Effects of Ginger Capsules on Pregnancy, Nausea, and Vomiting

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Abstract

Objective: The aim of this study was to determine the effects of ginger in nausea and vomiting of pregnancy. Design: This was a single blind clinical trial study. Setting: The study was conducted in a selected prenatal care clinic of Isfahan City hospitals. Subjects: The subjects included 67 pregnant women who complained of nausea and vomiting from Isfahan city hospitals participated in the study. Intervention: The participants were randomly assigned to two groups, an experimental group and a control group. The groups were matched according to the age, gestational age, parity, occupational status, and educational level of the participants. The experimental group received ginger 250 mg capsules for 4 days, and the control group received placebo with the same prescription form. Outcome measures: Effects of treatment of nausea were evaluated twice daily for 4 days by a before-and-after treatment questionnaire. Results: The mean ages of the experimental and control groups were 24.1 ± 4.8 and 23.3 ± 5 years, respectively. The mean gestational age was 13 ± 3 weeks, and the mean parity was 1.6 ± 0.8. The ginger users demonstrated a higher rate of improvement than the placebo users did (85% versus 56%; p < 0.01). The decrease in vomiting times among ginger users was also significantly greater than among the women who received the placebo (50% versus 9%; p < 0.05). Discussion: A daily total of 1000 mg of ginger in a capsule preparation can be suggested by care providers as a means of decreasing pregnancy nausea and vomiting in women who tend to herbal medicines. Conclusion: Ginger is an effective herbal remedy for decreasing nausea and vomiting during pregnancy.

Introduction

The most common, specific, and unpleasant complications of pregnancy are nausea and vomiting.¹ Some 50%-90% of women experience these complications during their pregnancy.² These conditions of pregnancy have undesirable effects on the women's family and social life, as well as on their careers; psychological and economic problems may also arise as a result of these complications.³,⁴ Various alternatives that have been offered to work out the complications range from changes in diet and lifestyle to drug treatment.⁵ Most antinausea drugs are in the Food and Drug Administration’s Category C for pregnancy, however, so little information is available about their safety during pregnancy.⁶

In recent years a trend toward use of non-chemical drugs and complementary therapies has developed.² One of the proposed herbal remedies is ginger, provided in capsule form. Ginger is a nutritional complement and is on the U.S. Food and Drug Administration (FDA) list of safe herbal preparations.⁷ It is also on the list of herbal drugs in the WHO monograph.⁸ Shogaol and Gingtol are the effective substance in ginger that have local effects on the digestive system. It should be mentioned that ginger has been used for thousands of years in several countries, including China, where 30 g of ginger powder is usually used to cook a ginger cake. This herb is listed in the pharmacopoeias of the United Kingdom, Thailand, and China as an effective herb in treatment of nausea and vomiting during pregnancy.⁹,¹⁰

Successful use of ginger in treating the nausea and vomiting of pregnancy has been demonstrated in several modern reports.¹¹-¹⁴ However, there is no consistent evidence to show safe dosage and form of ginger administration during pregnancy. Fischer-Rasmussen et al.¹¹ and Vutyavanich et

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al.13 demonstrated significant improvement in pregnancy nausea and vomiting in women using capsules containing 250 mg of ginger, 4 times a day for 4 days, and Keating and Chez14 showed a significant decrease in first-trimester nausea and vomiting in women who consumed ginger syrup (containing 250 mg of ginger in honey and water in 1 tbsp) 4 times per day for 14 days.

Ginger effects have also been compared with vitamin B6 effects. Sripramote and Lekhyanada15 compared the efficacy of 500 mg of ginger 3 times daily to 10 mg of vitamin B6 in the treatment of nausea and vomiting of pregnancy, and Smith et al.16 compared the efficacy of 350 mg of ginger 3 times daily with 25 mg of vitamin B6, both of which were administered to subjects 3 times per day for 3 weeks. The two groups showed that the effects were equivalent. It seems that there have not been adequate controlled clinical trials to show an appropriate effective dosage of ginger.

Therefore, the present study was designed to assess the effect of 1000 mg daily of ginger administered in capsule form on the severity of nausea and vomiting during pregnancy among clients of Isfahan health centers.

Materials and Methods

This single-blind controlled clinical trial used randomized continuous sampling to recruit a study group of 70 pregnant women between June and July 2005. These women were under 20 weeks gestational age, without any medical or surgical history, without a history of smoking or drug use, and with mild and moderate nausea, with or without vomiting. Isfahan Ebne Sina-, Malek Shah-, Isfahan Khaneh-, and Rahman- Health centers and Isfahan Shahid Beheshti hospital were the settings of the study.

The aim and the procedure of the study were explained to the subjects. Written consent was obtained from those who accepted the conditions of the study. Participants understood that they had the option to leave the study at any time. They were also informed that any cost resulting from the study would be paid by the researchers.

After giving written consent, participants were asked to complete a form that contained demographic questions and a 0–10 scale on which to measure the severity of nausea and vomiting during the previous 24 h (before treatment). The standard visual analogue scale was used (Fischer-Rasmussen et al.),11 where 0 = the absence of nausea and 10 = the most severe condition of nausea.

The participants were randomly assigned to one of two groups, an experimental group and a control group. The experimental group was matched with the control group regarding demographic and obstetrical characteristics, such as age, gestational age, gravid and parity, employment, and level of education.

Four (4) ginger capsules were prescribed daily to the experimental group. Each capsule contained 250 mg of ginger-root powder sold under the trade name Zintoma (Goldaroo Company, Tehran, Iran). Capsules that were similar in appearance but that contained only lactose were prescribed to the control group with the same dosing instruction. The participants were blinded to the content of the capsules.

All participants were advised to avoid fatty foods and to eat less food at each meal during the course of the study, but to increase the number of meals consumed each day. A 4-page questionnaire was given to each subject, to be completed one page a day for 4 days. In addition, the women were asked to record nausea intensity on the analogue scale twice a day (at noon and at bedtime). Validity and reliability of the scale were confirmed by a pilot study.

After the first four days of treatment, the questionnaire was turned over to a researcher, who then interviewed the participant and completed the questionnaire based on the participant’s responses to questions about general changes in nausea and vomiting, method of capsule use, and adherence to the dietary recommendations. This information was recorded on a fifth page added to the questionnaire.

Data were analyzed with a sign test to assess ginger and placebo effects on nausea intensity in each group at different times of follow-up. The Mann-Whitney test was used to compare the between-groups effect. Effects of placebo and ginger on vomiting times was also tested by the paired t-test for comparing before-and-after variations within the groups and by the t-test for comparing variations between the experimental and placebo groups. The Confidence Interval (CI) was 95% for all data analyses.

Results

The data for 67 of the 70 women were analyzed (3 participants assigned to the experimental group were excluded because they failed to complete the after-treatment questionnaire. This left 32 women in the experimental (ginger) group and 35 women in the control (placebo) group). Matching of the participants in terms of age, gestational age, and parity did not reveal significant differences between the two groups. Table 1 compares the gestational age of the two study groups.

Participants in both groups, experimental and control, used 4 ± 0 capsules (mean ± SD) daily during the treatment period. They were asked not to use any other nonprescription item during the four days of the intervention, and nobody used such items. Participants were also asked to ingest the capsules 4 times a day (morning, noon, afternoon, and night) for 4 days. Water was recommended to help them swallow the capsules.

Some 54% of subjects in the control group and 44% of subjects in the experimental group either did not pay attention to the dietary recommendations or only roughly followed them. However, the difference between the two groups in this regard was not significant (chi square, p > 0.05).

Nausea intensity was reported as moderate in 54% of the control sample and 56% of the experimental sample; mild in

<table>
<thead>
<tr>
<th>Gestational age (weeks)</th>
<th>Control (n = 35)</th>
<th>Experimental (n = 32)</th>
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<tbody>
<tr>
<td>8–10</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>11–13</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>14–16</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>17–19</td>
<td>6</td>
<td>5</td>
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</tbody>
</table>
25.7% of the control sample and 18.7% of the experimental sample, and severe in 7% of the control sample and 8% of the experimental sample. None of these differences were statistically significant (chi square, p > 0.05).

The eight assessments of nausea intensity recorded by each participant (2 measurements a day for 4 days) showed that improvement in the experimental group was significantly greater than in the control group (Mann-Whitney test, p < 0.05). As Table 2 shows, after treatment, 26% of ginger capsule users had no nausea intensity, whereas this effect was reported by only 10% of the control group. Nausea was reported as severe in 9% of women in the experimental group and 17% of women in control group, also significantly different (t-test, p < 0.05). Overall, after treatment, nausea became milder among women in the experimental group than those in the control group.

It should be pointed out that after-treatment nausea intensity measurements, which was assessed 8 times for each participant (2 daily measurement for 4 days), totalled 280 (35 × 8) assessments for the placebo group and 256 (32 × 8) for the experimental group. This difference may have skewed the statistical analysis.

Nausea intensity improved significantly in 84% of ginger users versus 56% of the women in the control group (Mann-Whitney test, p < 0.05). There was not any change in nausea intensity for 21.5% of the women in the control group and 9% of those in the experimental group.

Women in the control group reported vomiting 1.1 ± 1.4 times during the 24 hours before treatment, whereas the experimental group reported vomiting 1.6 ± 1.9 times during the same period; the difference was not significantly different. However, the incidence of vomiting after treatment showed a 9% decrease in the control group, which was not significantly different, and 50% decrease in the experimental group, which was significantly different (paired t-test, p < 0.05). In addition, the difference between the two groups was statistically significant (t-test, p < 0.05). Finally, it is important to note that none of the participants reported any complications during the treatment period.

**Discussion**

This research demonstrated that use of ginger capsules led to a decrease in nausea intensity and vomiting incidence in pregnancy. It also showed that the women who used the capsules were satisfied with their effect. These results are consistent with an earlier study by Fischer-Rasmussen et al., who demonstrated a significant decrease in nausea and vomiting signs in a two-day treatment period. The results also confirm the findings of Vutyanich et al., who showed a significant decrease in nausea and vomiting intensity after a similar study (250 mg ginger capsules 4 times daily for a total of 1 g daily for 4 days). Their results demonstrated that ginger decreases the intensity of nausea and vomiting significantly. Neither of these previous studies reported any recommendations to the women about their eating behavior. However, they did state that ginger is mentioned in old texts of India, China, Ancient Rome, Greece, and Arabia. Ginger root is widely used in flavoring breads, sweets, jams, and drinks, and for its aroma. It is also known as a valuable herbal drug. Through thousands of years of Asian medicine, dehydrated ginger has been used as a medicine for problems of the digestive system, such as diarrhea, gastritis, and nausea. It is commonly used for nausea and vomiting of pregnancy in Chinese and Thai traditional medicine, and it is also listed for that purpose in the U.K. pharmacopoeia.

We showed that a safe 4-day treatment with 1000 mg of ginger daily improved the signs of nausea and vomiting in pregnant women, without any side-effects. Doses ranging from 1000 to 1500 mg ginger have been used during pregnancy, but we suggest a safe dose of 1000 mg daily as proposed by Mazzota et al. and Hollyer et al. for the treatment of pregnancy-related nausea and vomiting. Because the daily dose of 1000 mg is known to be safe and effective, it seems to be a better choice than the higher dosage reported (1500 mg/day). It is also of interest that the components of ginger responsible for its medicinal value—gingetol and shogaol—have only local effects on the gastrointestinal system, whereas many pharmaceutical anti-nausea agents have effects on the central nervous system.

Ginger has been also prescribed in syrup form. In a study in the State of Florida, Keating and Chez showed a significant decrease in first trimester nausea and vomiting after 250 mg of ginger syrup in a beverage 4 times per day. The control group used honey, water, and lemonade. After a few days, the women taking the ginger syrup noticed a significant improvement in nausea intensity (77% versus 20% in the control group), as well as a reduction in the incidence of vomiting (67% versus 20% in the control group). In our study participants were all satisfied with the capsule form of ginger and there were no reports of side-effects. It would seem that either form of delivery, capsules or syrup, would be appropriate. Offering a choice would likely appeal to women who tend to herbal remedies and seek to improve the nausea and vomiting associated with their pregnancy.

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**Table 2. Comparison between Frequencies and Different Intensities of Nausea during Pregnancy—Effects of Ginger or Placebo Use**

<table>
<thead>
<tr>
<th>Treatment group</th>
<th>Without nausea</th>
<th>Mild nausea</th>
<th>Moderate nausea</th>
<th>Severe nausea</th>
<th>Total frequency</th>
<th>Chi square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (placebo)</td>
<td>28 (10)</td>
<td>72 (26)</td>
<td>138 (49)</td>
<td>47 (15)</td>
<td>280 (100)</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Experimental (Ginger)</td>
<td>71 (28)</td>
<td>97 (38)</td>
<td>65 (25)</td>
<td>23 (9)</td>
<td>256 (100)</td>
<td></td>
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*Note: After treatment, nausea intensity was assessed 8 times for each participant (2 daily measurements for 4 days). Thus, total number of assessments for the placebo group was 35 × 6 = 280 and for the ginger group was 32 × 5 = 256.*
One of the limitations of our study was the short assessment period. We only assessed the groups for one week, and thereafter, we were not able to compare or judge the intensity of nausea and vomiting between two groups.

The results of our study suggests that 1000 mg of ginger per day (250 mg capsules 4 times daily) can be used as a safe remedy to improve the nausea and vomiting of pregnancy. Gastrointestinal upset is the most common complaint of pregnancy, and because of the side-effects of the anti-nausea drugs, ginger capsules can be suggested by all maternal care providers as a safe and effective means of controlling these symptoms. The results of this study indicate that further research into the effects of ginger on severe continuous and resistant nausea and vomiting of pregnancy is warranted.

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References


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