



Investigating the Effect of GingerPill on the Treatment of Nausea and Vomiting of Pregnancy (NVP) in Pregnancy Women

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ABSTRACT

Background and purpose of the study: Nausea and vomiting are of the most prevalent complications of pregnancy usually ignored given the unwillingness to use chemical medicines. This study was a double-blind clinical trial to examine the effect of ginger pill on treating NVP. Methodology: To this end, 58 pregnant women during the 10th to 15th weeks of pregnancy with nausea and vomiting of pregnancy who were not treated before, were randomly selected from Mahshahr clinics and were treated with ginger for 3 days. The data collection method included a questionnaire with demographic data and Rodse questionnaire and examining the number and severity of nausea and vomiting. Prior to the intervention, every day during the study, and after the study, the severity and frequency of nausea and vomiting were evaluated. They were compared to each other before and after the intervention. Results: The results indicated that using ginger had a positive effect on reducing the severity and frequency of NVP. Discussion and conclusion: The results showed that ginger was effective in the treatment of pregnancy nausea and vomiting.

Key Words: Nausea, Vomiting, Pregnancy, Ginger.

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INTRODUCTION

Vomiting is the return of the stomach contents to the mouth with high pressure, which is different from gagging. Nausea is an unpleasant painless mental feeling that is a sign of vomiting in a few seconds [1]. NVP is considered as the most prevalent sickness during pregnancy, affecting up to 85% of pregnant women. Many pregnant women have doubts about using medicines given the risks for the fetus [2]. Severe pregnancy vomiting occurs in 2 to 3 percent of

pregnancies increasing the number of hospital care and hospitalizations that lead to disability, and reduce the life quality of patients periodically during pregnancy [3]. Common symptoms of NVP are a combination of nausea, gagging, dry mouth, vomiting, and aversion to smell and food. Non-treatment and prolonged periods of severe nausea and vomiting are the important causes of maternal stress and reduction in life quality [4]. Gastrointestinal symptoms are very common during pregnancy. Hormonal changes during pregnancy usually alter the normal functioning of the digestive system and

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may even exacerbate or induce digestive disorders [5]. Dealing with the significance of this issue is because women with mild to moderate NVP experience suffer depression, reduced function of employment, home activity, parental roles, and other physical and social activities. NVP increases the cost and use of health care resources. In addition, in some cases, pregnant women decide to terminate their pregnancy due to the complications of these symptoms [6]. It has been shown that preterm birth in the group with severe longing is clearly more prevalent than the patients with mild longing [7]. The risk factors for NVP include low maternal age, first pregnancy, female embryo, and twins [8]. In other studies, fetal abnormalities, history of nausea and vomiting in the previous pregnancy are related to mental and psychological conditions of the individuals, and the increase and decrease in BMI before pregnancy and the economic and social status associated with NVP [9].

Overall, the most important and commonly used NVP treatments include non-pharmaceutical treatments, such as special diets and the use of medication treatments. The popularity of complementary and alternative medicine, such as non-pharmaceutical treatments and herbal extracts has grown significantly in recent years, and the prevalence of using complementary and alternative therapies during pregnancy have been significant. In Iranian traditional medicine, one of the common treatments for NVP has been the use of ginger [10]. Ginger is an herb used in traditional medicine to treat all types of nausea and vomiting, such as NVP [11]. The precise mechanism of ginger as an anti-nausea and vomiting agent has not been completely known. Ginger seems to control the mechanism of the transmission of serotonin messages at the gastrointestinal system [12] that can be due to its direct effect on the intestinal duct. Its antiemetic effect through the central nervous system is debatable because there are compounds in ginger that inhibit type 3 serotonin receptors that have not been known well [13].

Firouzbakht et al. (2018) have compared the effects of ginger and vitamin B6 on NVP in Iran [14]. The researchers concluded that ginger is effective in treating NVP, but further studies are needed to determine the appropriate dose and its safety. In a study by Saberi et al. (2014) in Iran, the results showed that ginger is effective in reducing the symptoms of mild to moderate gestational nausea and vomiting before the 16th week of pregnancy [15]. Additionally, in Thomson et al. (2014) in Canada, ginger was mentioned as an effective non-pharmaceutical alternative for the treatment of NVP [16]. A meta-analytical study was conducted by Thomson et al. (2014) in Canada to study the effect of ginger on nausea and vomiting in early pregnancy. The results of the meta-

analysis of the study showed that ginger has been better than placebo for the improvement of nausea and vomiting in the early pregnancy, administered at a dose of about 1 g per day for at least 4 days. The researchers concluded that ginger is an effective non-pharmaceutical treatment for the treatment of nausea and vomiting early in pregnancy [16].

The present study examined the effects of oral ginger pills on the onset of NVP.

METHODOLOGY

This study was double-blind clinical trial. The samples were selected from among the women pregnancy who had been admitted to health centers in Mahshahr during the study and had the characteristics of the subjects, based on the purposive sampling. In the initial screening, Rodse Index questionnaire was given to pregnant women with NVP. If they were over 8, they would be selected. The samples were randomly assigned based on the inclusion criteria such as age range of 18-35, gestational age of 10-15 weeks, single pregnancy, LMP, or having accurate ultrasound, and the ability to read and write. After exclusion, 58 people were placed in the ginger group. In this study, the patients, the researchers and the providers of medical services were prevented from the medication regimen. In the next step, the questionnaire with demographic information was completed. The severity of nausea and vomiting was measured using Rodse index by the interviewer. The samples were asked to refrain from taking any medicines except for the type prescribed by the investigator. The participants received 9 pills of 500 milligrams of ginger, (Vomigone brand). The samples were taught to use three pills per a day (every 8 hours) for three days. The Rodse index questionnaire was filled up by the samples twice a day during the study period. They were asked to increase the number of smaller meals, to reduce high fat and high-carbohydrate foods, to avoid foods that cause nausea and vomiting, and to start eating before going hungry. Furthermore, they were asked to refrain from drinking carbonated beverages and eating fried, roasted and fast foods and eat a piece of dry bread when they woke up.

The exclusion criteria included the presence of disorders and diseases such as renal, hypertension, epilepsy, diabetes, hepatitis and digestive diseases that might lead to nausea and vomiting, unwanted pregnancy, malignant vomiting of pregnancy, smoking, abortion symptoms, misplaced pregnancy, mole, pregnancy after treatment for infertility, the incidence of adverse events in the past two months, such as severe problems with the spouse, the death of the spouse or first degree relatives, the patient

taking anti-nausea and vomiting medicines at least 3 days earlier, and sensitivity to ginger.

Finally, the collected data were analyzed using descriptive statistics and statistical tests in SPSS.

RESULTS

Table 1 shows that the ginger group showed no significant differences in terms of educational level, spouse's education level, employment status, economic status using Chi-square and mean maternal age, body mass index (BMI), the number of pregnancies and the number of deliveries using independent t-test and gestational age with Mann-Whitney test ($p > 0.05$).

Table 1: Demographic characteristics of the samples in the ginger group

Variables		Ginger (n=55) Mean \pm SD	P value
Age	Age (year)	27.4 \pm 4.9	0.916
BMI	BMI (kg/m ²)	25 \pm 4.3	0.079
Gravida	Gravida	2.6 \pm 1.3	0.519
Number of deliveries	Number of deliveries	1.3 \pm 1.1	0.384
Gestational age	Gestational age	12.4 \pm 1.9	0.412
Education	Primary	13(23.6)	0.268
	Guidance	17(30.9)	
	High school	22(40)	
	Academic	3(5.5)	
Spouse's education	Illiterate	3(5.5)	0.516
	Primary	16(29.1)	
	Guidance	19(34.5)	
	High school	14(25.5)	
Employment	Housewife	55(100)	0.315
	Employed	—	
Financial status	Weak	26(47.3)	0.846
	Average	21(38.2)	
	Good	8(14.5)	

Table 2 shows the relative and absolute frequency distributions of pregnant women in terms of the number of vomiting stated by the subjects in the ginger group. This table shows a significant difference between the frequency of vomiting before and after the intervention using Wilcoxon test ($p < 0.05$)

Table 2: Distribution of relative and absolute frequencies of pregnant women as stated by the subjects concerning vomiting in the ginger group

Variables		(n=55) Ginger	P value between the two groups
The frequency of vomiting before intervention	No (did not have)	29(52.7)	0.408
	1-2	18(32.7)	
	3-4	6(10.9)	
	5-6	1(1.8)	
	7 or more	1(1.8)	
The frequency of vomiting after intervention	No (did not have)	39(52.7)	0.095
	1-2	12(21.8)	
	3-4	1(1.8)	
	5-6	1(1.8)	
	7 or more	2(3.6)	
P value before and after intervention		0.047	

Table 3 indicates the distribution of relative and absolute frequencies of pregnant women in terms of the nausea in the ginger group as stated by the subjects. Table 3 shows a significant difference in the number of nausea before and after the intervention using Wilcoxon test ($p < 0.001$).

Table 3: Distribution of relative and absolute frequencies of pregnant women as stated by the subjects concerning nausea in the ginger group

Variables		(n=55) Ginger	P value between the two groups
The frequency of nausea before intervention	No (did not have)	----	0.537
	1-2	20(36.4)	
	3-4	24(43.6)	
	5-6	7(12.7)	
	7 or more	4(7.3)	
The frequency of nausea after intervention	No (did not have)	27(49.1)	0.352
	1-2	21(38.2)	
	3-4	5(9.1)	
	5-6	----	
	7 or more	2(3.6)	
P value before and after intervention		0.000	

Table 4 shows the distribution of absolute and relative frequencies of pregnant women as stated by the subjects concerning the severity of vomiting in the ginger and ondansetron group. The table shows a significant difference in vomiting severity before and after the intervention using Wilcoxon test ($p < 0.001$).

Table 4: Distribution of Relative and Absolute Frequencies of Pregnant Women in terms of the severity of vomiting in the ginger group stated by the subjects

Variables		(n=55) Ginger	P value between the two groups
The frequency of vomiting before intervention	No (did not have)	4(7.3)	0.843
	Mild	12(21.8)	
	Average	31(56.4)	
	High	7(12.7)	
	Severe (many times)	1(1.8)	
The frequency of vomiting after intervention	No (did not have)	25(45.5)	0.161
	Mild	21(38.2)	
	Average	7(12.7)	
	High	2(3.6)	
	Severe (many times)	---	
P value before and after intervention		0.000	

Table 5 shows the distribution of relative and absolute frequencies of the pregnant women in terms of the severity of nausea in the ginger group as stated by the subjects. Table 5 shows a significant difference in the number of nausea before and after the intervention using Wilcoxon test ($p < 0.001$).

Table 5: Distribution of relative and absolute frequencies of pregnant women as stated by the subjects concerning nausea in the ginger group

Variables		(n=55) Ginger	P value between the two groups
The severity of nausea before intervention	No (did not have)	3(5.5)	0.008
	Mild	14(25.5)	
	Average	31(56.4)	
	High	7(12.7)	
	Severe (many times)	---	

The severity of nausea after intervention	No (did not have)	27(49.1)	0.332
	Mild	17(30.9)	
	Average	10(18.2)	
	High	1(1.8)	
	Severe (many times)	---	
P value before and after intervention		0.000	

Table 6 shows P value before and after entering the study, and the P value difference before and after entering the study in the ginger group. Table 6 shows that P value of nausea severity before entering the study was significant ($P \text{ value} < 0.05$).

Table 6: P value before and after entering the study, and P value differences before and after entering the study in ginger group

Variable	P value before entering the study	P value after entering the study	P value differences before and after entering the study
Frequency of vomiting	0.4	0.09	0.01
Severity of vomiting	0.8	0.1	0.6
Frequency of nausea	0.5	0.3	0.2
Severity of nausea	0.008	0.3	0.002

Table 7 shows the mean and standard deviation of the total score of the Rhode index and the total score of the Rhode index (score-score) in the ginger group. Table 7 shows no significant differences between the total scores of Rhode index before and after using independent t-test ($p \text{ value} < 0.05$).

Table 7: Mean and standard deviation of the total score of the total Rhode index and total score of the Rhode index (score-score) in the ginger group

Group Variable	Ginger (N= 55)	P value
	Mean \pm SD	
Before intervention	12.61 \pm 3.7	0.022
After intervention	5.43 \pm 6.23	0.121
P value	$P < 0.001$	
Difference before and after intervention	7.18 \pm 5.42	0.000

DISCUSSION AND CONCLUSION

The study was a double blind clinical trial to examine the effect of ginger on NVP in Mahshahr health centers. NVP is more common in young women [17]. Refuerzo et al. (2015) stated that young women are more prone to NVP compared to older women, although the results of various studies in this regard have been contradictory [18]. In addition, the increase in the age of the mother has been associated with the late onset of the symptoms. The duration of the symptoms is related to the maternal age, so that in younger women, long-term nausea and vomiting (sustained symptoms more than 4 months regardless of the onset) have been more common [19]. In most similar studies, the average age of pregnant mothers under the investigation was in the range of 20-30, similar to the present study [20, 21].

There were no significant differences between the mean BMI using independent t-test ($P = 0.079$). Studies have shown that BMI can have a significant effect on the level of NVP. For instance, it has been shown that BMI below 22 can be associated with an increase in NVP [22]. Thus, the lack of differences between the two groups was very important in terms of BMI.

There were no significant differences in the mean of the number of pregnancies using independent t-test ($P=0.519$). Chan et al. (2011) considered the incidence of long-term nausea and vomiting (sustained symptoms for more than 4 months regardless of its onset) related to the number of pregnancies [19]. They indicated that these symptoms were more common in multigravida women.

The comparison of the mean number of deliveries using independent t-test showed no significant differences ($P = 0.384$). Refuerzo et al. (2015) stated that young nullipara women are more prone to NVP compared to the older multipara women [18]. It was also found that the mean gestational age in the ginger recipient group was 12.4 ± 1.9 weeks, where no significant differences were found using Mann-Whitney test ($P = 0.412$). It has been found that gestational age can have a significant relationship with severity of nausea and vomiting. Mostly it begins in the first trimester and finish in mid-second trimester [19]. The comparison of educational level using Chi square test showed no significant differences ($P=0.268$). NVP is more prevalent among women with less than 12 years of education [17]. Zahra et al., (2017) showed a significant relationship between the level of women's health literacy and their NVP [23]. It seemed that the increase in education has been associated with the increased awareness of improving nausea and vomiting. In addition, comparing the level of education between spouses using Chi-square test showed no significant differences ($P = 0.516$). Barat et al. (2014) have found that the occupation

and education of spouse of the pregnant women had a significant relationship with the prevalence of vomiting and history of stomach pain in pregnant women with the frequency of both nausea and vomiting [24]. Thus, controlling this variable was considered as a study requirement as well.

Chi square test showed no significant differences in employment status ($P = 0.315$). It seemed that the risk of NVP in pregnant women was higher in housewives, whereas the probability of these symptoms was lower in office workers [17]. Chi square test showed that the participants were significantly different in terms of economic status ($P=0.846$). Faramarzi et al. (2015) have shown that pregnant women with nausea and vomiting had lower social support and lower socioeconomic status compared to the pregnant women without nausea and vomiting [25]. Thus, it was necessary for the groups not to be significantly different regarding socioeconomic status.

The comparison of the frequency of vomiting before the intervention was insignificant ($P = 0.408$). The comparison of vomiting frequency after the intervention showed that the group did not differ significantly ($P = 0.095$). It was also found that the frequency of vomiting before ($P = 0.000$) and after the intervention ($P = 0.047$) did not differ significantly, which was consistent with previous studies. For instance, Abol Ghasemi (2002) has indicated the effect of ginger on reducing the frequency of vomiting in pregnant women [26]. In addition, Sripramote and Lekhyananda (2003) well indicated that ginger could significantly reduce vomiting in pregnant women compared with placebo [27].

Comparing the frequency of nausea before the intervention showed that the group did not differ significantly ($P=0.537$). Comparing the vomiting after the intervention showed that the group did not differ significantly ($P=0.352$). It was also found that the frequency of nausea before ($P= 0.000$) and after the intervention ($P = 0.000$) did not differ significantly. Comparison of the severity of vomiting before the intervention showed that the group did not differ significantly ($P=0.843$). The comparison of the severity of vomiting after the intervention showed that the group did not differ significantly ($P=0.161$). Furthermore, it was found that the severity of vomiting before ($P = 0.000$) and after the intervention ($P = 0.000$) did not differ significantly. The comparison of severity of nausea before the intervention showed that the group did not differ significantly ($P=0.008$). The comparison of severity of nausea after the intervention showed that the group did not differ significantly ($P = 0.332$). Moreover, it was shown that the severity of nausea before ($P = 0.000$) and after the intervention ($P=0.000$) did not differ

significantly. Abol Ghasemi et al. (2004) indicated that ginger could significantly reduce the severity of nausea compared to placebo that was consistent with the current study [21].

Overall, the results of the inferential analysis of the data showed a significant difference between the frequency of vomiting before and after the intervention ($P=0.012$). The severity of vomiting before and after the intervention was insignificant ($P=0.612$). The severity of nausea before and after the intervention was insignificant ($P = 0.002$). The frequency of nausea ($P=0.230$) did not differ significantly before and after the intervention.

There were no significant differences between the total score of Rhode index before and after the intervention using independent t-test ($P>0.05$). The mean and standard deviation of total Rhode index scores reduced after the intervention.

Hence, the study indicated that using ginger during pregnancy could significantly reduce NVP. Concerning the effect of using ginger on the embryo, it seemed that ginger could be seen as a safe treatment in this regard.

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