

Peppermint Oil

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Introduction

Peppermint has been used since antiquity to treat a variety conditions, including gastrointestinal (GI) disorders, common cold and respiratory conditions, muscle pain, headaches, and neuralgia. (1)

Definition and Description

Peppermint or *Mentha piperita* is a common herb grown in Europe and North America. (1) The plant contains about 1.5% essential oil, which consists of menthol, the primary active species. (1) Menthol is the primary component of the essential oil of peppermint (29% to 48%) and is mostly responsible for the agent's spasmolytic effects. (1)

Peppermint oil often is used in pediatric patients for recurrent abdominal pain, irritable bowel syndrome (IBS), nausea, and symptomatic relief of coughs and colds. (1) Peppermint also has been used for aromatherapy to treat nausea and vomiting and topically for relief of minor muscular pain and neuralgias. (1)(2)

Pharmacologic Action

Current evidence suggests that peppermint oil reduces smooth muscle contractions through a calcium channel blocking effect; the blocking effect is believed to be carried out by the menthol component of the oil. (3)(4) This results in an antispasmodic effect on the smooth muscles of the GI tract. (5) Peppermint relaxes GI smooth muscle by reducing cellular calcium influx in the intestines. (6)(7) Menthol also stimulates bile flow, reduces the tone in the esophageal sphincter, facilitates belching, and acts as a carminative and antibacterial agent. (8)(9)(10)

Evidence of Efficacy

Most clinical studies have investigated the actions of enteric-coated capsules of peppermint oil in the treatment of GI disorders. Efficacy outcomes of peppermint oil in adults who had IBS have varied. (11)(12)(13)(14)(15)(16) A meta-analysis concluded that the "role of peppermint oil in IBS has not been established beyond a reasonable doubt." (12)

A review by Grigoleit and Grigoleit (17) involving the use of peppermint to treat IBS found that peppermint oil reduced symptoms by an average of 58% versus 29% for the placebo group. The authors suggested that peppermint oil is equally efficacious to standard treatment of IBS with anticholinergics. However, the methods for this review were not clearly reported, and there was significant heterogeneity in the included trials. Another systematic review by Pittler and Ernst (12) found a significant improvement in symptoms for patients who had IBS, with an odds ratio of 7.5 ($P<0.001$). However, based on the evidence evaluated, other authors could not conclude definitively whether peppermint oil truly reduces symptoms. (18) Other reviews of studies conducted in adults have reached equivocal results. (19)

A randomized, placebo-controlled trial of enteric-coated peppermint oil capsules (1 to 2 capsules TID, depending on the weight of the child) in 50 children 8 years of age and older who had IBS documented a statistically significant improvement in GI symptoms, such as pain, compared with placebo within 2 weeks of treatment. (3) A total of 76% of the patients receiving peppermint oil reported changes in the severity of symptoms compared

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with 19% receiving placebo. There were no changes in abdominal rumbling, abdominal distention, belching, gas, or heartburn. (3)

Preliminary investigations have examined the role of peppermint in improving behavior in children who have attention-deficit/hyperactivity disorder and preventing postoperative nausea and vomiting. (20)(21) There is not enough definitive evidence at this time to support the use of peppermint oil in these conditions.

Adverse Events

The most common adverse effects associated with peppermint use are heartburn, perianal burning, hypersensitivity, rash, abdominal pain, bradycardia, and muscle tremor. (1)(4)(17) Peppermint is known to reduce lower esophageal pressure, which is the most likely cause of the heartburn symptoms. When used topically, peppermint oil can cause local skin reactions such as dermatitis. (4)

Menthol can cause jaundice in newborns, particularly in infants who have glucose-6-phosphate dehydrogenase deficiency. (22)(23)

Drug Interactions

Enteric-coated peppermint oil should not be used when the stomach is not producing hydrochloric acid because increases in gastric pH may cause premature dissolution of the enteric coating. (24) Drugs that decrease stomach acid and raise gastric pH include antacids, histamine-2 receptor blockers, and proton pump inhibitors. Peppermint oil generally slows absorption in healthy volunteers and may slow the absorption rate of concomitantly administered drugs. (25)

Although peppermint has been observed to inhibit cytochrome P450 isoenzyme 3A4 and has calcium channel blocking effects, there are no clinical reports of drug interactions with peppermint oil. (4)

Precautions/Contraindications

Peppermint oil should be avoided in patients who have gastroesophageal reflux disease, hiatal hernias, or dyspepsia because it can reduce lower esophageal sphincter pressure, which may worsen GI reflux symptoms. (4)(25) Use of peppermint oil is contraindicated in cases of biliary duct occlusion, gallbladder inflammation, and clinical liver disease. (26)(27) It should be used cautiously in inflamed or ulcerated conditions of the GI tract. (25)

The oil should not be applied directly to the nasal areas or chests of infants because of the risk of apnea, bronchospasm, and respiratory depression. (1)

Use in Pregnancy and Lactation

Enough evidence is not available to support the efficacy or safety of peppermint oil in pregnancy and lactation. (4) Peppermint oil has been used for the treatment of nausea and vomiting in pregnant women, although little safety evidence is available. (28)(29)

Administration/Dosage Forms

Peppermint oil is available in enteric-coated capsules, teas, suspensions, inhalation solutions, lozenges, and topical rubs. (1) Enteric-coated capsules resist degradation and release of the oil in the stomach; more oil is released when the capsule reaches the intestine, the site of action for IBS. (3)

No standardized dosages are available. One suggested oral regimen for the use of peppermint oil in children who have IBS is 0.1 to 0.2 mL tid for 2 weeks. (4) Some products specifically are not recommended for use in children younger than 15 years of age without a prescription from a physician. Some recommend using three to four drops in water as an inhalation, but there are no specific dosages for children via this route. (1)

Conclusion

Peppermint oil has been studied in the treatment of a variety of GI complaints in children. Available evidence is limited in terms of study design and outcomes, but there are some promising results. Safety concerns are few, with an uncertainty about adverse effects for patients who have liver disease. Rash and dermatitis are reported most commonly with topical use, and heartburn is reported most commonly with oral use.

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