



# ANTIEMETIC PROPERTIES OF GINGER

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## INTRODUCTION

**G**inger, also identified by its Latin name *zingiber officinale*, has been known for over 5,000 years to have medicinal properties in addition to providing a unique spicy flavor to various foods.

According to one online alternative medical publication, ginger was once considered the “universal medicine,” because it was thought to have multiple uses.<sup>1</sup>

Medicinal ginger is made by grinding the rhizome (root portion) of the plant into powder. The powder is then weighed and placed into a capsule or dissolved in syrup for ingestion.

Ginger is thought to be effective in reducing the frequency of nausea and vomiting related to several conditions, including general anesthesia, pregnancy, chemotherapy and motion sickness.

Descriptions and results of five studies involving the use of ginger will be presented in this article. The first three studies relate to pregnancy, the fourth study relates to chemotherapy, and the fifth study relates to motion sickness.

## GINGER SYRUP AS AN ANTIEMETIC IN EARLY PREGNANCY

A double-blind, placebo-controlled, randomized clinical trial was implemented to determine if ginger syrup was effective in the relief of nausea and vomiting frequency (rated on a 10-point scale) related to the pregnancy. The study was performed in a University of South Florida department of obstetrics and gynecology private practice office.

Twenty-six subjects, all in the first trimester of pregnancy, were suffering daily from nausea and vomiting related to the pregnancy. Each subject was given one tablespoon of ginger syrup or a placebo in four to eight ounces of water, four times per day for a total of one gram of ginger per day.<sup>3</sup>

Descriptive one-way analysis of variance (ANOVA) statistics were used to describe the data. Eight of the 13 (62%) subjects taking ginger reported that the vomiting had stopped completely by day six, and 10 (77%) subjects reported a four-point or greater improvement on the nausea scale by the ninth day.

Two of the 10 (20%) remaining subjects taking the placebo had stopped vomiting completely by day six, two (20%) reported a four-point or greater improvement on the nausea scale, and two had stopped vomiting completely.<sup>3</sup>

#### TREATING NAUSEA AND VOMITING IN PREGNANCY

A randomized, controlled equivalence trial was implemented to determine whether ginger was as effective in the relief of nausea and vomiting frequency (rated on a five-point scale) related to pregnancy as pyridoxine hydrochloride (vitamin B<sub>6</sub>).

The study was performed at a teaching hospital in Adelaide, Australia. Two hundred ninety-one subjects, all in the first 16 weeks of pregnancy,

were suffering daily from nausea and vomiting related to the pregnancy. Each subject was given 350 milligrams of ginger or 25 milligrams of vitamin B<sub>6</sub>, three times per day for three weeks.<sup>5</sup>

Descriptive one-way ANOVA statistics were used to describe the data. On day one, 99% of subjects in both groups reported nausea and vomiting.

On day seven, 89% of the ginger subjects and 85% of the vitamin B<sub>6</sub> subjects reported nausea and vomiting. On day 14, 86% of the ginger subjects and 81% of the vitamin B<sub>6</sub> subjects reported nausea and vomiting.

On day 21, 82% of the ginger subjects and 79% of the vitamin B<sub>6</sub> subjects reported nausea and vomiting.<sup>5</sup>

#### USING GINGER ROOT TO DECREASE SEVERITY OF NAUSEA AND VOMITING IN EARLY PREGNANCY

A randomized, double-masked, placebo controlled trial was implemented to determine if ginger was effective in the relief of nausea and vomiting frequency (rated on a five-point scale) related to pregnancy.

The study was performed at an antenatal clinic in Thailand. Seventy subjects, all in the first 17 weeks of pregnancy, were suffering daily from nausea and vomiting related to the pregnancy.

#### The roots of ginger



Ginger is a tropical plant that thrives in moist soil. Its edible, underground stem is called the rhizome. The stem extends approximately one foot above ground with white or green flowers at the tip.

The ginger plant is indigenous to southern China. From there, it spread to the Spice Islands, the rest of Asia, and ultimately, West Africa and the Caribbean. Today, India is the primary producer and exporter of ginger.<sup>2</sup>

Ginger has been used as a cooking spice for more than 4,400 years.

Each subject was given 250 milligrams of ginger or a placebo before each meal and at bedtime for a total of one gram of ginger per day for four days.<sup>8</sup>

Descriptive one-way ANOVA statistics were used to describe the data. All subjects (100%) reported nausea and vomiting on the first day. On the fourth day, 37.5% of the ginger group and 65.7% of the placebo group reported nausea and vomiting.

Although the study was of short duration, inferential statistics show that the ginger was twice as effective in reducing the frequency of nausea and vomiting than the placebo.<sup>8</sup>

#### GINGER AS AN ANTIEMETIC IN NAUSEA AND VOMITING INDUCED BY CHEMOTHERAPY

A randomized, prospective, cross-over, double-blind study was performed to determine if powdered ginger root was as effective as two other antiemetics (metoclopramide or ondansetron) in the relief of nausea and vomiting frequency induced by the chemotherapeutic drug cyclophosphamide.

The study was performed at a government medical college and hospital in Nagpur, India. Sixty subjects, taking the drug cyclophosphamide, had suffered from nausea and vomiting in a previous round of chemotherapy. In addition to the chemotherapeutic agent, each subject was given either one gram of ginger powder orally, 10 milligrams of metoclopramide intravenously (IV), or four milligrams of ondansetron intravenously 20 minutes prior to the chemotherapy treatment and again six hours after the treatment.<sup>6</sup>

Descriptive one-way ANOVA statistics were used to describe the data. Complete control of nausea was achieved in 62% of the subjects taking ginger, 58% of the subjects taking metoclopramide, and 86% of the subjects taking ondansetron.

Complete control of vomiting was achieved in 68% of the subjects taking ginger, 64% of the subjects taking metoclopramide, and 86% of the subjects taking ondansetron.

Analysis among the groups showed that the subjects in the ondansetron group showed a statis-

Common name	Medicinal properties
Allspice	Antiemetic, purgative
Anise seed	Antispasmodic, expectorant, sedative
Basil	Used for colds, antidiarrheal, kidney disease
Bergamot	Antiseptic, antispasmodic, sedative
Camphor	Antiseptic, cardiostimulant, antispasmodic
Caraway	Diuretic, antispasmodic, galactagogue
Cardamom	Antiseptic
Chocolate	Sedative, antioxidant, diuretic
Cilantro	Antibacterial, anti-inflammatory
Cinnamon	Antiseptic, Antidiarrheal
Clove	Topical anesthetic, used for dyspepsia
Coriander	Antispasmodic, anti-inflammatory, diuretic
Cumin	Antimicrobial, diuretic
Curry leaves	Antiemetic
Dill	Antiflatulent, galactagogue
Galangal	Expectorant, antibacterial
Garlic	Antimicrobial, antihypercholesterolemic, antihypertensive
Horseradish	Antimicrobial, expectorant, purgative
Marjoram	Used for indigestion and colic
Mint	Expectorant, local anesthesia, used for colds
Nutmeg, mace	Astringent, hallucinogen
Peppercorns	Expectorant, antimicrobial
Quinine (tonic water)	Antiarrhythmic, febrifuge, astringent
Saffron	Antirheumatic, used for neuralgia
Sage	Antiseptic, gastroenteritis, sedative
Turmeric	Antiartritic, antioxidant
Wasabi	Expectorant, used for sinusitis

tically significant (almost 25%) improvement over the subjects taking ginger and metoclopramide.<sup>6</sup>

#### EFFECTS OF GINGER ON MOTION SICKNESS SUSCEPTIBILITY AND GASTRIC FUNCTION

A voluntary, placebo-controlled study was carried out to determine if ginger root was as effective as scopolamine in the relief of nausea related to motion sickness. The study also assessed gastric function; however, those results will not be presented in this report.

## The benefits of ginger



Ginger has been used since ancient times in Asian, Arabic and Indian medicine. The herb has been used in China for more than 2,000 years to treat diarrhea, stomach pain and nausea. Other historical uses of ginger include treatments for arthritis, colic and heart conditions.

Today, ginger often appears as an ingredient in digestive, laxative, antifatulent, antacid and antitussive dietary supplements.

Although modern scientific evidence is inconclusive, ginger has a long history of being used to treat a wide variety of medical conditions, including:

- Alcohol withdrawal
- Atherosclerosis
- Athlete's foot
- Baldness
- Bronchitis
- Burns
- Cancer
- Cholera
- Colds
- Colic
- Depression
- Diarrhea
- High blood pressure
- Impotence
- Intestinal parasites
- Liver disease
- Migraines
- Psoriasis
- Snake bites
- Toothaches
- Ulcers

Ginger has also been used historically as an:

- Antacid
- Antifungal
- Antioxidant
- Antiseptic
- Antiviral
- Aphrodisiac
- Blood thinner

The study was performed at Louisiana State University Medical Center in Shreveport, Louisiana. Twenty-eight subjects made timed head movements by rotating in a chair to the endpoint of nausea (without vomiting). Each subject was given either 500 milligrams of ginger or 0.6 milligrams of scopolamine and a placebo.<sup>7</sup>

Descriptive one-way ANOVA statistics were used to describe the data. Anti-motion sickness effectiveness was judged by an increase in head movements compared to placebo control.

No increase in head movements was noted in the subjects given ginger as compared to the placebo. However, an average increase of 147.5 head movements was noted in the scopolamine group.<sup>7</sup>

### ANALYSIS OF RESULTS

All of the studies presented in the literature review were experimental prospective trials. Ginger, along with a placebo or a prescription antiemetic and a placebo, was used as a possible antiemetic in all five studies.

Neither the researchers nor the patients knew which medication(s) was being used at any given time. The first three studies were conducted under very similar circumstances. All of the subjects were in the early stages of pregnancy and were complaining of nausea and vomiting related to the pregnancy.

The fourth study involved patients taking the chemotherapy drug cyclophosphamide, and the fifth study was related to motion sickness.

One-way ANOVA studies were utilized for comparison in each of the studies reported. Ginger was shown to be effective in reducing the frequency of nausea and vomiting related to pregnancy in the first three studies.

Ginger was also shown to be effective in reducing the frequency of nausea and vomiting related to the use of the chemotherapeutic agent cyclophosphamide in the fourth study. Unfortunately, in the fifth study, ginger was not shown to be effective in reducing the frequency of nausea related to motion sickness.

## CONCLUSION

Ginger appears to be an effective natural alternative to prescription medications for reducing the frequency of nausea and vomiting related to pregnancy and chemotherapy. The one study related to motion sickness showed that ginger was ineffective as an antiemetic in this situation—possibly because the causative mechanism of nausea related to motion sickness differs from the physiological origin of nausea related to pregnancy and chemotherapy.

However, the effectiveness of ginger in treating nausea and vomiting related to motion sickness should not be ruled out based on the results of one study. Ginger may prove useful in the postanesthesia care unit for treatment of postoperative nausea and vomiting. More testing of ginger as an antiemetic is warranted.

## ABOUT THE AUTHOR

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## Edible and ornamental ginger

The name of edible ginger—*Zingiber officinale*—comes from the Sanskrit word that means “horn root.” It may be listed by different names, such as African ginger, black ginger or Jamaican ginger. Edible ginger is just one of more than 1,000 species of tropical plants in the *Zingiberaceae* family. These ornamental plants are popular among gardeners for their colorful foliage and exotic, scented flowers.



Clockwise from left: © iStockphoto.com/VFK, Narasha Japp, Brent Wong, ghamets.