposed for postoperative nausea and vomiting. Various pharmacological means are available to alleviate PONV, but may cause many side effects such as lethargy, restlessness, tachycardia, extrapyramidal effects, cardiac arrhythmias and dystonic reactions (11, 12, 13). Acupressure is a non-invasive type of acupuncture that has reported as a potential non-pharmacological method of preventing nausea and vomiting. In acupressure, manual stimulation is applied, unlike acupuncture where the skin is pierced with a needle. Studies have shown

that acupressure can decrease nausea caused by morning sickness (14), general anesthesia (15) and chemotherapy (16). But other studies of this technique have had unfavorable results (17, 18).

In contrast to Chinese acupuncture, Korean hand acupuncture is a new method that was first developed and described with the Korean physician T-W Yoo (19). However, a very limited number of studies on the efficacy of Korean hand acupuncture are available. The Korean hand acupuncture point K-K9 is located on the middle phalanx of the fourth finger on both hands. In this study we used of Korean hand acupressure instead of acupuncture for prevention of PONV as a non-pharmacological and noninvasive method for treatment of PONV.

## 2-Materials and Methods:

After obtaining approval from the institutional ethics committee of our university, and written informed consent, we conducted a prospective, randomized and double-blind study.

We studied ASA I-II female patients in the fertile ages, undergoing laparoscopy for infertility investigations and treatment in our hospital. Criteria for exclusion included obesity (BMI >35), prolong and severe manipulations during surgery, diabetes mellitus and a previous history of PONV. Patients with diabetes mellitus are predisposed to peripheral vascular disease and we therefore excluded because of the risk of blood flow impairment to the digits (site for placement of acupressure band). One hundred and twenty patients were randomized into three groups of 40 each using a table of random numbers: Group I (control), Group II (acupressure) and Group III (metoclopramide).

In the group II acupressure band (special acupressure seed with 2-mm diameter), and in the other two groups (I, III) a dummy band were placed on the middle phalanx of the fourth finger on both hands (toward palms), 15 min prior to induction of anesthesia and bands were held on the fingers for 24 hours. Group III patients received metoclopramide 10 mg I.V. just before induction. The patients in groups I, II received normal saline 1 mL I.V. just before induction of anesthesia to maintain blinding.

General anesthesia for all patients were induced with thiopental 5 mg/kg iv, atracurium 0.5 mg/kg iv, morphine 0.1 mg/kg iv, midazolam 0.01-0.02 mg/kg iv and were maintained with O<sub>2</sub> and N<sub>2</sub>O. Residual neuromuscular block were antagonized in all patients

with neostigmine 2.5 mg and atropine 1.25 mg I.V. at the end of operations. All procedures were carried out with experienced surgeons.

The patients received petidine 0.3 mg/kg for pain relief and metoclopramide 0.15 mg/kg for PONV in the recovery room as required. The patients received analgesic and antiemetic for pain and PONV in the ward as required. Patients and nurses were informed that an antiemetic should be given in the presence of intolerable nausea or vomiting. Both patients and nurses were unaware of patient group allocation. The incidence of nausea and vomiting during the first 24 h was determined. The results were scored in a manner similar to that of Allen, Kitching and Nagle (20) as none, nausea, retching/vomiting. If a patient experienced both nausea and vomiting, they were recorded as having vomiting. To examine the severity of nausea and vomiting, nausea was classified as none, mild and moderate or severe. Vomiting and retching were not distinguished and severity was classified with the number of episodes within 24 hours: none, mild (1 episode), moderate (2 episodes) or severe ( $\geq 3$  episodes).

The parametric data of the patients were compared using the student t-test for the continuous variables and the chi-square test for the categorical variables. A P-value < 0.05 was considered significant.

## 3-Results:

Patients were comparable in all three groups with regard to age, weight and duration of surgery (Fig 1, 2, 3).

The incidence of nausea within 24 hours after operations were 45%, 27.5% and 30% in control, acupressure and metoclopramide groups respectively which were significant between three groups with minimum incidence in acupressure group ( $p=0.005$ ) (table 1).

The incidence of vomiting within 24 hours after operations were 37.5%, 20% and 27.5% in control, acupressure and metoclopramide groups respectively with minimum incidence in acupressure group ( $p=0.219$ ) (table 2). The incidence of severity of vomiting at severe score ( $\geq 3$  number of episodes) was in acupressure group zero and 10.5%, 2.5% in control and metoclopramide groups respectively (table 3).

No side effects or complications were observed due to the placement of acupressure finger bands.

**Table 1:** Incidence of nausea within 24 hours after operations

Groups	Numbers	Percentage
Control (n=40)	18	45%
Acupressure (n=40)	11	27.5%
Metoclopramide(n=40)	12	30%

Abbreviations: n Number P Value = 0.005

**Table 2:** The incidence of vomiting within 24 hours after operations

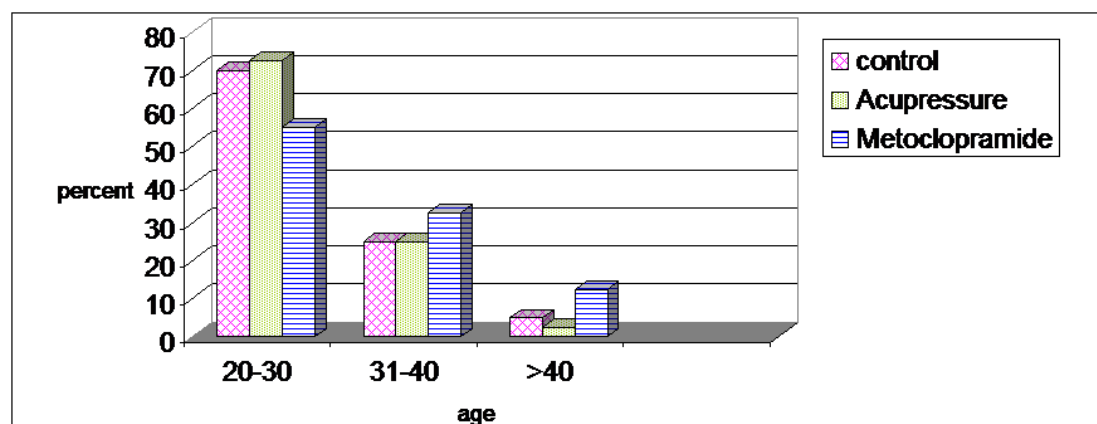
Groups	Numbers	Percentages
Control (n=40)	15	37.5%
Acupressure (n=40)	8	20%
Metoclopramide(n=40)	11	27.5%

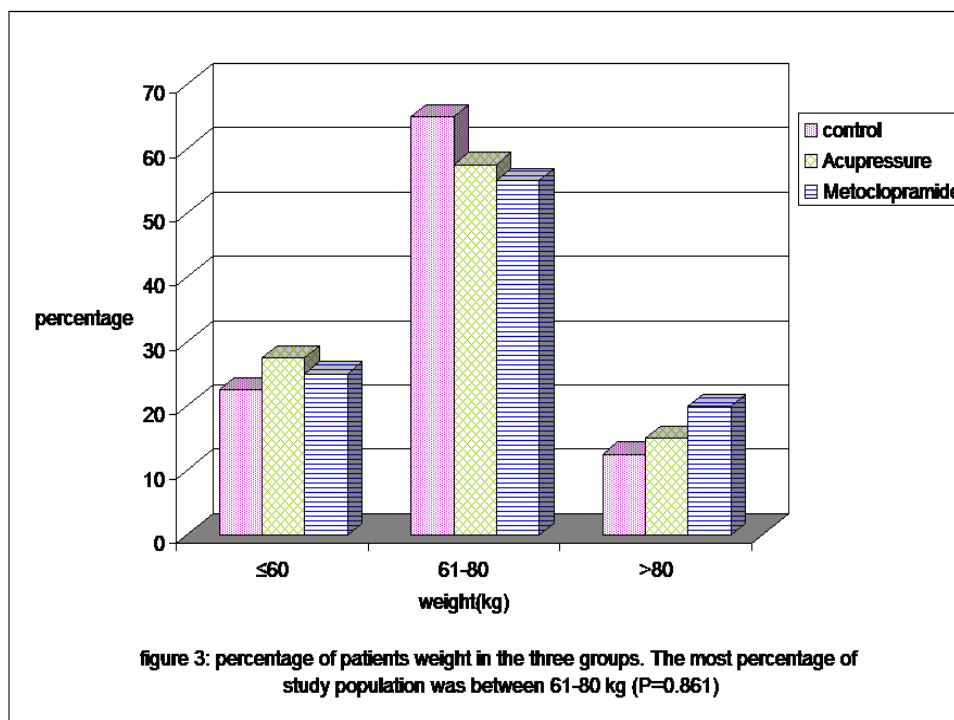
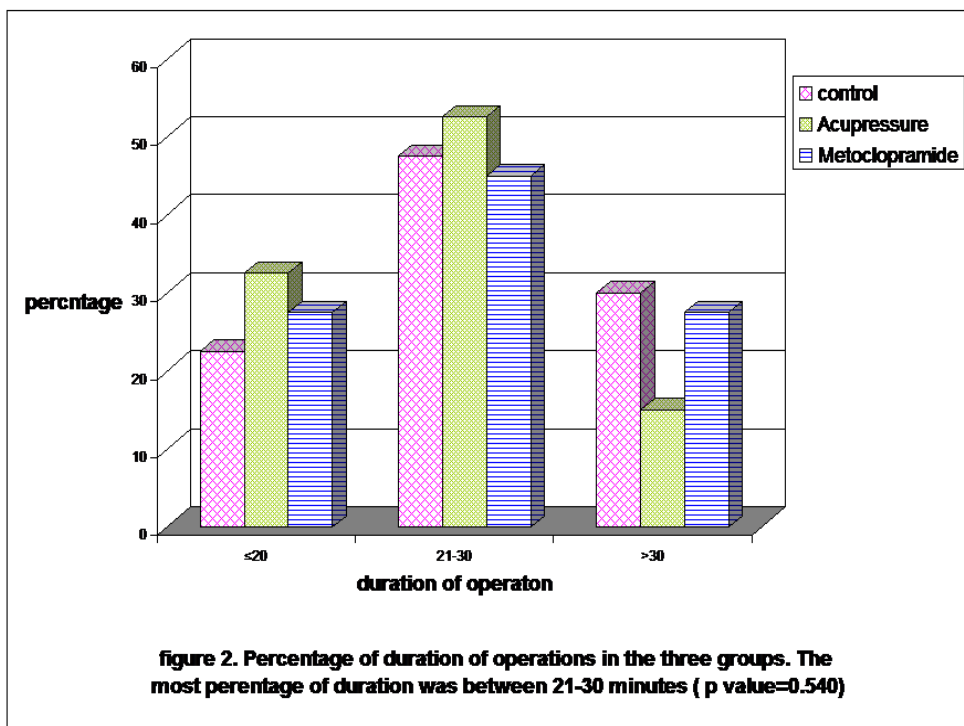
Abbreviations: n Number P Value = 0.219

**Table 3:** The incidence of severity of vomiting within 24 hours after operations

Severity	Control (n)	Acupressure (n)	Metoclopramide (n)
No	25 (62%)	32 (80%)	29 (72.5%)
Mild	6 (15%)	5 (12.5%)	9 (22.5%)
Moderate	5 (12.5%)	3 (7.5%)	1 (2.5%)
Severe	4 (10.5%)	0	1 (2.5%)

Abbreviations: n Number Outside the range of p value

**Figure 1:** Percentage of patients age in the three groups. The most percentage of study population was between 20-30 years old(P value-0.299)



**4-Discussion:**

PONV can delay recovery room discharge by 47-61 minutes (21). The time and resources required to treat PONV add to the institutional costs of the procedure. Acupressure is a non-pharmacological

method for PONV with no side effects and cost benefit advantages. The mechanism of action of acupressure is not clear. It is postulated that acupressure causes low frequency electrical stimulation of the skin sensory receptors in which may activate A β and A δ fibres.

These fibres synapse within the dorsal horn and may cause release of endorphins from the hypothalamus.

Increased levels of  $\beta$ -endorphin concentration have reported in human cerebrospinal fluid after acupuncture stimulation (22). In addition, serotonergic and norepinephrinergic fibres may activated and a possible change in serotonin levels has a role in prevention of PONV. Acupressure has shown to enhance gastric motility (23).

In our study in the acupressure group, incidence of nausea (27.5%) and vomiting (20%) within 24 hours after operations were lower than control and metoclopramide groups so acupressure significantly reduced nausea but vomiting was reduced to a lesser degree. Interestingly the incidence of severity of vomiting at severe score ( $\geq 3$  number of episodes) was in acupressure group zero.

### 5-Conclusion:

Acupressure is a non-pharmacological method for PONV with no side effects and cost benefit advantages.

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