



A Literature Review of the Effectiveness of Ginger in Alleviating Mild-to-Moderate Nausea and Vomiting of Pregnancy

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Mild-to-moderate nausea and vomiting of pregnancy affects up to 80% of all pregnancies. Concern about antiemetic use and the time-limited nature of symptoms has restrained the development of effective treatment approaches, yet supportive, dietary, and lifestyle changes may be ineffective. This article reviews 4 recent well-controlled, double-blind, randomized clinical studies that provide convincing evidence for the effectiveness of ginger in treating nausea and vomiting of pregnancy. It also provides a dosage update for the various forms of ginger. *J Midwifery Womens Health* 2005;50:e1–e3 © 2005 by the American College of Nurse-Midwives.

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INTRODUCTION

Many practitioners support the use of herbal remedies when treating mild symptoms of pregnancy, yet they often lack useful clinical information about particular herbs, dosages, and effectiveness. This article reviews the latest research on ginger for the treatment of mild-to-moderate nausea and vomiting of pregnancy and provides a dosage update for the various forms of ginger.

Mild-to-moderate nausea and/or vomiting affects up to 80% of all pregnant women,^{1,2} usually peaking by week 9 and subsiding by week 20. For 9% to 20% of women, nausea and vomiting of pregnancy persist longer,^{1,3} and symptoms are comparable in severity to the nausea and vomiting associated with cancer chemotherapy,² with the concomitant negative effect on work and personal life.

Nausea and vomiting are complex responses involving various neural pathways and motor responses to sensory stimuli. Nausea and vomiting can occur independently, but both involve a central nervous system (CNS) response using the same neural pathways to and from the area postrema and chemoreceptor trigger zone in the medulla oblongata. Once activated, regardless of trigger, the gastrointestinal response, which includes hypotonicity, hypoperistalsis, hyposecretion, decreased small intestinal motility, and ejection of stomach and small intestine contents often follows.⁴ The neurotransmitters thought to be involved are cholinergic and serotonin agonists.⁵

The lack of consensus about etiology has hampered development of pharmacologic treatments. Health care providers are reluctant to prescribe antiemetics for mild-to-moderate nausea and vomiting of pregnancy because symptoms are

self-limiting, and because potential teratogenic effects of medications are of concern.

Thus, traditional treatments have been supportive, dietary, and lifestyle changes, which at best mitigate, but do not eliminate, symptoms. As a result, both pregnant women and clinicians are turning to complementary and alternative medicine in search of relief.⁶

GINGER FOR TREATMENT OF NAUSEA AND VOMITING

Ginger rhizome (*zingiber officinale*), used worldwide as a spice and an herbal remedy, has a long history as a digestive aid and antinausea remedy. It is the herb most commonly used to treat nausea and vomiting of pregnancy, either recommended by providers or used as self-treatment by women.⁷ The pharmacologic activity is thought to lie in the pungent principles (gingerols and shogaols) and volatile oils (sesquiterpenes and monoterpenes).⁸

The exact mechanism of action of ginger is thought to be a gastric effect, to increase tone and peristalsis due to anticholinergic and antiserotonin action.^{9–13} Ginger acts directly on the digestive tract and avoids the CNS side effects common to centrally acting antiemetics. **Table 1** presents dosage and form equivalents for commonly used forms of ginger.^{14,15} Ginger is available in capsule or syrup form or in candy, cookies, beer, tinctures, teas, sodas, and jam. Currently, exact dosing is available only if one uses standardized extracts; however, women may choose to use another form of ginger.

LITERATURE REVIEW

Four recent well-controlled, double-blind, randomized clinical studies have been published, which provide convincing evidence for the effectiveness of ginger in treating nausea and vomiting during pregnancy.^{16–19} These studies used a

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Table 1. Dosage Information for Various Forms of Ginger^{14,15*}

1000 mg standardized extract [†] =	1 teaspoon fresh grated rhizome
	2 droppers liquid extract (2 mL)
	2 teaspoons syrup (10 mL)
	4 cups (8 oz each) ginger tea prepackaged
	4 cups (8 oz each) ginger tea, steeping 1/2 teaspoon grated ginger for 5–10 min
	8-oz cup ginger ale, made with real ginger
	2 pieces crystallized ginger, each 1 inch square, 1/4 inch thick

*Because formulations vary, check labels for mg ginger per dose/serving, and adjust accordingly to reach 1000 mg ginger/day.

[†]Powdered, encapsulated ginger to be taken in 2–4 divided doses daily.

daily 1-g dose in capsule or syrup form, for 4 days to 3 weeks, with no adverse outcomes or side effects.

Fischer-Rasmussen and colleagues¹⁶ conducted a double-blind, randomized, crossover study to compare the efficacy of ginger versus placebo in treating hyperemesis gravidarum in 30 hospitalized women less than 20 weeks gestational age. Participants received either 1-g ginger or placebo every day for 4 days, followed by a 2-day washout before crossover. No other antiemetic preparations were given, but parenteral support was allowed. There was a significant preference for ginger (70%) versus placebo (15%). Symptoms were assessed the day after each treatment period ended, and relief was significant for ginger ($P = .035$), with a mean relief score of 3.7 to 4.1 for ginger versus -0.1 to 0.9 for placebo. The main differences in relief reported were a reduced incidence of vomiting and decreased nausea. The crossover design controlled for the expected reduction in symptoms with longer gestation.

Vutayavanich et al¹⁷ conducted a double-blind, randomized study to examine the effects of ginger on mild-to-moderate nausea and vomiting of pregnancy. Seventy outpatient women received either 1-g ginger or placebo daily for 4 days. The severity of nausea was recorded twice per day, and the number of vomiting episodes over the previous 24 hours was recorded once daily. Again, changes in nausea scores in the ginger group (2.1 ± 1.9) were greater than in the placebo group (0.9 ± 2.2), with $P = .014$. By the fourth treatment day, a greater reduction in vomiting episodes occurred in the ginger group than in the placebo group (38% versus 66% had episodes of vomiting in respective groups), and symptoms improved in 88% of the ginger group but only 29% of the placebo group ($P = .001$).

Keating and Chez¹⁸ conducted a double-blind, randomized study to examine the acceptance and effectiveness of ginger syrup for nausea and vomiting of pregnancy in 26 outpatient

women between 7 and 11 weeks' gestational age. They self-administered either 1 tablespoon ginger syrup (containing 250-mg ginger) or placebo flavored with lemon oil, mixed with 4 to 8 ounces hot or cold water up to 4 times/day for 2 weeks. Women kept a daily diary, and recorded the number of doses taken and number of vomiting episodes each day. They also rated level of nausea on a 1 to 10 scale. By the sixth day, 67% of the ginger group and 20% of the placebo group who were vomiting daily at the beginning of the study had stopped; by the ninth day, nausea had improved by at least 4 points in 77% of the ginger group and only 20% of the placebo group.

Most recently, Smith and colleagues¹⁹ conducted a randomized controlled equivalence trial to compare the effectiveness of ginger versus vitamin B6 in treating nausea and vomiting in 291 outpatient women less than 16 weeks' gestational age. The women self-administered 350-mg ginger or 25-mg B6 3 times a day for 3 weeks and used a Rhodes scale to report changes in nausea, vomiting, and dry retching at the end of each week of the study. Ginger was found to be equivalent to vitamin B6 in reducing nausea (mean difference 0.2), dry retching (mean difference 0.3), and vomiting (mean difference 0.5). There was no difference in pregnancy outcomes between study groups.

DISCUSSION

In all 4 studies reviewed here, no rationale was offered for the choice of dose and length of treatment. As with all herbal, prescription, and over-the-counter medications, it is important to know the maximum safe dose and length of treatment with the fewest side effects, the consequences of overdose, and potential drug/herb interactions. In no study was the safety of ginger consumption during pregnancy explicitly addressed, nor was any study powered well enough to get statistically significant results concerning safety. The studies were time-limited, yet nausea and vomiting of pregnancy can last for weeks. Animal studies have reported both mutagenic and antimutagenic effects of isolated components of ginger,^{20–22} and human studies have conflicting results regarding potential inhibition of platelet aggregation when ginger is consumed at high doses.^{23,24} One recent study examined pregnancy outcomes in 187 women known to have consumed ginger during the first trimester and found no statistically significant difference in major malformations, spontaneous abortion, and stillbirth rates between the ginger and the comparison group.²⁵

In summary, ginger is a safe and effective treatment option for nausea and vomiting of pregnancy and comparable with vitamin B6 in effectiveness. Future research needs to address potential risks from high doses during pregnancy, but ginger has a long history of safety, because it has been used for centuries for medicinal purposes as well as a food substance and spice. The FDA classifies ginger as “Generally Recognized as Safe,” and the German Commission E monographs

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report no known side effects and no known drug/herb interactions.²⁶

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