Peppermint and the gut

AVNI SALI MBBS, PhD, FACS, FRACS, FACNEM

LUIS VITETTA PhD, GradDip, IntgrMed, GradDip, Nutr/EnvironMed

There is growing evidence to suggest that enteric-coated peppermint oil capsules are effective in treating symptoms of irritable bowel syndrome.

PHOTOLIBRARY

The use of herbal products for medical conditions is increasing. Medicinal uses are generally based on traditional uses of herbs, usually culinary, but research is now providing some evidence of effectiveness for these uses and others. Peppermint is one example of such a herb.

Peppermint (*Mentha x piperita*) is a member of the mint family, and its use as a medicine was first described in 1696.[1] It has been used as an antispasmodic, an antiseptic and an aromatic in traditional medicine in the Eastern and Western worlds. It has been used to treat indigestion, nausea, sore throats, colds, toothaches, cramps and cancers. The menthol component of peppermint oil is used as an inhalant for upper respiratory tract disorders, and is an ingredient in many liniments and ointments for sore muscles. The traditional use of peppermint for digestive disorders is thought to be the key reason for its use as after dinner mints.

Peppermint for medicinal uses is usually in the form of an oil. The chemistry of peppermint oil is complex as more than 100 components have been identified. The relative concentrations of these components depend on climate, cultivars and geographic location.[1] The main components are menthol (29 to 48%) and menthone (20 to 31%) and it also contains various flavonoids, which contribute to its overall activity as an antioxidant. Peppermint oil is available as the oil and enteric-coated capsules (Mintec), and also as a component of other gut medications and various nasopharyngeal medications.

Gut-related effects of peppermint oil

Peppermint oil is widely used for digestive disorders and its gut-related effects are discussed below. It also has a number of other actions including stimulant, coolant, antiallergy, antiviral, sedative, diuretic and analgesic effects.

Gastrointestinal effects

The spasmolytic effect of peppermint oil has been demonstrated on the smooth muscle of the digestive tract in humans. *In vitro* experiments carried out on isolated small and large animal intestinal preparations have shown an antispasmodic effect. These antispasmodic effects are caused by interactions of peppermint oil with smooth muscle calcium channels.[2]

Intravenous administration of an aqueous solution of peppermint oil reduces morphine-induced spasm of the sphincter of Oddi ganglia in guinea pigs.[3,4] Intra-oesophageal pressure is reduced when healthy humans are given 180 mg of peppermint oil.[5] Relaxation of the gastro-oesophageal junction also occurs and this can lead to gastro-oesophageal reflux.

Intraluminal administration of peppermint oil into the large bowel of humans can produce varying effects depending on the concentration of the oil. Concentrated peppermint oil can produce bowel spasm, whereas more diluted oil injected through the biopsy channel of a colonoscope relieves bowel spasm.[3,6]

Choleretic activities

The flavonoids in peppermint oil have choleretic effects in dogs and rats.[1] Peppermint oil can relax the gallbladder, as well as slow small intestinal transit in humans.[2] However, no significant changes in gastric emptying have been observed. Menthol given with ursodeoxycholic acid to humans can significantly reduce the size of gallstones by dissolution, as well as reduce the incidence of stone calcification.[3]

Effects on liver metabolism

Peppermint oil can inhibit 3-hydroxy-3-methylglutaryl coenzyme A reductase activity in rats by 70% and, therefore, might have a role in the treatment of serum lipid disorders in humans.[3]

Antibacterial activities

In vitro, peppermint oil possesses antibacterial activity on numerous bacteria including *Helicobacter pylori, Escherichia coli, Salmonella enteritis* and *Shigella sonnei*.[2] Unfortunately there are no clinical studies investigating the antibacterial activity of peppermint oil.

Professor Sali is Director, National Institute of Integrative Medicine, Richmond, Melbourne, Vic. Dr Vitetta is Associate Professor of School of Medicine and Principal Research Fellow, Unit of Health Integration, University of Queensland, Brisbane, Qld.

Clinical uses of peppermint oil

Traditionally, peppermint has been used to treat flatulence, abdominal pain (including dyspepsia and colicky pain), nausea and vomiting, and morning sickness.

Clinical studies support the use of peppermint oil for irritable bowel syndrome (IBS), dyspepsia (nonulcer), diffuse oesophageal spasm and postoperative nausea.

The use of peppermint oil for respiratory disorders and dementia is outside the scope of this article.

Irritable bowel syndrome

IBS is one of the most common gastrointestinal disorders. The pathophysiology of IBS is not completely understood but a motility disorder of the digestive tract appears to be the key feature. Stress and depression play an important role, as do intestinal flora and food intolerance.

Clinical studies have investigated the role of peppermint oil in the treatment of IBS. A systematic review and meta-analysis of randomised clinical trials has revealed that peppermint oil alleviated symptoms in patients with IBS significantly more than did placebo.[7] A number of these trials, however, had methological flaws.

Recent studies have used enteric-coated peppermint oil capsules because this form of peppermint can deliver the oil at high concentrations to the intestine. Enteric coating is also more likely to prevent relaxation of the gastro-oesophageal junction.

A large prospective, randomised, double-blind, placebo–controlled study in 110 patients with IBS using enteric-coated peppermint oil capsules decreased abdominal pain by 79% (29 were pain free). Furthermore, 83% had a more regular bowel habit, 83% had less abdominal distension, 73% had fewer borborygmi and 79% less flatulence.[8]

In a randomised, double-blind controlled trial in children with IBS, enteric-coated peppermint oil reduced the severity of abdominal pain by 75%.[9]

Intestinal flora are likely to play a role in patients with IBS. Two single case reports using enteric-coated peppermint oil in individuals with IBS and small intestinal overgrowth showed an improvement in pain with no effect on other symptoms including abdominal distension and flatulence.[10,11] It is possible that the antibacterial action of peppermint oil was a factor in this response.

The suggested dose of enteric-coated peppermint oil capsules for patients with IBS is one capsule (0.2 mL) three times daily, 15 to 30 minutes before meals.

Dyspepsia (nonulcer)

Patients with upper abdominal discomfort following meals (with or without nausea and vomiting) and known not to have any other gastrointestinal abnormality on routine investigation can have a slower rate of gastric emptying. A study investigating patients with delayed gastric emptying found that peppermint oil (0.2 mL in 25 mL of water) improved gastric emptying compared with normal volunteers.[12]

A double-blind placebo–controlled study using enteric-coated capsules containing 90 mg of peppermint oil and 50 mg of caraway oil (Enteroplant) showed improvements in pain in 89.5% of patients with dyspepsia.[13]

In a systematic review of herbal medicines for functional dyspepsia, in which nine of the 17 randomised clinical trials involved peppermint oil and caraway oil, symptoms were reduced by all treatments (60 to 95% of patients reported an improvement in symptoms).[13]

Enteroplant is not freely available in Australia, but is available in Europe. Caraway oil (freely available in Australia) can be taken separately to enteric-coated peppermint oil with a reasonable response.

Diffuse oesophageal spasm

Diffuse oesophageal spasm is a relatively rare motility disorder of the oesophagus that results in dysphagia, regurgitation and chest pain. It is a difficult condition to treat. Manometric investigations can confirm spasm of the oesophagus plus gastro-oesophageal junction. Peppermint oil can improve spasm on manometric measurement and symptoms are relieved in some patients.[14]

Postoperative nausea

A small placebo–controlled study investigated the efficacy of inhalation of peppermint oil in patients who underwent gynaecological surgery to reduce postoperative nausea.[16] Results showed a statistically significant effect in reducing postoperative nausea through antagonising emetic sensory receptors. Larger studies are necessary to obtain more conclusive data.

How safe is it?

Drug interactions

In animal studies, cyclosporin bioavailability is enhanced by use of peppermint oil.[2] In 12 healthy people, peppermint oil increased bioavailability of felodipine and simvastatin.[17] It is unlikely that drinking peppermint tea or using peppermint oil on skin will lead to interactions.

Precautions, adverse reactions and contraindications

Peppermint oil is considered safe for culinary and medicinal purposes. However, immediate release formulations of peppermint oil can lead to reflux oesophageal symptoms; this is unlikely to occur with enteric-coated peppermint oil.[18]

Peppermint oil can cause contact dermatitis and is contraindicated in people with hypersensitivity to this oil, especially those with aspirin-induced asthma. Due to its choleretic effect, peppermint oil is best avoided in patients with biliary inflammation or obstruction.[1]

The safety of ingestion of peppermint oil in pregnant women is unknown; however, external use on the skin is safe during pregnancy. The oil should not be applied to the face, especially on infants and small children. Use of enteric-coated peppermint oil capsules has not been researched in children less than 8 years of age.

Conclusions

Several trials have shown that enteric-coated peppermint oil capsules can alleviate

the symptoms of IBS. There is some evidence supporting the role of the combination of peppermint oil and caraway oil for the treatment of dyspepsia. Peppermint oil might also have a role in the treatment of diffuse oesophageal spasm and postoperative nausea, but further clinical studies are required. MT

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