JMCH Journal of Maternal and Child Health (2022), 07(02): 138-147
Masters Program in Public Health, Universitas Sebelas Maret

Research

The Effectiveness of Acupressure Points PC-6 and SP-3 on the Hyperemesis Gravidarum in Pregnant Women

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ABSTRACT

Background: Handling of nausea and vomiting in first trimester mothers (emesis gravidarum) is mostly still using pharmacological therapy, even though there is a simple event by using massage at acupuncture points to treat emesis gravidarum. The purpose of this study was to analyze the effectiveness of PC-6 and SP-3 acupressure on emesis gravidarum in first trimester pregnant women.
Subjects and Method: This study is a quasi-experimental research design using a control group pretest-posttest design. The study was conducted in July-August 2021. The population in this study were all pregnant women who experienced nausea and vomiting in the 1st trimester in the Nurobo Health Center Work area, Malacca Regency. A total of 40 pregnant women in the 1st trimester were used as samples which were divided into 4 groups of 10 people each, namely group 1 (PC-6 acupressure), group 2 (SP-3 acupressure), group 3 (combination of PC-6 and SP-3 acupressure), and group 4 or control group (vitamin B6). The sample was selected by consecutive sampling technique. Data analysis using Wilcoxon Rank-Test and Paired T-Test.
Results: After intervention of accupressure in PC-6 point, SP-3 point, or combination of both PC-6 and SP-3 reduced frequency of vomiting and nausea and duration of nausea.
Conclusion: accupressure in PC-6 point, SP-3 point, or combination of both PC-6 and SP-3 reduce frequency of vomiting and nausea and duration of nausea in pregnant women.

Keywords: emesis gravidarum, PC-6 acupressure, SP-3 acupressure

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Cite this as:
Ria MB, Manek BD (2022). The Effectiveness of Acupressure Points PC-6 and SP-3 on the Hyperemesis Gravidarum in Pregnant Women. J Matern Child Health. 07(02): 138-147. https://doi.org/10.26911/the-jmch.2022.07.02.03.

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BACKGROUND

Emesis gravidarum is one of the most common complaints and affects millions of pregnant women worldwide every year. Emesis gravidarum is experienced by about 70-80% of pregnant women and is a phenomenon that often occurs at 5-12 weeks of gestation. Pregnancy has an impact on normal physical and psychological changes in the mother. One of the physical changes in pregnant women is in the gastrointestinal tract, namely the occurrence of emesis gravidarum which usually occurs in early pregnancy, even in some mothers, nausea and vomiting of pregnancy lasts up to the third trimester (Dainty Maternity, 2017; Saleha, Nurlaily and Yusran, 2007). 2018).

The cause of emesis gravidarum is still not known with certainty but is generally associated with hormonal changes. According to several studies stating that the HCG hormone is the cause of emesis gravidarum,

the results show that women who experience nausea and vomiting have HCG hormone levels of 1600/IU/L and 3200 IU/L, the increase in hormone levels is estimated to be very high because in women who do not Pregnant women have an average hormone level of 5 IU/L (Irmayasari, 2009; Puget et al., 2018). Changes in carbohydrate and lipid metabolism that cause hypoglycemia, especially when pregnant women wake up, stimulate the occurrence of morning sickness. The pathogenesis of nausea and vomiting is still unclear, but there is a consensus that this disorder is multifactorial and various genetic, endocrine and infectious factors may be involved. Stress experienced by pregnant women in early pregnancy also causes nausea and vomiting (Bai et al., 2016; Bustos et al., 2017).

Emesis gravidarum can have serious consequences for both mother and baby. Severe and persistent emesis gravidarum can progress to hyperemesis gravidarum especially if the woman is unable to maintain adequate hydration, fluid, electrolyte and nutritional balance. Persistent low food intake and/or frequent vomiting can lead to dehydration, metabolic imbalance, nutritional deficiencies and weight loss. Severe maternal weight loss in early pregnancy or inadequate body weight has been associated with adverse fetal outcomes such as preterm delivery and growth restriction. The impact that often occurs and harms the fetus due to severe vomiting can result in premature birth and low birth weight (LBW) (Sulistiarini et al., 2018; Chambers et al., 2019).

The common way that is often done in overcoming emesis gravidarum in pregnant women is using pharmacology by consuming multivitamin tablets. Vitamin B6 is an option to treat and reduce emesis gravidarum. The mechanism of action of pyridoxine in overcoming emesis gravidarum has not been clearly explained, but the way it works is to convert protein from food into amino acids that are easily absorbed and needed by the body. Pyridoxime also converts carbohydrates into energy this role allows pyridoxine to overcome nausea and vomiting but there is a study that says vitamin B6 can not reduce the frequency of nausea and vomiting (Pressman and Buff, 2007; Adlan et al., 2017).

There are other ways that can actually be used to reduce emesis gravidarum besides pharmacological treatment such as giving vitamin B6 above. One therapy that is believed to reduce the frequency of nausea and vomiting in pregnant women is to perform acupressure massage on pregnant women. Massage on acupressure points for pregnant women is one type of non-pharmacological treatment with very minimal side effects.

Suppression or simulation at points P6, ST36 and SP 3 is believed to improve the flow of energy or chi in the stomach so that it can help reduce stomach disorders, including nausea and vomiting. reduce nausea and vomiting impulses in the chemoreceptor trigger zone and vomiting center (Rajin and Ghofar, 2015). Adlan et al. (2017) suggested that beta endorphins are one of the endogenous antiemetics that can inhibit the stimulation of nausea and vomiting in the vomiting center and CTZ. This study is in line with the research conducted by Putri et al. (2014) entitled The Effect of Acupressure on Morning Sickness in North Magelang District, the results of this study indicate that ST 36 and PC 6 acupressure points are effective in reducing morning sickness. The effectiveness of this non-pharmacological therapy is comparable to antiemetic drugs in the prevention of nausea and vomiting (Syarif, 2011; Oktaviani & Mardiyono, 2014; Negarandeh et al., 2020).

Based on the above background, the researcher intends to conduct research on the effect of giving acupressure at points PC-

6 and SP-3 on nausea and vomiting in pregnant women. This study was conducted with the aim of knowing the effectiveness of giving acupressure at points PC-6 and SP-3 on nausea and vomiting in pregnant women.

SUBJECTS AND METHOD

1. Study Design

This study is a quasi-experimental study with a control group pre-test-post-test design. The research was conducted from July to August 2021 in the Nurobo Health Center Work area, Malacca Regency, East Nusa Tenggara.

2. Population and Sample

The population in this study were all pregnant women who experienced nausea and vomiting in the first trimester in the Nurobo Public Health Center, Malacca Regency, East Nusa Tenggara, Indonesia. Determination of the sample size in this study was estimated by the formula for testing the hypothesis on the average of two independent groups which can be calculated as many as 10 subjects for each group, so the number of samples needed is 40 subjects. In this study, the sampling technique used was consecutive sampling.

3. Study Variables

The dependent variable in this study was emesis gravidarum. The independent variables in this study were the administration of PC-6 acupressure and SP-3 acupressure.

4. Operational Definition of Variables

PC-6 acupressure was defined as constant pressure for 2 minutes every day for 4 days using the fingers right at the PC-6 point on the body, which is 5 cm from the distal wrist crease between the flexi carpi cardialis and parmalis longus tendons.

SP-3 acupressure was defined as constant pressure for 2 minutes for 4 days using the fingers right at the SP-3 point on the body which is located between the tendons of the flexor carpi radialis and palmaris longus muscles, approximately 3 fingers above the fold of the hand.

Emesis gravidarum was defined as a symptom of nausea that is usually accompanied by vomiting and is physiological in nature as a result of pregnancy that occurs in the first trimester of pregnancy, both in the morning and throughout the day in first trimester pregnant women.

5. Study Instruments

Data collection in this study was carried out using questionnaires and observation sheets. Data about the characteristics of the subject was taken using a questionnaire. Data about the subject's emesis gravidarum were taken using an observation sheet using the PUQE-24 scale, namely the duration of nausea, vomiting frequency and frequency of nausea and vomiting. Meanwhile, the data regarding the administration of PC-6 and SP-3 acupressure were taken using an observation sheet.

6. Data analysis

The data are grouped into predetermined categories and tabulated and then analyzed statistically, using univariate and bivariate analysis. Univariate analysis was used to describe the frequency and homogeneity test of the variables studied for the characteristics, namely age, occupation, and parity. Nausea and vomiting frequency scores before and after the intervention in group 1 (PC-6 acupressure), group 2 (SP-3 acupressure), group 3 (combination of PC-6 and SP-3 acupressure), and group 4 or control group (vitamin Acupressure). B6) is presented in the form of a frequency distribution table.

To test the difference before and after the intervention in each group. If the data is normally distributed, a paired t-test is performed and if it is not normally distributed, the Wilcoxon Rank Test is used.

7. Research Ethics

Research ethical issues, including consent, anonymity, and confidentiality, were handled with care throughout the research process. The research ethics permit approval letter was obtained from the Health Research Ethics Committee of the Buleleng School of Health, Indonesia, No. 041/EC-KEPK-SB/III/2021, on March 30, 2021.

RESULTS

1. Sample Characteristics

The characteristics of the subjects in this study were age, occupation, and parity with a sample of 40 subjects. The results of these characteristics describe the results of the research which will be presented in the form of table 1 below.

Table 1. Frequency Distribution of Subject Characteristics

Variable	Group 1		Group 2		Group 3		Control	
	n	%	n	%	n	%	n	%
Age								
<20 years	2	20%	1	10%	2	20%	1	10%
20-35 years	7	70%	7	70%	6	60%	7	70%
>35 years	1	10%	2	20%	2	20%	2	20%
Occupation								
Working	4	40%	4	40%	5	50%	7	70%
Unemployed	6	60%	6	60%	5	50%	3	30%
Parity								
Primigravida	5	50%	3	30%	4	40%	3	30%
Multigravida	5	50%	7	70%	6	60%	7	70%

Note:
Group 1 Acupressure PC-6
Group 2 Acupressure SP-3
Group 3 Acupressure PC-6 and SP-3
Vitamin B6 Control Group

Based on table 1, it is known that most of the mothers aged 20-35 years in the subject group receiving PC-6 acupressure (70%), the group giving SP-3 acupressure (70%), the group giving PC-6 and SP-3 acupressure (60%). %) and control group (70%).

Based on the type of work, in the group of subjects who received PC-6 acupressure, most of them did not work, as many as 6 people (60%). In the group of subjects with SP-3 acupressure, most of them did not work, as many as 6 people (60%). In the group of subjects with a combined acupressure administration of PC-6 and SP-3, half worked (50%) and half did not work (50%). In the control group, the subjects who were only given vitamin B6 mostly worked as many as 7 people (70%) (Table 1).

Table 1 also shows the parity of the subjects. It is known that in the group receiving a combination of PC-6 acupressure, half were primigravida (50%) and half were multigravida (50%). In the group of subjects receiving SP-3 acupressure, most of them were multigravida, as many as 7 people (70%). In the group of subjects who received a combination of PC-6 and SP-3 acupressure, it was found that most of them were multigravida, as many as 6 people (60%). In the control group, most of them were multigravida, as many as 7 people (70%).

2. Data Normality Test

The normality test of the data is normally distributed if the $p > 0.05$ and not normally distributed if the $p < 0.05$. The results of

the normality test using Shapiro-Wilk can be seen in the Table 2.

Table 2. Normality of data for intervention and control groups

Group		Variable		
		Nausea Duration (p)	Nausea Frequency (p)	Vomiting frequency (p)
Group 1	Before	0.025	0.049	<0.001
	After	0.055	0.028	0.049
Group 2	Before	0.364	0.122	0.076
	After	0.055	0.012	0.024
Group 3	Before	0.194	0.037	0.273
	After	0.055	<0.001	0.005
Control (Group 4)	Before	0.338	0.055	0.049
	After	0.012	0.338	0.248

Table 2 shows that the results of the normality test of the data in the intervention group 1 show the results of p <0.05, meaning that the data is not normally distributed, so the hypothesis test uses the non-parametric Wilcoxon Rank-Test test. In groups 2, 3, and 4, the results are > 0.005, meaning that the data is normally distributed, so the hypothesis test uses the Paired sample T test.

3. Bivariate Analysis

Overview of the Average Before and After Administration of PC-6 Acupressure on the Duration of Nausea, Frequency of Nausea, and Frequency of Vomiting in Emesis Gravidarum 1st Trimester Pregnant Women.

Table 3. Different Paired Data Test for Each Group of PC-6 Acupressure on Duration of Nausea, Frequency of Nausea, Frequency of Vomiting in Emesis Gravidarum Pregnant Women in the 1st Trimester

Variable	Acupressure PC-6				p
	Before		After		
	Mean	SD	Mean	SD	
Nausea duration	3.11	1.05	1.89	0.78	<0.001
Nausea frequency	3.00	0.89	1.33	0.50	<0.001
Vomiting frequency	2.78	0.98	1.67	0.87	0.001

Table 3 shows that the duration of nausea (Mean= 1.89; SD= 0.78) was lower after PC-6 acupressure treatment than before (Mean= 3.11; SD= 1.05), and it result was statistically significant (p <0.001). The frequency of nausea (Mean= 1.33; SD= 0.50) was lower after PC-6 acupressure than before (Mean= 3.00; SD= 0.89), with p <0.001). The frequency of vomiting (Mean= 1.67; SD= 0.87) was lower after PC-6 acupressure than before (Mean= 2.78; SD= 0.98), with p= 0.001.

Table 4. Different Paired Data Test for Each Group of SP-3 Acupressure on Duration of Nausea, Frequency of Nausea, Frequency of Vomiting in Emesis Gravidarum Pregnant Women in the 1st Trimester

Variable	Acupressure SP-3				p
	Before		After		
	Mean	SD	Mean	SD	
Nausea duration	3.44	1.24	2.00	1.12	0.008
Nausea frequency	2.78	0.83	1.56	0.73	0.005
Vomiting frequency	3.00	1.00	2.11	1.17	0.009

Table 4 shows that the duration of nausea (Mean= 2.00; SD= 1.12) was lower after SP-3 acupressure than before (Mean= 3.44; SD= 1.24), with p= 0.008. The frequency of nausea (Mean= 1.56; SD= 0.73) was lower after SP-3 acupressure than before (Mean= 2.78; SD= 0.83), with p= 0.005. The frequency of vomiting (Mean= 2.11; SD= 1.17) was lower after SP-3 acupressure than before (Mean= 3.00; SD= 1.00), with p= 0.009.

Table 5. Paired Data Difference Test for Combination of PC-6 and SP-3 Acupressure on Emesis Gravidarum

Variable	Acupressure PC-6 and SP-3				p
	Before		After		
	Mean	SD	Mean	SD	
Nausea duration	3.44	0.88	2.89	0.60	0.005
Nausea frequency	3.11	0.78	2.56	0.88	0.008
Vomiting frequency	3.00	0.71	2.44	1.13	0.006

Table 5 showed that duration of nausea (Mean= 2.89; SD= 0.60) was lower after combination of PC-6 and SP-3 acupressure than before (Mean= 3.44; SD= 0.88), with p= 0.005. The frequency of nausea (Mean= 2.56; SD= 0.88) was lower after combination of PC-6 and SP-3 acupressure than before (Mean= 3.11; SD= 0.78), with p= 0.008. The frequency of vomiting (Mean= 2.44; SD= 1.13) was lower after combination of PC-6 and SP-3 acupressure than before (Mean= 3.00; SD= 0.71), with p= 0.001.

Table 6. Paired Data for Each Group Giving Vitamin B6

Variable	Acupressure PC-6 and SP-3				p
	Before		After		
	Mean	SD	Mean	SD	
Nausea duration	3.44	0.88	2.89	0.60	0.051
Nausea frequency	3.11	0.78	2.56	0.88	0.095
Vomiting frequency	3.00	0.71	2.44	1.13	0.095

Table 6 shows that the duration of nausea (Mean= 2.89; SD= 0.60) was lower after vitamin B6 consumption than before (Mean= 3.44; SD= 0.88), with p= 0.051. The frequency of nausea (Mean= 2.56; SD= 0.88) was lower after vitamin B6 consumption than before (Mean= 3.11 SD= 0.78), with p= 0.095. Frequency of vomiting (Mean= 2.44; SD= 1.13) was lower after vitamin B6 consumption than before (Mean= 3.00; SD= 0.71), with p= 0.095.

DISCUSSION

The administration of PC-6 acupressure on the duration of nausea, the frequency of nausea, and the frequency of vomiting for nausea and emesis gravidarum showed that the results of the study on the average duration of nausea, the frequency of nausea and the frequency of vomiting there was a decrease in the intervention group before and after PC-6 acupressure was statistically different. which was significant in the nausea duration group ($p < 0.001$), the nausea frequency group ($p < 0.001$), and the vomiting frequency group ($p = 0.001$). This study is in line with the research studied by Fatema Tara Etc., The study showed the effectiveness of Pc-6 acupressure pericardium for 10 minutes and in 1 day 4 times in the morning, afternoon, evening and night on the subject, this treatment proved the

success of reducing nausea and vomiting in mothers pregnant (Tara, 2020).

According to research from Fitriana et al. (2012) indicate that there is an effect of giving citrus aromatherapy and pericardial acupressure on emesis gravidarum. Adlan et al. (2017) evaluate the efficacy of acupressure on the Neiguan point (Pericardium PC-6) as an adjuvant treatment during the inpatient management of severe nausea and vomiting in pregnancy. Their study found that the use of acupressure tape at the Neiguan point (PC-6) for 12 hours every day for three days for hospitalized patients with hyperemesis gravidarum significantly reduced symptoms of nausea, vomiting and vomiting and ketonuria and led to a decrease in hospitalizations.

Overview of Average Before and After Giving Acupressure SP-3 on the Duration of Nausea, Frequency of Nausea, Frequency of Vomiting in Pregnant Women

The table for giving SP-3 acupressure shows that the results of the study showed that the average duration of nausea, frequency of nausea, and frequency of vomiting decreased in the intervention group before and after SP-3 acupressure was performed, statistically there was a significant difference in the nausea duration group (p = 0.008), the nausea frequency group (p= 0.005), and the vomiting frequency group (p= 0.009). The results of this study support the hypothesis of the first study that SP-3 acupressure will cause a decrease in the mean duration of nausea, frequency of nausea and frequency of vomiting. This study is in line with Oktaviani and Mardiyono (2014), which examined SP-3 acupressure on reducing nausea in dyspepsia patients.

Another study that was in line with that stated that acupressure therapy for 30 minutes significantly reduced nausea in patients with dyspepsia in the intervention group (t= 7.91, p= 0.00) and between groups (z= -2.884, p= 0.01). The theory explains that the stimulus at several meridian points in the meridian will be transmitted by large diameter A-Beta fiber nerves to spinal nerves in the spinal cord and then contained substances to work as "control gates" before passing through afferent nerve fibers to transmission cells, cells transmission channel to the central nervous system by reducing discomfort, relaxing and decreasing nausea (Hakam et al., 2014; Oktaviani and Mardiyono, 2014).

Acupressure is used in acupuncture to prevent nausea and vomiting. The effect of stimulation of this point is not yet fully understood, but stimulation of this point is believed to increase the release of beta-endorphins in the pituitary and ACTH along the chemoreceptor trigger zone (CTZ) inhibiting the vomiting center. Massage is done by making a soft circle at that point. At first it is not recommended not to press too hard because it can make vomiting worse. If you feel comfortable, then the pressure can be done harder. This rubbing is done for 30 seconds to two minutes. Acupressure works fairly quickly, usually one to two minutes, for patients with digestive disorders (Hakam et al., 2014).

Overview of the Average Before and After Administration of PC-6 and SP-3 Acupressure on the Duration of Nausea, Frequency of Nausea, and Frequency of Vomiting in Trimester Pregnant Women

The table for giving PC-6 acupressure and SP-3 acupressure shows that the results of the study showed that the average duration of nausea, frequency of nausea and vomiting frequency decreased in the intervention group before and after SP-3 acupressure was performed, statistically there was a significant difference in the nausea duration group (p= 0.005), nausea frequency group

(p= 0.008), and vomiting frequency group (p= 0.006). The results of this study support the hypothesis of the first study that SP-3 acupressure will cause a decrease in the mean duration of nausea, frequency of nausea, frequency of vomiting and blood HCG levels. This study is in line with Oktaviani and Mardiyono's (2014) study which examined SP-3 acupressure on reducing nausea in dyspepsia patients.

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Differences before and after Vitamin B6 consumption on the duration and frequency of nausea, and frequency of vomiting in pregnant women

In the table for giving vitamin B6, the results showed that the average duration of nausea, frequency of nausea and frequency of vomiting decreased in the intervention group before and after being given vitamin B6 (p= 0.095), vomiting frequency group (p= 0.095). The results of this study showed that there was no effect of giving vitamin B6 on nausea and vomiting of pregnancy. Vitamin B6 is an option to treat and reduce emesis gravidarum. The mechanism of action of pyridoxine in overcoming emesis gravidarum has not been clearly explained, but the way pyridoxine works itself converts protein from food into benthic amino acids that are easily absorbed and needed by the body and pyridoxine also converts carbohydrates into energy. This role allows pyridoxine to overcome nausea and vomiting but there are a study that said vitamin B6 could not reduce the frequency of nausea and vomiting (Alan and Pressman, 2007).

AUTHOR CONTRIBUTION

Each author participated in this research and there is no conflict of interest. The first author plays a role in ensuring the success of research both in planning, processing, to reports and publication of research results. Meanwhile, the second author plays a role in assisting the entire research process carried out by the first author.

FUNDING AND SPONSORSHIP

The researcher would like to thank the Ministry of Education, Culture, Research and Technology; Directorate General of Higher Education, Research, and Technology. This research is a research grant with a Beginner Lecturer Research scheme.

ACKNOWLEDGMENT

The researcher would like to thank the Head of the Nurobo Health Center, Malacca Regency, East Nusa Tenggara and all staff who directly or indirectly helped in this research process. The researcher also thanks

all the subjects who have participated in this research.

CONFLICT OF INTEREST

There is no conflict of interest in this study.

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