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Ginger (*Zingiber Officinale*) and Mint Leaves (*Mentha Piperrita L*) Alleviate Emesis Gravidarum

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ABSTRACT

Background: Emesis gravidarum is a feeling of nausea that appears in pregnant women, especially in the morning. Pregnant women experience nausea, vomiting, 2% in the morning, 80% throughout the day and 18% progress to delivery. In Indonesia, there are 50-75% cases of nausea and vomiting experienced by pregnant women. The cause is an increase in the hormones estrogen, progesterone and the secretion of hCG. The content in ginger (*Zingiber Officinale*) and mint leaves (*Mentha Piperrita L*) can reduce the incidence of emesis gravidarum thereby preventing bad health conditions of pregnant women that interfere with fetal growth and development.

Purpose: To know the effectiveness of giving ginger and mint leaves to reduce emesis gravidarum for pregnant women.

Methods: The research method used is the Quasy Experiment method with the Two Group Pre and Post-Test Design approach. The population of first trimester pregnant women is 60 people. The number of samples in each group was 4 women using the 2 free sample formula and purposive sampling technique. The results of the normal distribution test with the Saphiro Wilk test, the data are normally distributed so that it uses the paired t-test and the independent t-test.

Results: Based on the univariate test, it was found that the average before infusion of ginger was 9.25 and 5.25 after being given steeped ginger. On average, before being given the mint leaf steeped was 10.0 and after being given the mint leaf steeped was 7.00. Based on the paired t-test, it was found that the p-value of steeped ginger was 0.011 <0.05, while the p-value of steeped mint leaves was 0.024 <0.05. Based on the independent t-test, it was found that the effectiveness of giving steeped ginger and mint leaves was p-value 0.013 <0.05.

Conclusion: Ginger and mint leaves statistically alleviate emesis gravidarum in the first trimester of pregnancy. Midwives could suggest the women to consume ginger and mint leaves as alternative or complementary treatment of emesis gravidarum.

Keywords: Ginger; Mint Leaves; Emesis Gravidarum, Herbal remedy, Complementary therapy

BACKGROUND

Pregnancy causes physical, psychological and hormonal changes in the body of pregnant women. This causes nausea and vomiting (morning sickness) which usually occurs in early pregnancy (Irianti, 2015). Nausea, vomiting or emesis gravidarum usually begins between week 4 and week 7 in 80% of pregnant women and all at week 20 of gestation. Causes of idiopathic emesis gravidarum. Many believe it is caused by psychological factors, but there is very little data to support this theory. Many reports state hormonal changes during pregnancy, namely increased levels of *Human Chorionic Gonadotropin* (HCG), and decreased levels of thyrotropin stimulating hormone (Sharma, 2017). Another influential hormone is an increase in the hormone estrogen and progesterone hormone (Manuaba, 2014). Nausea and vomiting are also caused because high protein foods with low carbohydrates and vitamins are more likely to suffer from severe nausea such as not eating enough, lack of sleep or rest and stress can exacerbate nausea (Sarwono Prawirohardjo, 2014). Pregnant women experienced nausea, vomiting 2%, morning and 80% throughout the day and 18% continued until delivery (Manuaba, 2014). As many as 50-75% of pregnant women in Indonesia experience nausea and vomiting in early pregnancy (MoH, 2018).

If emesis gravidarum is not treated immediately, it will get worse into hyperemesis gravidarum which causes the mother to vomit continuously every time she drinks or eats, as a result the mother's body gets weaker, pale, and the frequency of urination decreases drastically so that body fluids decrease and the blood becomes thick (hemoconcentration) which slows down the circulation of blood, namely oxygen and tissues, so that it can cause tissue damage that can endanger the health of the mother (Parwitasari et al., 2015). Emesis gravidarum also causes side effects in the fetus such as abortion, low births, preterm birth, and malformation in newborns. Intrauterine growth retardation (IUGR) (Rusman et al., 2017).

Emesis gravidarum can be treated with pharmacological therapy, including by giving pyridoxine (B6 Vitamin) doxylamine, antiemetics, antihistamines and anticholinergics, corticosteroid drugs that have side effects of headaches, drowsiness, tingling, which can endanger the mother and the baby in the womb (Asri et al., 2019). Another best way is by non-pharmacological therapy using herbal plants, including ginger and mint leaves. Ginger and mint leaves are not only cheaper but also easy to find.

The content in ginger (*Zingiber Officinale*) contains *Zingiberena* (*zingirona*) essential oil, *zingiberol*, *bisabilena*, *curcumen*, *gingerol*, *flandrene*, vitamin A, and bitter resin which can block serotonin, a neurotransmitter that is synthesized in serotonergic neurons in the nervous system, center and enterochromafin cells in the digestive tract so that it is believed to be a feeling of comfort in the stomach so that it can overcome nausea, vomiting (Ningsih et al., 2020). The advantage of steeped ginger compared to other herbs is that ginger is a strong aromatic stimulant so that it can control vomiting by increasing intestinal peristalsis and in ginger there is an essential ingredient which has antiemetic or anti-vomiting activity which is effective and ginger is cheap, simple, effective, without effect the side to the disadvantage (Wardani et al., 2020).

Based on research from (Indrayani et al., 2018) with the title of research on the effectiveness of ginger on the frequency of nausea and vomiting of pregnant women in the first trimester in Bengkulu Utara Regency in 2017, there is a difference in the average frequency of nausea and vomiting before and after ginger intervention by 4, 80 where $p = 0.000$. Based on research from (D. A. Wulandari et al., 2019) with the research title warm ginger drink to reduce emesis gravidarum in pregnant women at Puskesmas Nalumsari Jepara that there is an effect of giving warm ginger drink on

emesis gravidarum in first trimester pregnant women at Puskesmas Nalumsari Jepara with a value of $p = 0.000$.

Apart from ginger, there are Mint leaves (*Mentha Piperita* L) which contain the main content of peppermint leaves (*Mentha Piperita* L) which are essential oils where menthol (90%) and the remaining flavonoids are methone, cineol, menthyl acetate, iso methone, limonene, tannin, piperitone, menthine, pinene and caryophyllene, diosphenol, diosphenolene. The mechanism of action mint leaves contain menthol which has the potential to smoothen the digestive system and relieve stomach spasms or cramps because it has a mild anesthetic effect and contains carminative and antispasmodic effects that act on the small intestine in the gastrointestinal tract so as to overcome or relieve nausea and vomiting. The advantage of mint leaves compared to other herbs is that mint leaves have an anesthetic effect which is useful for treating stomach cramps, bloating and providing comfort and relieving nausea and vomiting while essential oils are spicy so that they warm the body and the menthol which feels cold is stimulant useful for digestion and without adverse side effects (Asri et al., 2019).

According to research by (Banun et al., 2017) states that there is an effect of the effectiveness of peppermint leaf infusion in pregnant women to reduce the frequency of emesis gravidarum in Peterongan Village, Peterongan District, Jombang Regency with a p value of 0.000 ($\alpha < 0.05$). According to research (Asri et al., 2019) that there is an effect of giving mint leaf decoction on reducing nausea and vomiting in first trimester pregnant women with a P value = 0.008 (< 0.05).

According to research (Parwitasari et al., 2015) regarding the comparison between zingiber officinale and mint leaves, it was found that the ginger group was more effective than mint leaves. Ginger is proven to be effective in reducing complaints of nausea and vomiting, but its use in pregnant women is still controversial. Comparative research on the use of ginger and mint leaves is still very limited. Therefore this study will examine the effect of consuming brewed ginger and mint leaves on the symptoms of emesis gravidarum in pregnant women in their first trimester. It is expected that this study could inform and strengthened the evidence on using the two herbal remedies can provide a faster reduction effect in emesis gravidarum.

OBJECTIVE

To know the effectiveness of giving ginger (*Zingiber Officinale*) and mint (*Mentha Piperita, L*) steeped ginger against emesis gravidarum in pregnant women in the first trimester at a Sarolangun District Clinic in 2020.

METHODS

The research method used is the Quasy Experiment method with the Two Group Pre and Post-Test Design approach. The research was conducted at the Sarolangun District Clinic in 2020 from January to March 2020. The population of first trimester pregnant women was 60 people who experienced emesis gravidarum. Purposive sampling was used and as many as 4 women involved in the study. Purposive sampling was chosen using the inclusion criteria include pregnant women with emesis gravidarum with a frequency of vomiting 3-4 times a day / within 24 hours, primigravida, 20-30 years of age, gestational age < 12 weeks, no allergies to ginger and mint leaves, and domiciled in Sarolangun District.

Data were collected using direct interview techniques and questionnaire sheets for nausea and vomiting, namely PUGE-24 (24-hour pregnancy Unique Quantification

of Emesis). As for the giving of 1 g of ginger brewed ginger + 150 ml of hot water and a little brown sugar is given once a day in the morning for 4 days. The dose of the ginger was used based on the previous study (Parwitasari et al., 2015).

Steeped mint leaves as much as 5 pieces (0.11 g) with 100 ml hot water and a little brown sugar is drunk once a day in the morning for 4 days. The results of the normal distribution test with the Saphiro Wilk test (Table 1), the data is normally distributed so that it uses the paired t-test and the independent t-test. This study has secured an ethical approval from the Prima Nusantara Bukittinggi health research ethics committee.

RESULTS

The results of the normal distribution test with the Saphiro Wilk test (Table 1), the data is normally distributed so that it uses the paired t-test and the independent t-test.

Table 1. Saphiro Wilk Normality Test

Variables	P-Value	Information
Pretest Seduhan Jahe	0,850	Normal
Posttest Seduhan Jahe	0,406	Normal
Pretest Seduhan Daun Mint	0,714	Normal
Post test Seduhan Daun Mint	0,683	Normal

Whilst Table 2 shows the effect of ginger (*Zingiber Officinale*) infusion on the frequency of emesis gravidarum in the first trimester of pregnant women.

Table 2. Effect of ginger (*Zingiber Officinale*) infusion on the frequency of emesis gravidarum in the first trimester of pregnant women

Emesis Gravidarum Frequency	n	Mean	Mean Different	SD	P-value
Pretest	4	9,25	4,00	1,414	0,011
Posttest	4	5,25			

Table 3 shows that the average Emesis gravidarum frequency of respondents before drinking mint leaf (*Metha Piperita L*) was 10.00 times and decreased to 7.00 times after the intervention. And SD = 1,414. Then there is a difference in the average frequency of Emesis Gravidarum respondents between before and after drinking mint (*Metha Piperita L*) with an average difference of 3.00 and p value = 0.024, meaning

that there is a significant difference in the average frequency of Gravidarum emesis between before and after drinking steeped Mint leaves (*Mentha Piperrita L*), which decreased after the intervention. Therefore, the provision of mint leaves (*Mentha Piperrita L*) has a significant effect on reducing Emesis gravidarum in pregnant women at the Sarolangun regency clinic.

Table 3. The effect of giving mint (*Mentha Piperrita L*) leaf infusion on the frequency of emesis gravidarum in the first trimester of pregnant women

Emesis Gravidarum Frequency	n	Mean	Mean Different	SD	P-value
Pretest	4	10,00			
Posttest	4	7,00	3,00	1,414	0,024

Table 4 shows that the average infusion of Ginger (*Zingiber Officinale*) was 4.00 and the steeped of Mint Leaves (*Mentha Piperrita L*) was 3.25 after the intervention. With SD = 1,414.

Table 4. The effect of steeped ginger (*Zingiber Officinale*) and steeped mint leaves (*Mentha Piperrita L*) on the frequency of emesis gravidarum for pregnant women in the first trimester

Emesis Gravidarum Frequency	n	Mean	Mean Different	SD	P-value
Pretest	4	3,25			
Posttest	4	4	0,75	1,414	0,013

Then there is an average difference using ginger (*Zingiber Officinale*) and mint leaves (*Mentha Piperrita L*) in reducing the frequency of Emesis Gravidarum with a p value of 0.013 with this average difference. So between ginger (*Zingiber Officinale*) and mint leaves (*Mentha Piperrita L*) which is more effective is the steeped of Mint Leaves (*Mentha Piperrita L*) which significantly reduces Emesis gravidarum for pregnant women at the Sarolangun District Clinic.

DISCUSSION

1. Effect of Ginger Brewing on Emesis Gravidarum

From the results of the study, it means that there is a significant difference in the average emesis frequency of Gravidarum between before and after drinking ginger (*Zingiber Officinale*), which decreased after the intervention. Therefore, the administration of ginger (*Zingiber Officinale*) has a significant effect on decreasing emesis gravidarum for pregnant women at the Sarolangun District Clinic.

According to (Elsanti et al., 2017) Emotional factors can also cause nausea and vomiting in pregnancy, women who get high social support from their husbands and family members during pregnancy without experiencing emesis gravidarum.

The symptoms of nausea and vomiting can be prevented by using ginger. In this context, it has been reported that ginger contains gingerols and shogaols which

inhibit cholinergic M3 receptors and 5-HT3 serotonergic receptors and act in the digestive tract as dopamine and serotonin antagonists which increase gastric morality (Bustos et al., 2018). Gingerol and other components of ginger are known to have anti-hydroxytryptamine activity through experiments on the ileum. Galanolactone, another ingredient in ginger, is a competitive antagonist to the ileus - HT receptor, which exerts anti-emetic effects (Rufaridah et al., 2019).

In experimental studies with pigeons, that gingerol affects the central nervous system so that it is associated with serotonergic and dopaminergic components in mediating its antiemetic effect (Ullah et al., 2015). The content in ginger (*Zingiber Officinale*) contains *Zingiberena* (zingirona) essential oil, zingiberol, bisabilena, curcumen, gingerol, flandrene, vitamin A, and bitter resin which can block serotonin, a neurotransmitter synthesized in serotonergic neurons in the central nervous system. and enterochromafin cells in the digestive tract so that it is believed to be a feeling of comfort in the stomach so that it can overcome nausea, vomiting (Ningsih et al., 2020).

This research is in line with research (Rusman et al., 2017) study which found that before being given the intervention, the average respondent experienced the frequency of nausea and vomiting 13 times a day, after being given the intervention warm ginger drink on average the frequency of nausea and vomiting decreased to 3.18 times a day with a value of $p = 0.000$. So it is concluded that both clinically and statistically, warm ginger drink has an effect on reducing the frequency of nausea and vomiting in the first trimester of mothers.

Another supporting research is research (Indrayani et al., 2018) with the research title of the effectiveness of ginger giving to the frequency of nausea and vomiting of pregnant women in the first trimester in Bengkulu Utara Regency in 2017 that there is a difference in the average frequency of nausea and vomiting before and after the intervention of ginger is 4.80 with $p = 0.000$. Based on research from (Wulandari et al., 2019) with the research title warm ginger drink to reduce emesis gravidarum in pregnant women at Puskesmas Nalumsari Jepara that there is an effect of giving warm ginger drink on emesis gravidarum in first trimester pregnant women at Puskesmas Nalumsari Jepara with a value of $p = 0.000$. The strengths of this study were increasing the frequency of jade infusion in a shorter time, indicating a decrease in emesis gravidarum compared to previous studies.

2. Effect of mint leaves (*Mentha Piperita L*) on Emesis Gravidarum

There was a significant difference in the average frequency of emesis gravidarum between before and after drinking mint leaf (*Mentha Piperita L*), which decreased after the intervention.

The main content of peppermint leaves is menthol (90%) and the remaining *flavonoids* are methone, cineol, menthyl acetate, iso methone, limonene, tannin, piperitone, menthine, pinene and caryophyllene, diosphenol, diosphenolene. The mechanism of action of mint leaves is that menthol (90%) has the potential to smoothen the digestive system and relieve stomach spasms or cramps because it has a mild anesthetic effect and contains carminative and antispasmodic effects that act on the small intestine in the gastrointestinal tract so as to overcome or relieve nausea and vomiting (Asri et al., 2019). Mint leaves contain lots of essential oil, namely menthol which can relieve bloating, nausea, vomiting, cramps and contains a carminative effect that acts on the small intestine in the gastrointestinal tract so that it can overcome / eliminate nausea and vomiting (Harahap et al., 2020).

This is supported by research (Banun et al., 2017) that in a study entitled the efficacy of papermint by processing mint leaves in reducing emesis of pregnant women, it was found that there was a significant relationship between mint leaf processing and reducing symptoms of nausea and vomiting in pregnant women with p value 0.033 <0.05. Other supporting research (Wulandari, 2020) also found the effect of consuming brewed mint leaves to the frequency of emesis in the first trimester of pregnant women at the Sukorame Health Center, Kediri City, with a p value = 0.001. This research however, is contrary to research (Joulaeerad et al., 2018) using mint leaf oil aromatherapy and placebo showed that each group had a significant reduction in nausea and vomiting p <0.001 but there was no difference in decreasing nausea and vomiting between the two groups (p = 0.227) which could be a significant psychological disorder. increase nausea and vomiting of pregnant women. Many mint leaf interventions in the management of nausea and vomiting are given in the form of aromatherapy, but the intervention of steeped mint leaves is still limited.

3. Effectiveness of Steeped Ginger (*Zingiber Officinale*) with Steeped Mint Leaves (*Mentha Piperrita L*)

Ginger and mint leaves are therapeutic ingredients that are widely used to relieve symptoms of nausea and vomiting in pregnancy. Various dosage forms and levels are used where the use of ginger and mint leaves as therapy can relieve nausea and vomiting. It can be seen that the emesis frequency between ginger and mint leaves is p value 0.024 <0.05, while ginger p-value is 0.011 <0.05, with the Independent Test of t test, there is a difference between mint leaves and ginger. - value 0.013 <0.05). Changes in the mean before and after the intervention, steeped ginger was more effective, decreased by 4 compared to the intervention, steeped mint leaves only decreased by 3.

Emesis frequency in the mint leaf group of respondents before being given the intervention there were 2 respondents who experienced severe emesis gravidarum compared to the ginger intervention group, there was 1 respondent who experienced severe emesis gravidarum, after the intervention, the mint leaf group who experienced moderate emesis gravidarum were 2 respondents while for the ginger group after In the intervention there was 1 respondent who experienced moderate emesis gravidarum while 3 respondents experienced mild emesis.

The content of ginger has advantages over the content of mint leaves. The content in ginger (*Zingiber Officinale*) contains Zingiberena (zingirona) essential oil, zingiberol, bisabilena, curcumen, gingerol, flandrene, vitamin A, and bitter resin which can block serotonin, a neurotransmitter synthesized in serotonergic neurons that directly affects the system central nervous system and enterochromafin cells in the digestive tract so it is believed to be a feeling of comfort in the stomach so that it can overcome nausea (Ningsih et al., 2020). While the mint leaf content works in the form of menthol (90%) which works to the gastrointestinal system to smoothen the digestive system and relieve stomach spasms or cramps because it has a mild anesthetic effect and contains carminative and antispasmodic effects that work in the small intestine in the gastrointestinal tract so that it can overcome or eliminate nausea (Harahap et al., 2020).

This research is in accordance with the research conducted by (Asri et al., 2019) that there was a change in nausea and vomiting after being given ginger boiled water compared to mint leaves where before and after treatment the mean p-value was 0.000. Other research (Rochkmana & Widyawati, 2018) that there was a

change in nausea and vomiting after being given ginger boiled water compared to mint leaves where before and after treatment the mean p-value was 0.000. There are limitations in this study such as, the use of purposive sampling as well as the small number of respondents. Therefore, the use of probability random sampling and bigger number of participants are recommended in the future studies.

CONCLUSION

Steeped Ginger is more effective than steeped mint leaves. The administration of both is recommended as an alternative in non-pharmacological therapy in reducing the frequency of emesis gravidarum in pregnant women in the first trimester.

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