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THE EFFECT OF LEMON GINGER CANDY ON EMESIS COMPLAINTS IN PREGNANT WOMEN AT THE FIRST TRIMESTER

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ABSTRACT

Ginger is a herbal ingredient that contains gingerol and shogaol substances that are proven to reduce nausea (emesis). Lemon contains vitamin C and has a fresh aroma that can increase freshness and help reduce nausea in pregnant women. trimester. Objective: The purpose of this study is to find out the effect of lemon ginger candy on emesis complaints in pregnant women in the first. Method: This study uses a pre and posttest design with control group approach. The research location is in PMB of the Kemang Health Center in Bogor Regency in June - November 2021. The study sample was pregnant women in the first trimester who experienced nausea and vomiting. Sampling was carried out by purposive sampling techniques, with a sample of 30 people in the intervention group and 30 people in the control group. Pre-research begins with product trials, organoleptic tests and candy content tests. The intervention group consumed 5 grains of lemon ginger candy per day weighing @ 1 gram. Ten grams of lemon ginger candy contains 3 grams of ginger, 1.6 mg of vitamin C and 31.2 calories. Data collection was in the intervention and control group using the PUEQ questionnaire (Pregnancy Unique Quantification of Emesis and Nausea). Results: To determine the effectiveness of ginger candy consumption on the intensity of nausea and vomiting using the Mann-Withney test to determine the effectiveness of lemon ginger candy against complaints of emesis of pregnant women in the first trimester obtained a result of $p < 0.05$; there was a significant difference between the control group and the intervention group. Significant differences appeared from day 6 and day 7 of the intervention. Conclusions: Lemon ginger candy can be used as an herbal ingredient to reduce nausea in pregnant women.

Keywords: candy; emesis; first trimester; ginger; lemon; pregnant

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INTRODUCTION

Emesis gravidarum or other name nausea gravidarum (NVP) or better known as *morning sickness* is a symptom of nausea that is usually accompanied by vomiting. It generally occurs in early pregnancy (first trimester) between 5-12 weeks of pregnancy. (Manuaba, 2010)Sometimes it can continue until the 2nd and 3rd trimesters. Nearly 70-80% of pregnant women experience emesis.(Prawirohardjo, 2010) Nausea vomiting that occurs continuously and excessively can have an adverse effect on the mother and fetus. (Prawirohardjo, 2010) Some ways to reduce emesis complaints are dietary arrangements, drinking plenty of fluids (2-3 liters a day), reducing nausea stimulation (certain aromas/ odors), and taking antiemetic drugs or with herbal therapy. (Zhang Y, Cantor RM, MacGibbon K, 2017)

Ginger is an herbal ingredient that is believed to reduce nausea and vomiting in pregnant women. Ginger contains two active substances called gibgerol and shogaol. Both work on

digestive system receptors and help speed up gastric emptying. By emptying the stomach, the nausea will gradually disappear. (Goddess Aprili Ningsih. Metha Fahriani, 2020) According to *nutritional journal*, the provision of ginger supplements as much as 1.1-1.5 grams for pregnant women can reduce nausea significantly. (Allue, 2016)Another study conducted in america on 256 people who consumed 1 gram of ginger for 4 days can reduce the risk of vomiting nausea up to 5 times.(de Onis & Branca, 2016). Ginger also contains anti-inflammatories that can relieve abdominal pain that is usually experienced by mothers due to nausea and continuous vomiting. Consumption of ginger is also beneficial for the smooth digestion of pregnant women and reduces the possibility of stomach acid rising into the esophagus.(Carolin, Tiara Flower, 2022)(Allue, 2016)

Based on Meta Anaysis research conducted in America experts advice that pregnant women do not consume more than 10 grams of ginger in a day. The amount is equivalent to four cups of instant ginger tea. There is no evidence that ginger for pregnant women increases the risk of premature birth, miscarriage or other complications. Excessive consumption can cause headaches, dizziness, discomfort or heat, drowsiness, lethargy and diarrhea. However, meta-analysis research found no side effects of ginger on fetal conditions, so they recommended ginger as an alternative solution to reduce nausea in pregnant women.(Estelle Viljoen, 2017)

One of the herbal ingredients that are also believed to help overcome nausea and vomiting in pregnant women is lemon. Lemon has a fresh aroma and taste, one lemon contains niacin, calcium, magnesium, folate, vitamin C, vitamin B6 and riboflavin. (Ismail Biyik, 2020)According to the American Pregnancy Association lemon is known to relieve nausea associated with morning sickness in the first trimester of pregnancy.(Thomson, 2014) Consumption of lemon is also believed to reduce the flow of excess bile and the remaining deposits that accumulate through digestion. The distinctive aroma of lemon can also be a natural refresher, thus reducing nausea and vomiting. Research conducted in Padang in 2018, testing the effect of lemon aromatherapy on emesis, found that there was a significant reduction in the frequency of nausea and vomiting.(Nike Sari Oktavia, 2020) In line with the study in India, found that 66.5% of respondents eased their complaints of vomiting nausea after using the aroma of lemon therapy. (Parisa Yavari kia, 2014)

In addition, lemon can also help prevent common infections such as colds and fever because the content of vitamin C can improve the body's natural defense mechanisms, as well as effectively fighting bacteria and viruses.(Cirmi, 2017) The mother's daily requirement for vitamin C is 85 mg, which can be obtained from food and fruits. Lemon also has benefits to help the absorption of iron that the mother needs to help the formation of red blood cells and prevent anemia. Anti-oxidants in lemons can also reduce the risk of preeclampsia if consumed regularly. Some studies also prove that lemon can support fetal growth in the womb.(Pasha H, Behmanesh F, Mohsenzadeh F, Hajahmadi M, 2012)(Kato, 2016)

Consumption of ginger and lemon directly causes discomfort in the mother. Ginger has a strong texture and aroma so it cannot be directly consumed without prior processing. Likewise with lemons that have a very sour taste makes lemons can not be consumed directly. Therefore, lemon and ginger can be processed into a product that can be consumed easily, liked and still give the expected effect. One of them is processed in the form of sweets that are very practical for pregnant women to consume. The purpose of the study was to determine the effectiveness of ginger candy consumption on the intensity of nausea and vomiting.

METHOD

This study is a quasi-experimental study, using a pre- and posttest design with control group approach.(Notoadmojo., 2015)(Dr.Hasmi SKM, 2014) The sample was 30 pregnant women in the 1st trimester who experienced complaints of vomiting nausea.(Danang Snyoto, 2012) Data analysis is carried out by paired t test.(V.WiratnaSujarweni, 2014) Data collection was carried out by assessing the intensity of nausea and vomiting of pregnant women before and after the intervention.(Ari Setiawan Saryono, 2010) The intervention group consumed 5 grains of lemon ginger candy per day weighing @ 1 gram. Ten grams of lemon ginger candy contains 3 grams of ginger, 1.6 mg of vitamin C and 31.2 calories for one week.

RESULTS

Table 1.
Results of Analysis of Changes in Hyperemesis Complaints on Measurements Day 1 To Day 7 in Intervention and Control Group

Ke- PUEQ Score	N	Median (min-max)	Average ±sb	*p**	*p***
Intervention Group					
Before	30	15.50 (9-20)	15.57 ± 3,191		
Day-1 therapy	30	15.00 (9-19)	15.07 ± 2,970	0.015	
Day-2 therapy	30	15.00 (9-19)	14.70 ± 3.120	<0.001	
Day-3 therapy	30	14.50 (9-19)	14.47 ± 3.115	<0.001	<0.001
Day-4 therapy	30	14.00 (8-19)	13.80 ± 3.418	<0.001	
Day-5 therapy	30	11.00 (8-18)	12.60 ± 3.200	<0.001	
Day-6 therapy	30	10.00 (6-18)	10.40 ± 3,682	<0.001	
Day-7 therapy	30	9.00 (4-18)	9.27 ± 3,805	<0.001	
Control Group					
Before	30	15 (10-20)	15.00 ± 2.828		
Day-1	30	15 (10-20)	15.00 ± 2.828	1.000	
Day-2	30	15 (10-20)	14.87 ± 2,675	0.285	
Day-3	30	15 (10-20)	14.87 ± 2,596	0.336	<0.001
Day-4	30	14 (10-20)	14.60 ± 2,560	0.039	
Day-5	30	13 (9-20)	13.93 ± 3,140	0.001	
Day-6	30	13 (9-20)	14.00 ± 3.040	0.001	
Day-7	30	13 (9-20)	13.90 ± 3.133	0.001	

Table 1 of the Known in Control Group, shows that the value of $p<0.05$, is in the comparison between pretest and measurement of day 4 ($p=0.039$), day 5 ($p=0.001$), day 6 ($p=0.001$) and day 7 ($p=0.000$). In the Intervention Group, it showed that the value of $p<0.05$, was in the comparison between pre-test and measurements starting day 1 ($p = 0.015$), day 2 ($p = 0.000$), day 3 ($p = 0.000$), day 4 ($p = 0.000$), day 5 ($p = 0.000$), day 6 ($p = 0.000$), and day 7 ($p = 0.000$).

Table 2 Obtained variables with a value of $p < 0.05$, exist on the variable measuring emesis score on the 6th and 7th day. Thus it can be concluded that there is a significant difference between the group given the intervention and not on the 6th and 7th day.

Table 2.
Results of Analysis of Changes in Hyperemesis Complaints in Intervention and Control Group

Ke- PUEQ Score	N	Median (min-max)	Average ±sb	P*
Before Therapy				0.323
Intervention	30	15.50 (9-20)	15.57 ± 3,191	
Control	30	15 (10-20)	15.00 ± 2.828	
Day-1 therapy				0.710
Intervention	30	15.00 (9-19)	15.07 ± 2,970	
Control	30	15 (10-20)	15.00 ± 2.828	
Day-2 therapy				0.870
Intervention	30	15.00 (9-19)	14.70 ± 3.120	
Control	30	15 (10-20)	14.87 ± 2,675	
Day-3 therapy				0.893
Intervention	30	14.50 (9-19)	14.47 ± 3.115	
Control	30	15 (10-20)	14.87 ± 2,596	
Day-4 therapy				0.453
Intervention	30	14.00 (8-19)	13.80 ± 3.418	
Control	30	14 (10-20)	14.60 ± 2,560	
Day-5 therapy				0.094
Intervention	30	11.00 (8-18)	12.60 ± 3.200	
Control	30	13 (9-20)	13.93 ± 3,140	
Day-6 therapy				0.000
Intervention	30	10.00 (6-18)	10.40 ± 3,682	
Control	30	13 (9-20)	14.00 ± 3.040	
Day-7 therapy				0.000
Intervention	30	9.00 (4-18)	9.27 ± 3,805	
Control	30	13 (9-20)	13.90 ± 3.133	

*Mann Whitney Test

DISCUSSION

From the results of the study obtained data that in the control and intervention groups both showed a reduction in emesis complaints from day to day. However, in the emesis complaint intervention group, it has shown a reduction since the first day, while in the control group on the 4th day, there was a reduction in emesis complaints. In the intervention group, from the first day of the intervention (consumption of lemon ginger candy) began to have a significant reduction in emesis complaints in 11 respondents ($p = 0.015$), and from day to day respondents who experienced a reduction in emesis complaints more and more significantly every day. On the 7th day, the last day of data collection, 27 respondents out of a total of 30 people felt reduced emesis complaints. In the emesis complaint control group, it was not reduced in most respondents on the 1st to 3rd day. It is noted that only 2-3 people feel the complaint of emesis reduced. On the 5th day, respondents who felt their emesis complaints decreased a lot, namely 15 respondents and when compared to the pre-test of this data control group was significant ($p = 0.001$).(Santoso, 2017)

Emesis is a condition pregnant women experience nausea and vomiting that generally occurs in the morning when the stomach is empty overnight.(Manuaba, 2010) This vomiting nausea can occur several times until it can be more than 10 times in 24 hours. If it continues to be allowed this condition can affect the mother and also the fetus. Mothers will lack electrolytes

and nutritional deficiencies of nutrients that disrupt the body's systems and interfere with fetal growth.(Prawirohardjo, 2010) Emesis usually appears at the beginning of pregnancy, which is the age of 4-12 weeks of pregnancy. Although the exact cause of emesis is not yet known, but some studies have found risk factors for the emergence of emesis including stress, hormonal influences of estrogen and progesterone, hypoglycemia, HCG hormone, lack of nutrition and a history of stomach disease. Lemon ginger candy is made from extracts of ginger water and lemon water with its binding ingredients, namely glucose and gelatin. Lemon ginger candy has a nutritional content per five grains of candy, namely 3 grams of ginger, 1.6 mg of vitamin C, and 31.2 kcal. Ginger contains gingerol, shogaol, and zingibain which have been shown to reduce nausea, vomiting and flatulence.(Allue, 2016) Gingerol and shogaol substances act on the receptors of the digestive system and help speed up the emptying of the stomach, so eating digested faster, reduces the chances of food returning to the esophagus and reduces the intensity of nausea. This is in line with research on the provision of ginger supplements as much as 1-1.5 grams in pregnant women who are able to reduce nausea significantly (Vutyavanich, MD, MCS, 2001). This is in line with research conducted in Jakarta Indonesia on the influence of ginger consumption as much as 2.5 grams in 34 pregnant women proven effective in reducing emesis.(Goddess Aprili Ningsih. Metha Fahriani, 2020)

Lemon ginger candy is made from 100 grams of ginger water, 100 grams of lemon water, 250 grams of glucose, 20 grams of gelatin. After cooking, there is shrinkage so that the dough becomes 350 grams which is formed into 175 grains of candy with a weight of 2 grams each. So that gramasi each candy grain contains 3 grams of ginger. This level is a level that is still allowed to be given to pregnant women. Although there is no scientific evidence that giving ginger to pregnant women increases the risk of premature birth babies or abnormalities, the content of ginger that is allowed to be consumed by pregnant women is a maximum of 10 grams per day.(United States Department of Agriculture USDA., 2016) Respondents who consumed lemon ginger candy said that when chewing candy, the taste of ginger tastes right and tastes good. At night, the stomach feels warmer and complaints begin, flatulence or abdominal pain is rarely felt by most respondents. This is in line with a study in Thailand of 70 pregnant women with a gestational age of less than 17 weeks, for 4 days given ginger as much as 1 gram per day, it was found that ginger can reduce the severity of nausea and vomiting pregnant women.(Vutyavanich, MD, MCS, 2001)

In theory one of the causes of emesis is hypoglycemia (a condition of lack of sugar) in pregnant women, this occurs because the placenta absorbs the mother's energy for fetal needs, especially in the first trimester of pregnancy. Lemon ginger pemen contains calories that can add to the mother's daily calories, which is 31.2 calories. This number is still far from the daily calorie needs of pregnant women who reach 1800 per day. But in the condition of nausea and vomiting often makes the mother has no appetite, or even vomit food that has been eaten, so that the calories in the mother's body are very down. Calories in ginger candy is quickly absorbed and practically once to be consumed and meet the needs of the mother's guts in a short time. Other ingredients detected through laboratory test results are vitamin C, with levels of 0.32 mg or 1.6 mg five grains. This level is still far from the mother's daily requirement of 85 mg per day. However, the purpose of using lemon in this candy is also to take advantage of the aroma of fresh sour lemon. Pregnant women who are nauseated vomiting will have excessive saliva production because ptyalims increases its production automatically to neutralize stomach acid. This gives rise to stimulation to consume something sour and fresh. (Safajou F, 2020)

At the time of organoleptic testing conducted panelists said the aroma of lemon is very pronounced when the candy is chewed. Likewise, in respondents who were given sweets, they said the aroma and sour taste in the candy gave freshness and a good taste to the mouth to the throat. Lemon can also effectively overcome nausea due to increased stomach acid.(Parisa Yavari kia, 2014) The results of research in Turkey recommend that lemon candy (lollipop) is one of the solutions to overcome nausea for pregnant women who are very consensual from drugs that are at risk of causing teragonik. In addition, lemon candy is also a cheap and practical choice to overcome nausea. This they have tested in a study on 67 pregnant women in the 1st trimester who experience nausea and vomiting. (Ismail Biyik, 2020) The nature of sweets that are easily absorbed by the body and felt the effect since first chewed (entering the mouth), making the benefits of ginger candy can be felt directly by respondents.(West, 2017) Some respondents have felt the benefits since the 1st and 2nd day of consuming this lemon ginger candy. This is in line with research in Birjan-Iran on lemon aroma therapy to reduce nausea in 90 pregnant women, it was found that complaints of vomiting nausea were significantly reduced since day 2 after lemon aromatic therapy.(Safajou F, 2020)

CONCLUSION

Lemon ginger candy can be used as an herbal ingredient to reduce nausea in pregnant women.

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