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RESEARCH ARTICLE

Effect of Acupressure at PC6 on Nausea and Vomiting During Pregnancy: a Randomized Controlled Trial

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Background: Nausea and vomiting are among the most common medical problems during pregnancy, affecting 80% of mothers.
Objectives: This study was conducted as a randomized controlled experimental study to determine the effect of acupressure applied by a wristband to the pericardium 6 (PC6) point on nausea and vomiting during pregnancy.
Methods: The study population consisted of 74 pregnant women between 6-14 weeks of gestation who were experiencing nausea and vomiting. The study data was collected with personal information from the Pregnancy-Unique Quantification of Emesis Scale (PUQE). Experimental and control groups were selected by a simple random method. The experimental group wore acupressure wristbands for one week, while the control group did not use any method to alleviate nausea and vomiting. One week later, the PUQE scale was applied to both groups.
Results: The acupressure wristbands decreased the nausea and vomiting scores of the pregnant women in the experimental group without statistical significance but did not change the nausea and vomiting scores of the pregnant women in the control group.
Conclusion: Acupressure wristbands can be used to prevent nausea and vomiting during pregnancy.

Keywords: Acupressure, Nausea, Pregnancy, Retching, Vomiting, Wristband

INTRODUCTION

Nausea and vomiting are among the most common medical problems during pregnancy, affecting 80% of mothers [1]. Changes in estrogen, human chorionic gonadotropin hormone (HCG), and progesterone levels secreted during pregnancy may cause nausea and vomiting. However, the pathology of nausea and vomiting in pregnant women is not fully understood, although there are several dominant theories [2].

Although death due to nausea and vomiting during pregnancy is rare, significant morbidities, such as splenic avulsion, acute tubular necrosis, Wernicke's encephalopathy, esophageal rupture, and pneumothorax have been reported [3]. In patients with nausea, tissue damage, loss of work, loss of time, and vomiting in early pregnancy are important public health problems due to increasing healthcare costs [2]. In addition, nausea and vomiting also have negative effects on the fetus. The most common adverse effect is low birth weight [4].

Few safety data are available for most antiemetic drugs for use during pregnancy. For this reason, women often resort to alternative treatments, such as distractions, relaxation techniques, systemic desensitization, hypnosis, therapeutic massage, acupuncture, and acupressure [5]. Of these alternative treatments, acupressure is the best choice because it is non-invasive, self-administered, and inexpensive [6].

Acupressure is a non-invasive treatment method that involves the application of physical pressure to specific acupuncture points using fingers, hands, elbows, or various devices [7,8]. Acupressure has grown in popularity in recent years and is the preferred alternative therapy [9]. Its efficacy has not been scientifically proven, but P6 pressure (inclination point located medially to the forearm at the wrist) is recommended to treat nausea and vomiting [10]. An alternative method, a PC6 acupoint stimulation, has been reported to reduce nausea and vomiting [11].

This study aims to evaluate the effect of acupressure applied to the pericardium 6 (PC6) point with a wrist band on

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pregnant women between 6-14 weeks of gestation on nausea and vomiting in pregnancy.

MATERIALS AND METHODS

The study was conducted with pregnant women between 6-14 weeks of gestation who were experiencing nausea and vomiting and who visited the obstetrics and gynecology outpatient clinic of a state hospital between July 3, 2020, and April 30, 2021.

Power analysis was performed using the G*Power (v3.1.9) program to determine an appropriate sample size. The sample size for determination of the effect of the acupressure wristband on nausea and vomiting during pregnancy (6-14 weeks) in the planned study was based on the following parameters: d = 0.59 (effect size), $\alpha = 0.05$ (error margin), $1-\beta = 0.80$ (power), and n2/n1 = 1 (sample numbers in the groups are equal). Along with the specified criteria, the sample numbers in both groups were calculated (n1 = 37; n2 = 37; a total of 74 people) using the G*Power package.

1. Inclusion criteria

Pregnant women without cognitive, emotional, or communication problems, those experiencing nausea and vomiting between 6 and 14 weeks of pregnancy, and those who volunteered for the study.

2. Exclusion criteria

Pregnant women with a history of hyperemesis gravidarum, with chronic diseases (hyperthyroidism, diabetes mellitus, and asthma), with psychiatric diseases, with a history of molar pregnancies or multiple pregnancies, with gastrointestinal diseases, under 20 years of age, and with wrist discomfort and scar tissue on their wrists.

Pregnant women were divided into experimental and control groups by a simple randomization method after inclusion and exclusion criteria were evaluated. Using a randomized number generator (random.org), the mothers were distributed into groups (experimental and control groups) (Fig. 1).

3. Procedures performed on the experimental group

After the purpose of the study was explained to the experimental group and written consent obtained, the pregnant identification form and the Pregnancy-Unique Quantification of Emesis Scale (PUQE) were filled in during face-to-face interviews. An easy-to-use wristband was outfitted with a special pin on an elastic band; the PC6 (Neiguan) point was measured, and the pin attached to the wristband. To locate the PC6 (Neiguan) acupuncture point, we measured from the wrist crease using three fingers; the point was found under the third finger, and the white pin on the band was placed on this point (Fig. 2) (Fig. 2 was taken during the application of the pin). The same procedure was conducted on the other wrist. The pregnant women were asked to wear the bands on both wrists for a week. They were informed that they could remove the wristband when needed to wash their hands and

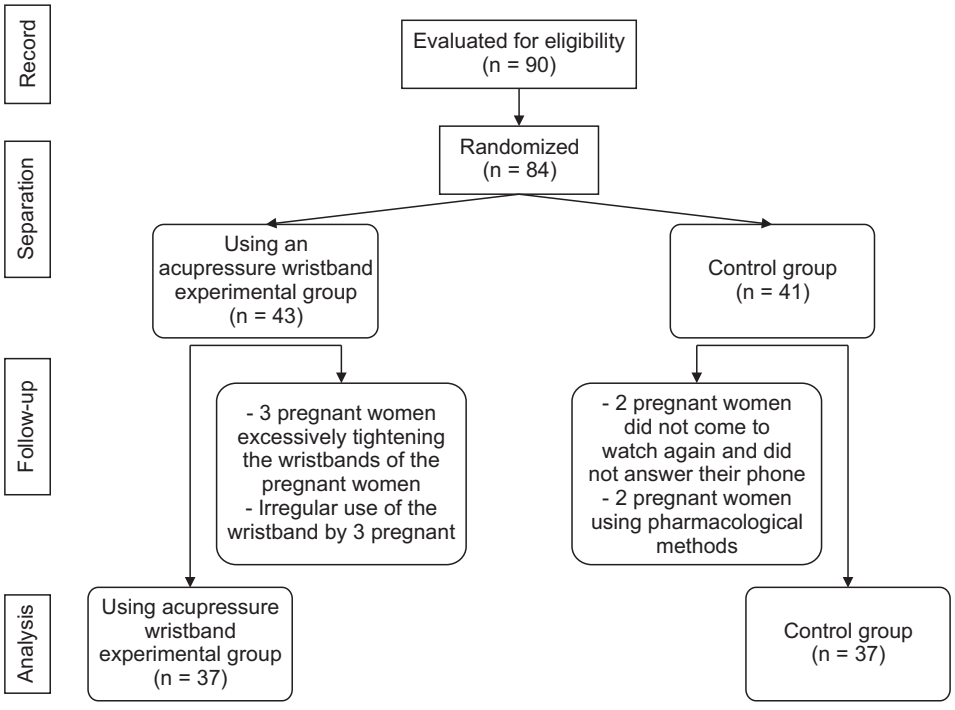

Fig. 1. Flow chart of the research.

arms or take a shower or to rest their wrists for ten minutes every eight hours but that they should put it back on as soon as possible. They were reminded that they could visit the outpatient clinic in case of severe nausea, vomiting, or any other unexpected situation. They were called to the outpatient clinic one week later, and the PUQE test was re-evaluated.

4. Procedures performed on the control group

After the purpose of the study was explained to the control group and written consent obtained, the pregnant identification form and the PUQE test were filled in in person. The women were reminded that they could visit the outpatient clinic again in case of severe nausea, vomiting, or any other unexpected situation. They were called to the outpatient clinic one week later, the PUQE test was re-evaluated, and the examination was ended. No fake application was made to the control group.

This study has been registered on the World Health Organization (WHO) website with the Universal Trial Number (UTN) U1111-1267-8534.

5. Statistical analysis

SPSS (Statistical Package for the Social Sciences) version 25.0 (IBM Corp., Armonk, NY, USA) was used for statistical analysis. While evaluating the study data, descriptive statistical methods (e.g., number, percentage, mean, and standard deviation) were used; the Mann–Whitney U and Kruskal–Wallis tests were used for quantitative comparisons between groups, and Chi-square tests (Pearson Chi-square, Continuity Correction, and Fisher's Exact tests) were used for categorical comparisons. The Wilcoxon Signed-Rank test was used for repeated measurements. The level of relationship between two variables was evaluated using the Spearman correlation test. The results were evaluated at the 95% confidence interval, and the significance level was $p < 0.05$.

6. Ethics approval

Permissions from the university's Traditional and Complementary Medicine (TCM) Application and Research Center (E-6254-2020.02.02) and the T.C. Ministry of Health, General Directorate of Health Services, Department of TCM and Functional Medicine (37106781-000-125398) were obtained. The purpose of the study was explained to the study participants, and their verbal and written consent was obtained using the Informed Consent Form. The study adhered to all ethical principles for human subjects.

7. Limitations of the study

Although the risk of miscarriage is high in the early stages of pregnancy, there is no evidence that miscarriage results by use of the wristbands in the 6-14 weeks period. Nevertheless, pregnant women sometimes refuse to use wristbands due to prejudice against the use of wristbands and because they are not widely used in society.

Table 1. Baseline characteristics of pregnant women by randomized group (n = 74)

Characteristics	n (%) Experimental group (n = 37)	n (%) No treatment control group (n = 37)
Age (years, mean ± SD)	28.70 ± 6.12	28.84 ± 5.14
Gestational age (weeks, mean ± SD)	9.32 ± 2.16	8.76 ± 2.02
Level of education		
Literate	5 (13.5)	1 (2.7)
Primary-secondary	11 (29.7)	12 (32.4)
High school	12 (32.4)	12 (32.4)
University	9 (24.3)	12 (32.4)
Nausea and vomiting in a previous pregnancy		
Yes	17 (45.9)	14 (37.8)
No	20 (54.1)	23 (62.2)
Parity		
1	12 (32.4)	7 (18.9)
2	5 (13.5)	15 (40.5)
3	12 (32.4)	10 (27.0)
≥ 4	8 (21.6)	5 (13.5)

SD = standard deviation.

Fig. 2. P6 acupressure application site localization.

Table 2. Nausea, vomiting, retching and total scores of PUQE by randomized group (n = 74)

PUQE test	Experimental group (n = 37)		No treatment control group (n = 37)		*p*-value	
	Baseline	After 1 week	Baseline	After 1 week	Baseline	After 1 week
Number of nausea in the last 12 hours	3.46 ± 0.99	2.32 ± 1.11	2.92 ± 0.95	2.62 ± 1.32	0.019	0.297
Number of vomiting in the last 12 hours	2.08 ± 0.98	1.54 ± 0.77	1.43 ± 0.77	1.57 ± 0.73	0.002	0.877
Number of retchings in the last 12 hours	3.16 ± 1.19	2.27 ± 1.12	2.59 ± 1.19	2.35 ± 1.03	0.044	0.747
PUQE total score	8.70 ± 2.60	6.14 ± 2.34	6.95 ± 2.30	6.54 ± 2.24	0.003	0.449

Data are presented as mean ± SD. *p*-values are from independent t-tests. PUQE = Pregnancy-Unique Quantification of Emesis.

RESULTS

The findings of the study carried out to determine the effect of acupressure applied to the pericardium 6 (PC6) point with a wristband on nausea and vomiting in pregnancy are presented in this section.

Table 1 shows the characteristics of the pregnant women in the study. The mean age of the experimental group of pregnant women was 28.70 ± 6.12 years, and the mean week of gestation was 9.32 ± 2.16. Examination of the education levels of the pregnant women indicated that 29.7% were primary school graduates, 32.4% were high school graduates, 24.3% were university graduates, and 13.5% were literate. Of the women, 45.9% experienced nausea and vomiting during their pregnancy, and it was determined 32.4%, 13.5%, 32.4%, and 21.6% were experiencing their first, second, third, and fourth or later pregnancies, respectively.

The mean age of the control group was 28.84 ± 5.14 years, and the mean week of gestation was 8.76 ± 2.02. Examination of the education levels of the pregnant women indicated that 32.4% were primary school graduates, 32.4% were high school graduates, 32.4% were university graduates, and 2.7% were literate. Of the women, 37.8% experienced nausea and vomiting during their pregnancy, and it was determined that 18.9%, 40.5%, 27.0%, and 13.5% were experiencing their first, second, third, and fourth or later pregnancies, respectively (Table 1).

In Table 2, PUQE scores of the experimental and control groups at the first measurement and after one week were compared using the independent t-test. The related sample t-test was used to determine the difference between groups with repeated measurements ($p < 0.05$) (Table 2).

DISCUSSION

Although the cause of nausea and vomiting in pregnancy remains unknown, the effect of changing hormone levels is in question [2]. Increased HCG hormone levels, especially during pregnancy, can cause nausea and vomiting [12]. The use of drugs during this period may harm the fetus; therefore, pharmacological treatments are avoided. Non-pharmacological treatments, which are thought to be more reliable, are used instead [4]. Based on these ideas, an acupressure wristband was used in pregnant women to alleviate nausea and vomiting in the first weeks of pregnancy. In the study, compared with the control group, use of the acupressure wristband for one week significantly reduced nausea and vomiting during pregnancy, although the difference was not statistically significant. These data suggest that an acupressure bracelet can be used as a non-pharmacological method to prevent nausea and vomiting during pregnancy ($p < 0.05$) (Table 2).

Many studies have reported that acupressure applied to the pericardium 6 region with a wristband reduces nausea, vomiting, and retching in pregnant women. Although the studies were conducted with different groups and at different times, the same results were obtained. While nausea and vomiting decreased in the pregnant women in the experimental groups, no change was observed in nausea and vomiting in the pregnant women in the control groups [13-15]. Contrary to these studies, a systematic review of randomized studies found that P6 acupressure wristband application was not more effective than a placebo [16].

According to TCM, the commonly used acupressure P6 point helps a person relax their chest and mind and reduces excitement, nausea, and vomiting [17,18]. The results of our study are in agreement with previous studies that showed that acupressure treatment can be used for nausea and vomiting in pregnant women [15,19,20]. However, there is currently much less interest in the application of acupressure for nausea and vomiting. One study determined that 84.2% of pregnant women used complementary alternative medicine during their pregnancy, but only 0.5% of the pregnant women preferred acupuncture [21]. Another study determined that the most preferred non-pharmacological methods of alleviating nausea and vomiting were vitamin B6 (13%), ginger (13%), other natural products (11%), and acupressure bands (5%). Acupressure is used less often than other methods [22].

Study results show that acupressure therapy to the P6 point reduces symptoms of nausea and vomiting in pregnant women. Information resources on the use of acupressure in our country are insufficient. More evidence-based studies are needed to evaluate the use of the acupressure band.

CONCLUSIONS

Nausea and vomiting during pregnancy are inevitable. Pharmacological methods for its prevention are avoided to avoid harming the fetus. The TCM method, which is more reliable, assists in the reduction of nausea and vomiting during pregnancy. Although the acupressure wristbands used in the study did not alleviate symptoms with statistical significance, it decreased the nausea and vomiting scores of the pregnant women in the experimental group but not those of the pregnant women in the control group. The acupressure wristband can be used as an alternative to prevent nausea and vomiting during pregnancy.

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AUTHORS' CONTRIBUTIONS

MPY: Conception of the study and design, supervision of data collection and analysis. Drafted manuscript and critically revised the article. İY: Conception of the study and design, data collection, and analysis. Drafted manuscript. SY: Conception of the study and design, supervision of data collection and analysis. Drafted manuscript and critically revised the article.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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