

## ACUPRESSURE PC6 SELF-CARE FOR HYPEREMESIS GRAVIDARUM DURING THE COVID-19 PANDEMIC

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### Abstract

**Introduction:** Most pregnant women (50–90%) generally experience nausea and vomiting during pregnancy, which usually subsides at 16–20 weeks of gestation. Approximately 0.5–2 percent experience severe nausea and vomiting, known as HG, which necessitates hospitalization. Since 2.000, the Ministry of Health of the Republic of Indonesia has been developing acupressure self-care, among other things, by implementing acupressure training (Teknologi Tepat Guna – TTG) for mild complaints about health workers.

**Objective:** This review discusses several studies that demonstrated the effect of acupressure on HG, as well as the mechanism of acupressure, the points used, and treatment strategies.

**Method:** The Google Scholar and PubMed databases were searched for studies published between 2010 and 2020 on how acupressure affects HG using the keywords acupressure, hyperemesis gravidarum, and PC6 point. Randomized clinical trials on human subjects and studies that measured nausea vomiting index in pregnant woman as outcomes were included. Studies that did not include clinical effects of acupressure were excluded.

**Results:** The following studies on HG (n=4) were discovered. These studies suggested that acupressure might be considered to reduce symptoms of nausea and vomiting in pregnant women.

**Conclusion:** Acupressure at PC6 may reduce nausea and vomiting in pregnant women by influencing gastrointestinal function via nerve stimulation to inhibit cerebral cortex function. Self-care acupressure at the PC6 point may be a therapeutic option to reduce HG during the Covid-19 pandemic.

**Keywords:** Acupressure, Hyperemesis Gravidarum, PC6 point, Covid-19, Appropriate Technology

## **Introduction**

Hyperemesis gravidarum (HG) is a condition that threatens pregnant women who experience severe nausea and vomiting during pregnancy. Persistent nausea, vomiting, ketosis, and weight loss during pregnancy are symptoms of hyperemesis gravidarum.<sup>1</sup>

About 50-90% of pregnant women usually experience nausea and vomiting during pregnancy. This condition typically occurs between 16 and 20 weeks of gestation. About 0.5%-2% of pregnant women will have severe nausea and vomiting called "HG" that requires hospitalization.<sup>2</sup> The impact on pregnant women and fetuses includes psychosocial disorders, electrolyte imbalance, pre-eclampsia, and low birth weight (LBW) in infants.<sup>2</sup> In addition, HG can increase the risk of stunted fetal growth, congenital abnormalities, and congenital disabilities.<sup>3</sup> According to research on HG complications, maternal complications such as inadequate weight gain, premature birth, and placental detachment, while in the fetus, low birth weight can occur. The APGAR value at 5 minutes is low, which affects the maternal mortality rate (AKI) and child mortality rate (AKA), which indicates a country's health status.<sup>2</sup> Indonesia has determined priority programs nationally as an effort to reduce AKI and AKA.<sup>4</sup>

Self-care acupressure has been developed by the Ministry of Health of the Republic of Indonesia since 2000, among others, by holding an acupressure Appropriate Technology (TTG) training for minor complaints about health workers to be a guide to train the community.<sup>5</sup> Since March 2020, the world has been struggling with the COVID-19 pandemic, which makes acupressure self-care an option and therapeutic opportunity for various complaints through training for health workers to overcome various conditions that have proven effectiveness in order to improve health status.

Various studies have shown that acupressure at the PC6 point may help reduce nausea and vomiting. The National Institute for Health and Care Excellence (NICE) recommends acupressure at point PC6,<sup>6</sup> aligning with several obstetrical societies' recommendations in various countries. In addition, the location of the PC6 point on the forearm makes it easy to do acupressure independently so that independent acupressure at the PC6 point can be considered as a therapeutic option to reduce HG during the COVID-19 pandemic.<sup>3,7</sup>

## **Acupressure**

Acupressure is defined as stimulation at acupuncture points utilizing pressure or mechanical techniques. Pressure on acupuncture points is done as a substitution for the

acupuncture needle. It is performed on acupuncture points to obtain a functional response in the body that can be used to treat disease.<sup>8</sup>

There are acupuncture points all over the human body.<sup>7</sup> Acupuncture points are the closest points to the skin surface, and stimulation of these acupuncture points is the first step in acupressure. Most acupuncture points are areas with high electrical potential.<sup>8</sup> The principle of acupressure treatment is essentially the same as acupuncture and is relatively safe, non-invasive, and free from side effects.<sup>1</sup> The main principle of acupressure is to understand the local point (LP) and the distal point (DP). The pressure applied to the local points will bring a therapeutic response to the autonomic nervous system. Moreover, a Tender Point (TP) is a form of acupuncture point found in nociceptors and polymodal receptors.<sup>9</sup>

Several methods stimulate acupuncture points with acupressure, including elbows, fingers, feet, knuckles, palms, thumbs, or special tools such as stones, blunt wooden surfaces, and others.<sup>8</sup> According to WHO, acupressure is very safe but still needs attention in patients with blood clotting disorders, the use of anticoagulant drugs, a history of fractures, and the location of flat bones in the elderly.<sup>10</sup>

### **Acupressure Mechanism of Action**

The mechanism of action of acupressure can be explained according to the theory of gate control by Melzack and Wall.<sup>8</sup> Pressing the acupuncture points stimulates the brain four times faster than pain stimulation. Continuous stimulation will close the neural gate and block pain messages from reaching the brain, increasing the body's pain threshold for painful stimuli. Pressing on the acupuncture points activates tiny, myelinated nerve fibers in the muscles and transmits their stimulation to higher nerve levels, including the spinal cord, midbrain, hypothalamus, and pituitary axis, depending on the location of stimulation.<sup>8</sup>

Acupressure stimulation also activates a neuro-hormonal complex involving the hypothalamic-pituitary-adrenocortical axis to produce cortisol which causes relaxation. In addition, acupressure stimulation also increases endorphins and serotonin in the brain and body organs. Locally, acupressure stimulation affects local tissues. Acupressure stimulates the release of nitric oxide (NO), which increases local microcirculation through cyclic guanosine monophosphate (cGMP), which plays a role in improving physical performance by suppressing substances that cause fatigue.<sup>8</sup>

In general, acupressure can play a role in reducing tissue adhesion, increasing body relaxation, increasing blood circulation, and improving the parasympathetic system.<sup>8</sup>

### **Acupressure Research on Hyperemesis Gravidarum**

In 2020, Tara F et al. conducted a randomized multi-center clinical trial on 90 pregnant women with a gestational age of under 12 weeks to examine the efficacy of the Neiguan PC6 point by stimulating the suppression of nausea and vomiting to a certain

degree in pregnant women.<sup>11</sup> Assessment of nausea and vomiting used the Rhodes index on the first and fifth days (before and before treatment). Patients with singleton pregnancies with a gestational age of under 12 weeks were divided into three groups, namely: (1) suppression of Neiguan PC6 4 times a day for 10 minutes, (2) fake acupressure group, and (3) medication with vitamin B6 and metoclopramide. The severity of nausea, vomiting, and retching was measured using the Rhodes Index on the first and fifth days (pre-treatment and pre-treatment assessment). This study concluded that pressing the PC6 point of Neiguan can reduce the severity of nausea and vomiting in pregnant women.<sup>11</sup>

In 2017, AS Adlan et al. conducted a double-blind, randomized controlled trial in 120 pregnant women with a gestational age of 5-14 weeks to assess the efficacy of acupressure on the PC6 Neiguan point as an adjuvant therapy during hospitalization in pregnant women with nausea and severe vomiting. Pregnant women carrying singleton fetuses with a low risk of pregnancy were randomized and then placed into two groups: the treatment group with an acupressure band attached to the PC6 Neiguan point or a placebo group who received a similar bracelet without stimulation at the acupuncture point. There was a statistically significant improvement in the assessment of nausea and vomiting from the first day to the third day in the treatment group compared to the placebo group. There was also a significant improvement in the value of ketonuria in the treatment group. This study concluded that using an acupressure bracelet at the PC6 Neiguan point for 12 hours every day for three days in hospitalized patients with hyperemesis gravidarum significantly reduced nausea, vomiting, and ketonuria symptoms.<sup>1</sup>

In 2013, F Saberi et al. conducted a randomized controlled trial of 159 pregnant women before 16 weeks of gestation who experienced mild to moderate nausea and/or vomiting. Subjects were randomly divided into three groups: the acupressure group, the ginger group, and the control group. A pair of wrist bands were given to emphasize the PC6 Neiguan point in the acupressure group. Patients were taught to use it continuously for four days and only removed it when bathing. In the ginger group, patients were given 12 capsules of ginger 250 mg, brand Zintoma. The acupressure and ginger groups were given treatment for four days (days 4 to 7). The assessment of nausea and vomiting was using the Rhodes Index form on day four and day 8 (before and after therapy is finished). This study found that the ginger group was more effective than acupressure in overcoming nausea and vomiting in pregnant women with a gestational age of under 16 weeks, showing a decrease of 49% and 29%, respectively.<sup>12</sup>

In 2011, EJ Lee et al. conducted a systematic review study to review randomized controlled trials that examined the efficacy of acupressure for the treatment of a symptom in the period 1<sup>st</sup> January 2000 to 31<sup>st</sup> January 2010, that only used acupressure as a single therapy for 1 group. This study managed to collect 43 studies that will be reviewed. A total of 16 out of 23 studies concluded that acupressure is especially effective for treating nausea and vomiting in patients during pregnancy and chemotherapy. Then, 9 out of 10 studies concluded that acupressure is effective for pain management in patients with dysmenorrhea, during labor, and after trauma. Four studies concluded that acupressure

was effective for overcoming shortness of breath, and then six studies stated that acupressure was effective in improving fatigue and insomnia, but the bias level was relatively high. This study concludes that acupressure can treat various symptoms in various patient populations, but research with better designs is still needed.<sup>13</sup>

### Acupressure as adjuvant therapy in hyperemesis gravidarum

The point used in the HG is PC6 Neiguan, which is anatomically located on the anterior part of the forearm between the palmaris longus and flexor carpi ulnaris tendons, 2 B-cun proximal to the wrist crease. To determine the location of acupressure points using the patient's own hands

Stimulation of the PC6 point can be done by pressing or massaging as much as 20 to 30 times the pressure. The strength of the pressure is considered sufficient if one-third of the nail becomes white at the time the pressure is applied. The strength of the pressure is adjusted when using a blunt tool.<sup>14</sup>

Acupressure at the PC6 Neiguan point can help lower HG by influencing gastrointestinal function,<sup>15</sup> in addition to inhibiting cerebral cortex function through nerve stimulation, which can reduce nausea and vomiting.<sup>16</sup>



Figure 1. The location of PC6 Neiguan acupoint<sup>7</sup>



Figure 2. A force of pressure on acupuncture points<sup>7</sup>

## Discussion

The Government of the Republic of Indonesia has established a national priority program to improve public health status, among others, by reducing maternal mortality and infant mortality rates. In addition to traditional health efforts at community health centers (Puskesmas), there is a tendency to increase from 2015 to 2019. The acupressure self-care program is one of the components in health care at the community health center (Puskesmas).<sup>17</sup>

The doctors and health workers trained according to the curriculum and modules of the Ministry of Health to date have reached two thousand,<sup>18</sup>; this is a potential human resource to be included in the self-care program for pregnant women experiencing HG. The service model can follow the procedure for using acupressure self-care from the Ministry of Health, namely the doctor in charge of the patient (DPJP) screening selected cases, then the acupressure will be done by trained health workers. In addition to acupressure, healthcare workers also provide advice directly through printed media and audiovisual material that has been produced for this program.<sup>18</sup>

Since the end of 2019, the world has been hit by the SARCOV-2 disease, which has caused a pandemic. During the pandemic, there was a change in the order of health services. In midwifery services in the green zone area, the number of visits was set at ten people to implement health protocols, while in the red zone, the service was carried out through remote consultation. Changes in the management of this service will cause the patient to begin to adjust to new conditions.<sup>19</sup>

The decline in maternal and infant mortality has not shown the achievement of national or global targets. The target of the National Mid-Term Development Plan for the maternal mortality rate in 2024 is 183 per 100,000 live births, while the target for the Sustainable Development Goals (SDGs) is 70 per 100,000 live births. The causes of maternal death include postpartum hemorrhage, pre-eclampsia, and comorbidities. The target for the neonatal mortality rate is 10 per 100,000 live births, while the infant mortality rate is 16

per 1.000 live births. The causes of neonatal death include low birth weight infants (LBW), asphyxia, and congenital abnormalities.<sup>20</sup>

If hyperemesis gravidarum is not handled correctly, it can increase maternal and neonatal/infant mortality.<sup>6</sup> Acupressure self-care is an opportunity that can be done during the COVID-19 pandemic. The reason is that, among other things, it is a discipline that allows you to take care of yourself to be healthy. Through a healthy self, you can help others be healthy by keeping your distance (UCLA 2020).

World Health Organization stated that self-care could be carried out for promotional, preventive, curative, and palliative purposes. The preparation of self-care guidelines must be easily understood by every line involved.<sup>21</sup> In March 2020, NICE issued a draft on the use of acupressure and acupressure bands at the PC6 acupuncture point as an option for treating HG by every line involved in carrying out acupressure self-care. The safety of acupressure self-care at point PC6 can be accounted for by looking at the position and anatomical structure of that point.<sup>7, 22</sup>

Appropriate technology has been developed by the Ministry of Health of the Republic of Indonesia by publishing acupressure practical guidebooks and, in 2004, acupressure training books for health workers. Various books have been published from 2010/2011 to 2021, including the acupressure orientation curriculum for health center officers and their Training of Trainer and the TOGA and Acupressure Independent Care pocketbooks for the community. The book or guidelines have included material for nausea and vomiting in pregnancy, but particular guidelines for self-care acupressure in HG cases may be needed to make it more focused and easier to understand.

## **Conclusion**

Acupressure at PC6 may reduce nausea and vomiting in pregnant women by influencing gastrointestinal function via nerve stimulation to inhibit cerebral cortex function. Self-care acupressure at the PC6 point may be a therapeutic option to reduce HG during the Covid-19 pandemic.

## **Competing Interests**

No competing financial interests exist.

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