The Sigma Theta Tau International's 28th International Nursing Research Congress
27 – 31 July, 2017, Dublin - Ireland

# The Effect of Neiguan Point (p6) Acupressure with Wristband on Postoperative Nausea, Vomiting, and Comfort Level: A Randomized Controlled Study

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## Introduction

Postoperative nausea and vomiting (PONV) has a negative effect on patients. “Nausea” is present among the nursing diagnoses given by North American Nursing Diagnosis Association - International (NANDA-I), and the “effect of anesthesia” is defined as treatment-related factor of nausea nursing diagnosis. In other words, “nausea related to the effect of anesthesia” is a nursing diagnosis, which the nurse should manage with his/her independent interventions. Therefore, nurses should seek solutions to prevent nausea, raise patient comfort at the postoperative period, and test the validity and reliability of these solutions. Stimulation of the wrist acupuncture point PC6 for preventing postoperative nausea and vomiting Wrist pericardium 6 (P6) (Neiguan) acupuncture point acupressure application using a wristband is a non-pharmacological intervention, and nurses should investigate its effectiveness. Lee et al. found that there is moderate-quality evidence showing no difference between PC6 acupoint stimulation and antiemetic drugs to prevent PONV. Also they reported that further high-quality trials are needed.

## Materials & Methods

### Purpose and design of the study

The study was designed as a randomized-controlled experimental study to determine the effect of wrist P6 acupuncture point acupressure application with wristband on nausea, vomiting, and comfort level at the postoperative period. ***The following hypotheses were tested:***

First H1: Wrist P6 (Neiguan) acupuncture point acupressure application with wristband is effective as pharmacological methods in prevention of postoperative nausea.

Second H1: Wrist P6 acupuncture point acupressure application with wristband is effective as pharmacological methods in prevention of postoperative vomiting.

Third H1: Wrist P6 acupuncture point acupressure application with wristband enhances patient comfort.

**Study inclusion criteria were as follows:**

- Age between 18-65 years.
- Patient underwent gynecological operation.
- Operation was performed under general anesthesia.
- The patient had no cognitive, sensory or verbal communication issues.
- Patient volunteered to participate in the study.

**Exclusion criteria were as follows:**

- Patient underwent Caesarian section.
- Patient had cardiac pacemaker.
- Patient used anti-emetics within the last 24 hours.
- Patient had platinum or metal prosthesis at her arm which the wristband would be applied to.

### Participants

The study population consists of patients who underwent a gynecological surgery other than Caesarian section in an obstetrics hospital within the province of Bursa in Turkey. The population size was determined by reviewing the year 2011’s data, which showed that a total of 4,946 operations had been performed in the hospital that the study was conducted. A review of the literature showed that the incidence of nausea following gynecological operations varied between 58-77%. When the population size was 4,946 and incidence of nausea was as 58%, the study sample size was calculated to be 92, which was within 5% significance level and 10% error margin. Accounting for possible issues that may occur during data collection period, an additional 8 patients were added to the sample size; thus, the final sample size was determined as 100. However, in the experimental group, 2 patients received anti-emetics, and one patient was discharged earlier than planned. Therefore, 3 patients from the experimental group were excluded from the study. In the end, there were 47 patients in experimental group and 50 patients in control group.

### Data collection tools

***Patient Information Form:*** This form contains personal information such as age, height, weight, health insurance, use of antiemetic drug during the last 24 hours, presence of any disease, or complaints, and also type and duration of anesthesia.

***State - Trait Anxiety Inventory (STAI):*** It was developed by Spielberger et al. for assessment of state and trait anxiety levels. Öner and Le Compte performed reliability and validity studies of this scale in Turkish population.

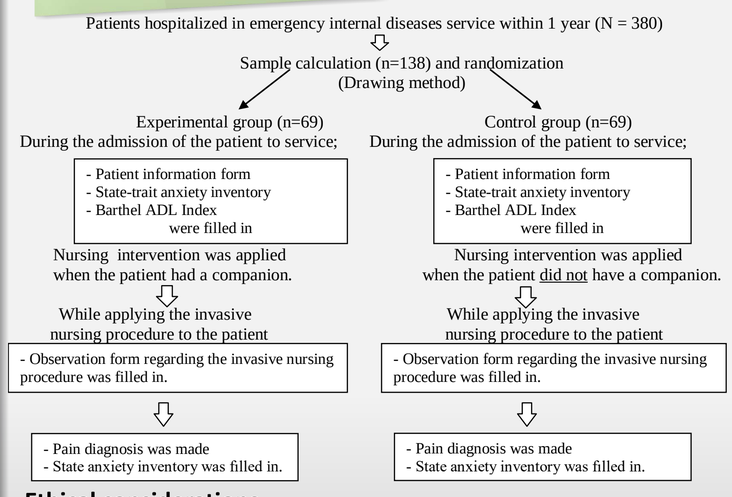
***Nausea and Vomiting Follow-up Form:*** It was used to document intensity of nausea (0-10 point visual analog scale) and presence of vomiting (1: present, 2: absent) at the following intervals postoperatively: 0-2, 2-6, 6-12, 12-24 and 24-48 hours. Thus, the group that used wristband (experimental group) and the group that received anti-emetics according to the institution's protocol/physician order (control group) were compared in terms of intensity of nausea and presence of vomiting.

***Perianesthesia Comfort Questionnaire (PCQ):*** It was developed by Kolcaba and Wilson [21], and validity and reliability study for Turkish version was conducted by Üstündağ and Eti Aslan .

***General Comfort Questionnaire (GCQ):*** It was developed by Kolcaba [22], and validity and reliability study for Turkish version was conducted by Kuğuoğlu and Karabacak.

## Procedure

### Research Design




### Ethical considerations

This study conforms to the principles of Human Rights Declaration of Helsinki. A written informed consent was obtained from the patients. The study was approved by Uludağ University Faculty of Medicine Clinical Research Ethics Committee, and directorship of Bursa Zübeyde Hanım Obstetrics Hospital.

## Finding

**Table 1.** The comparison of individual, disease and nausea experience characteristics of the experimental and control groups

| Individual, disease and nausea experience characteristics | Experimental (n=47) | | Control (n=50) | | $\chi2/ Z^{MW}$ p |
|---|---|---|---|---|---|
| | n | % | n | % | |
| **Age Categories (year)** | | | | | |
| 18-29 | 1 | 2,1 | 5 | 10,0 | |
| 30-41 | 5 | 10,6 | 9 | 18,0 | $\chi2$=7,633 |
| 42-53 | 39 | 83,0 | 29 | 58,0 | p=0,056 |
| 54-65 | 2 | 4,3 | 7 | 14,0 | |
| Age Median (min.-max.) | 45 (25-64) | | 44 (18-61) | | $Z^{MW}$= -0,799 p=0,424 |
| **Income status** | | | | | |
| The income meets expense | 26 | 55,3 | 33 | 66,0 | $\chi2$=1,160 |
| The income does not meet expense | 21 | 44,7 | 17 | 34,0 | p=0,281 |
| **Operation type** | | | | | |
| Hysterectomy | 18 | 38,3 | 22 | 44,0 | |
| hysterectomy +BSO* | 23 | 48,9 | 22 | 44,0 | |
| Myomectomy | 1 | 2,1 | 3 | 6,0 | |
| Ovarian Cyst Excision | 5 | 10,7 | 3 | 6,0 | 0,795 |
| **Operation experience** | | | | | |
| Yes | 19 | 40,4 | 18 | 36,0 | |
| No | 28 | 59,6 | 32 | 64,0 | 0,811 |
| **History of nausea and vomiting at previous operations **** | | | | | |
| Yes | 10 | 52,7 | 5 | 29,4 | |
| No | 9 | 47,3 | 13 | 70,6 | 0,229 |
| **Anesthesia type** | | | | | |
| General anesthesia | 11 | 23,4 | 9 | 18,0 | |
| General Anesthesia + Epidural | 33 | 70,2 | 37 | 74,0 | |
| General Anesthesia + Spinal | 3 | 6,4 | 4 | 8,0 | 0,781 |
| Duration of anesthesia (Minute) Median (min.-max.) | 90 (45-240) | | 90 (30-300) | | 0,977 |

$\chi2$=Kİ-Kare (Pearson Chi-Square, Fisher's Exact Test, Fisher-Freeman-Halton Test) Tests,
* BSO: Bilateral Salpingo Ooferektomi
** The individuals who were earlier surgery answered this question.

**Table 2.** The Comparison of experimental and control groups according to factors that may affect the nausea - vomiting

| Factors Affecting Nausea - Vomiting | Experimental (n=47) | | Control (n=50) | | $\chi2/ Z^{MW}$ p |
|---|---|---|---|---|---|
| | n | % | n | % | |
| **History of motion sickness** | | | | | |
| Yes | 15 | 31,9 | 9 | 18,0 | |
| No | 28 | 59,6 | 36 | 72,0 | |
| It would be before | 4 | 8,5 | 5 | 10,0 | 0,313 |
| **Smoking status** | | | | | |
| Yes | 15 | 31,9 | 10 | 20,0 | |
| No | 32 | 68,1 | 40 | 80,0 | 0,268 |
| **Central nervous system diseases** | | | | | |
| Yes | 7 | 14,9 | 6 | 12,0 | |
| No | 40 | 85,1 | 44 | 88,0 | 0,905 |
| **Gastrointestinal complaints** | | | | | |
| Yes | 10 | 21,3 | 14 | 28,0 | |
| No | 37 | 78,7 | 36 | 72,0 | 0,595 |
| **Chronic disease** | | | | | |
| Yes | 18 | 38,3 | 12 | 24,0 | |
| No | 29 | 61,7 | 38 | 76,0 | 0,193 |
| Body Mass Index (kg/m²) Median (Min.-Max.) | 29,34 (19,14-43,26) | | 28,31 (19,27-40,83) | | $Z^{MW}$ = -1,202 p=0,229 |

$\chi2$= Chi-Square (Pearson Chi-Square, Continuity Correction, Fisher's Exact Test) Tests

In order to prevent the confounding effect of individual, disease, nausea, anxiety characteristics, experimental and control groups should be similar according to these characteristics. In the present study, the experimental and control groups were similar in terms of the individual, disease, nausea, anxiety characteristics (Table 1, 2 and 3).

**Table 3.** The comparison of the State-Trait Anxiety Inventory scores of experimental and control groups at the hospital admission

| | Experimental (n=47) Median (min.-max.) | Control (n=50) Median (min.-max.) | P |
|---|---|---|---|
| Trait Anxiety Inventory (Potential range: 20-80) | 43 (28-57) | 44 (25-68) | 0,116 |
| State Anxiety Inventory (Potential range: 20-80) | 49 (23-65) | 49,5 (26-67) | 0,573 |

**Table 4.** The comparison of nausea - vomiting characteristics of the experimental and control groups at the postoperative period

| The nausea – vomiting characteristics | Experimental (n=47) | | Control (n=50) | | $\chi^2$ / MW p |
|---|---|---|---|---|---|
| | n | (%) | n | (%) | |
| **0-2 Hours** | | | | | |
| Vomiting | 7 | 14,9 | 11 | 22,0 | $\chi^2$=0,408 |
| No vomiting | 40 | 85,1 | 39 | 78,0 | p=0,523 |
| Nausea intensity (VAS) Median (Min.-Max.) | 0 (0-3) | | 3 (0-7) | | $Z^{MW}$ =-4,194 p<0,001 |
| **2-6 Hours** | | | | | |
| Vomiting | 5 | 10,6 | 14 | 28,0 | $\chi^2$=3,600 |
| No vomiting | 42 | 86,4 | 36 | 72,0 | p=0,058 |
| Nausea intensity (VAS) Median (Min.-Max.) | 0 (0-4) | | 0 (0-9) | | $Z^{MW}$ =-5,990 p<0,001 |
| **6-12 Hours** | | | | | |
| Vomiting | 13 | 27,7 | 15 | 30,0 | $\chi^2$=0,001 |
| No vomiting | 34 | 72,3 | 35 | 70,0 | p=0,976 |
| Nausea intensity (VAS) Median (Min.-Maks.) | 0 (0-9) | | 3 (0-9) | | $Z^{MW}$ =-3,503 p<0,001 |
| **12-24 Hours** | | | | | |
| Vomiting | 5 | 10,6 | 12 | 24,0 | $\chi^2$=2,139 |
| No vomiting | 42 | 89,4 | 38 | 76,0 | p=0,144 |
| Nausea intensity (VAS) Median (Min.-Max.) | 0 (0-5) | | 2,5 (0-6) | | $Z^{MW}$ =-4,585 p<0,001 |
| **24-48 Hours** | | | | | |
| Vomiting | 1 | 2,1 | 2 | 4,0 | p=1,000 |
| No vomiting | 46 | 97,9 | 48 | 96,0 | |
| Nausea intensity (VAS) Median (Min.-Max.) | 0 (0-3) | | 0 (0-4) | | $Z^{MW}$ =-2,323 p=0,020 |

**Table 5.** The comparison of the PCQ* and the GCQ** scores of the experimental and control groups at the postoperative period

| PCQ and GCQ | Experimental (n=47) | Control (n=50) | $\chi2/ t / Z^{MW}$ p |
|---|---|---|---|
| | n (%) | n (%) | |
| PCQ (Potential range: 0-6) Median (Min.-Max.) | 5,33 (4,58-5,79) | 4,87 (2,75-6,00) | <0,001 |
| **The GCQ Contexts** | | | |
| Physical (Potential range: 12-48) Median (Min-Max) | 37 (23-45) | 33 (21-45) | <0,001 |
| Psychospiritual (Potential range: 13-52) Median (Min.-Max.) | 48 (38-52) | 45 (34-52) | 0,001 |
| Environmental (Potential range: 13-52) Median (Min.-Max.) | 40 (32-51) | 39 (26-47) | 0,205 |
| Sociocultural (Potential range:10-40) Median (Min.-Max.) | 33 (28-38) | 31 (22-36) | <0,001 |
| **The GCQ Forms** | | | |
| Relief (Potential range: 16-84) Median (Min.-Max.) | 51 (36-58) | 46 (30-56) | <0,001 |
| Relaxation (Potential range: 17-68) Median (Min.-Max.) | 58 (50-66) | 54 (41-67) | 0,001 |
| Overcoming problems (Potential range: 15-60) Median (Min.-Max.) | 49 (39-57) | 47 (32-58) | 0,009 |
| The GCQ Total (Potential range: 48-192) Median (Min.-Max.) | 156 (125-173) | 148 (109-173) | <0,001 |

***Hypothesis 1 and 2***

Table 4 shows nausea and vomiting properties of the experimental and control groups at the post-operative period (0-48 hours). Accordingly, the experimental and control groups did not show difference in terms of presence of vomiting (p>0.05); however, there was a difference in intensity of nausea (VAS) that is in favor of the experimental group (p<0.05).

## Finding and Conclusions

***Hypothesis 3***

There was a difference in PCQ score that is in favor of the experimental group. When the experimental and control groups were compared for scores from different GCQ contexts, apart from the environmental context, the remaining context scores showed differences between the groups that were in favor of the patient group. Scores from different GCQ aspects showed differences between the groups that were in favor of the experimental group. Total GCQ score showed a difference between the groups that was in favor of the experimental group (p<0.05; Table 5).

### Conclusions

We determined that, instead of antiemetic medications, acupressure applied with wristband to P6 (Neiguan) acupuncture point at the wrist was effective in the prevention of vomiting and enhancement of comfort level after gynecological operations. It is concluded with these findings that wrist pericardium 6 acupuncture point acupressure application with wristband is effective at:

- prevention of nausea occurring at the postoperative period (first H1 hypothesis is confirmed)
- prevention of vomiting occurring at the postoperative period (second H1 hypothesis is conformed)
- enhancement of patient's comfort level (third H1 hypothesis is conformed).

## Implications for Future Research and Nursing Practice

We recommend that wrist pericardium 6 acupuncture point acupressure application with wristband and its effectiveness should be investigated in male patients and also cases that undergo surgeries of other systems. There should be studies that investigate knowledge levels of nurses working in surgical clinics about acupressure, which is one of the non-pharmacological methods. Training courses on acupressure techniques and their application, aimed at patients and relatives, should be planned, lectured, and their results should be analyzed.

Due to its effectiveness and feasibility, wrist pericardium 6 acupuncture point acupressure application with wristband can be used instead of pharmacological methods in patients who are likely to develop PONV.

### Limitations of study

Within the first 12 hours after the operation, acupressure with wristband was applied to the experimental patient group due to the difficulty of obtaining the wrist band. In fact, the wristband should be used before operation and stay 24 hours at patients’ wrist at postoperative period. On the other hand blinding patients couldn’t been provided. The patients have known that wristband or anti-emetics were used for PONV. The studies after this one, it can be suggested that the controls should have had bands on giving no pressure and the experimental group should have received saline injections. Also this study was conducted in an obstetrics and gynecology hospital on patients who underwent gynecological surgery. Therefore, the present results can only be generalized to female patients undergoing gynecological operation. The study population consists of female patients who underwent gynecological operation; both female sex and gynecological surgery are factors constituting risk for development of nausea and vomiting at the postoperative period. There is a need for further studies that investigate the effect of wrist pericardium 6 acupuncture point acupressure application with wristband on nausea and vomiting occurring at postoperative period, conducted on different study samples.

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