



## Acupressure for Prevention of Postoperative Nausea And Vomiting

### KEYWORDS

postoperative nausea vomiting, acupressure

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**ABSTRACT** Post-operative nausea and vomiting (PONV) is a common complication after surgery under general anaesthesia. Several types of antiemetics are in use, but drug therapy is only partially effective in preventing PONV. There is a growing interest in the use of acupressure as a non-pharmaceutical method in preventing PONV. The aim of this double blind randomized study was to find out if acupressure could supplement the routine prophylactic treatment of PONV in our hospital.

We studied hundred female patients undergoing abdominal surgeries under general anaesthesia for incidence of PONV. The control group (n=50) received ondansetron while the acupressure group (n=50) received acupressure (wristbands) in addition to ondansetron for preventing PONV. The incidence of nausea was significantly reduced (4%) in group A as compared to 24% in group C. Only one patient in group C had vomiting. None of the patients had any side effect of acupressure bands.

Thus we conclude that acupressure wristband can be used as an adjuvant to ondansetron for preventing PONV.

### Introduction:

PONV is a common complication after surgical procedures and its incidence is as high as 60-80% in major abdominal and gynecological surgeries<sup>1</sup>. Though self limiting, it causes distress and discomfort to the patient. The mechanism behind PONV is complicated and is influenced by various patient related factors, type of surgery, anaesthesia techniques, drugs used, and post-operative factors such as pain<sup>2</sup>. Several types of antiemetics are in use, but drug therapy is only partially effective in preventing PONV. Pharmaceutical prophylaxis confers unpleasant side effects. It would therefore be appropriate to consider the use of a non-pharmacological method in preventing PONV.

Acupuncture, an old Chinese technique, is reported to be effective in preventive treatment of PONV. P6 (Nei-Guan), a Chinese meridian point, is specifically designated for the treatment of nausea and vomiting. Acupuncture at P6 is invasive and may be associated, though rarely, with side effects such as nerve damage and transmission of infectious disease. Acupressure is non-invasive and is devoid of these complications. If acupressure is found to be effective in preventing or minimizing PONV, it may reduce the patient's inconvenience, decrease hospital stay and, thus, the total cost of treatment. There have been reports suggesting that acupressure can reduce the nausea after general anaesthesia<sup>3</sup>. Acupressure wristbands are less expensive compared to most antiemetics and the adverse effects of acupoint stimulation are minimal. Considering the results from earlier studies, we were encouraged to implement acupressure into our standard anaesthetic protocol. The present study was undertaken to evaluate if acupressure was an effective supplement to the standard prophylactic treatment of PONV in female patients undergoing abdominal surgeries under general anaesthesia.

### Method:

After approval from the ethical committee, informed consent was obtained from all the patients included in the study. Hundred female patients of ASA I and II, undergo-

ing abdominal surgery under general anaesthesia lasting for less than 4 hours, were included in this double blind randomized controlled study. The patients were randomly selected into two groups using a dice, even number to control group and odd to acupressure group. Finally there were fifty patients in the acupressure group (group A) and fifty in control group (group C).

The inclusion criteria were: females between 18 to 60 years of age, ASA 1-11, surgery lasting for less than 4 hours. Exclusion criteria: refusal to participate, problems in P6 area, history of nausea and vomiting in the past 24 hours. All patients were explained, that a special band will apply pressure to their wrists to decrease their nausea and vomiting. However, they were blinded to the grouping.

Acupressure was applied by a special wristband to both the groups. This band had a button on its internal surface. In the study group, this button was placed on the Pericardium 6 (Nei-Guan) point. This treatment point is located on the anterior surface of forearm, 2 inches proximal to the distal wrist crease, between the tendon of palmaris longus and flexor carpi radialis. In the control group the button was placed on the posterior surface of the wrist. The elastic band was placed 30 minutes prior to surgery.

The bands were placed around the wrist, such that the patient felt gentle pressure without discomfort. The pressure of elastic band was adjusted neither to impair patient's radial or ulnar pulses nor to impair venous return. Standard monitors including electrocardiogram, noninvasive blood pressure and pulse oximetry were placed. Anaesthesia was standardized. All the patients were given inj ondansetron 4mg intravenously during the procedure. Anaesthesia was induced with fentanyl 2µg/kg and propofol 2mg/kg and maintained with isoflurane 1-2%, nitrous oxide and oxygen (3:2), fentanyl as required and vecuronium for neuromuscular blockade. For postoperative analgesia intravenous paracetamol 1gm was given. The patients were extubated at the end of procedure. The patients were evaluated for

nausea and vomiting immediately after shifting to the recovery and at 2, 4 and 6 hours postoperatively by a blinded observer. The bands were removed after six hours.

Nausea was graded by visual analogue scale (VAS) from 1-10 (1=none, 2-5=mild, 6-7=moderate, 8-10=severe). All the patients who had nausea and vomiting were included in the vomiting group. If the patient vomited, metoclopramide 10 mg was given intravenously.

Results were analyzed by Z test. A P value of <0.05 was considered significant.

#### Result:

In this clinical trial hundred female patients undergoing surgery under general anesthesia were randomly allocated into two groups with fifty patients in each group. The mean age was 45±7.8 years in acupressure group and 42 ± 6.1 years in the control group. The mean weight was 55 ± 10 in group C and 60 ± 11 in group A.

**Table 1: The incidence of nausea in the recovery room at 2h, 4h and 6h after the surgery among acupressure group (A) and control group (C)**

	Group	No Nausea	Mild Nausea	Moderate Nausea	Severe Nausea	Nausea (Total)
Recovery Room	A	50	0	0	0	0
	C	48	2	0	0	2
At 2 hours	A	48	2	0	0	2
	C	44	4	2	0	6
At 4 hours	A	50	0	0	0	0
	C	46	2	2	0	4
At 6 hours	A	50	0	0	0	0
	C	50	0	0	0	0
Total	A					2
	C					12*

\*Denotes P < 0.05

The incidence of nausea was 24% in the control group. The acupressure group had a significant decrease in the incidence of nausea (4%). Only one patient in the control group had vomiting and required rescue antiemetic. There were no complications due to the placement of wristband.

#### Discussion:

PONV remains a significant challenge in anaesthesia practice. Controversy continues to surround the optimal approach to preventing PONV. Although low-dose droperidol is a highly cost-effective antiemetic for routine prophylaxis, concerns exist regarding the side effects like dysphoria, restlessness and arrhythmias associated with higher doses of droperidol<sup>4</sup>. Ondansetron, a 5-hydroxy tryptamine subtype 3(5HT<sub>3</sub>) receptor antagonist is effective in preventing PONV<sup>2, 5</sup>. It is routinely used as an antiemetic in the perioperative period in our hospital. But ondansetron has been reported to be less effective in the management of nausea than vomiting (or retching)<sup>6</sup>.

Acupuncture and acupressure are based on the belief that an individual's well being depends on the balance of energy in the body as well as the overall energy level. It is hypothesized that energy flows in the body along paths referred as meridians and that these techniques restore the balance of energy by manipulating these meridians<sup>7</sup>. In traditional Chinese medical practice, the meridian P<sup>6</sup> point has been used to treat nausea and vomiting. Kotani et al concluded that acupuncture reduced the incidence of PONV after abdominal surgeries<sup>8</sup>. Chin Fu Fan claimed that stimulation by acupressure at P<sup>6</sup> point is

highly effective in reducing postoperative nausea and vomiting<sup>9</sup>. Acupressure has recently been introduced in anaesthesia practice. It has no side effects or drug interactions, is non-invasive, simple to apply, has a high degree of patient acceptance and is economical. Most studies indicate the efficacy of acupressure at P<sup>6</sup> meridian point. Fan and colleagues found this technique to be effective in surgeries associated with a high incidence of postoperative nausea and vomiting such as laparoscopic and gynecologic procedures, tonsillectomy and open cholecystectomy. We therefore studied female patients undergoing abdominal surgeries under general anesthesia.

Acupressure is inconsistent in efficacy. Agarwal et al found no significant difference with acupressure in incidence of PONV after urological procedures<sup>10</sup>. Important components of this treatment include timing of stimulation and correct point location. Acupressure, when applied after induction of anesthesia, did not report favourable results<sup>11</sup>. The possible reasons for poor results could be the wrong timing of the P<sup>6</sup> activation. The maximum levels of beta endorphin occurs twenty five minutes after P<sup>6</sup> meridian point stimulation, which in turn desensitizes the chemoreceptor trigger zone in the brain and prevents post-operative nausea and vomiting caused by inhalation anaesthetics or chemotherapeutic drugs. However once the chemoreceptor trigger zone is sensitized, it is difficult to overcome or desensitize it by the neurochemical substance<sup>12</sup>. This may explain why acupressure, in treating nausea and vomiting, must be applied before the emetic stimulus has been initiated. In our study we eliminated this possibility by applying pressure to meridian P<sup>6</sup> point half an hour before surgery.

All our patients received ondansetron. The incidence of nausea in the control group was 24%. When acupressure was supplemented to ondansetron in the group A, the incidence reduced to 2%. The enhanced overall antiemetic efficacy in the combination group may be related to the fact that acustimulation possesses relatively more anti-nausea activity than ondansetron. Only one patient in the control group had vomiting. This decreased incidence of vomiting can be attributed to the ondansetron prophylaxis received by all the patients. None of the patients had any side effects of the band.

The current study suggests that the efficacy of ondansetron can be enhanced by combining it with nonpharmacologic acustimulation therapy using the acupressure wristbands especially in the high risk group.

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