Treating nausea and vomiting in pregnancy with ginger

- Qi-Cai Liu

Tiran, D. (2012). Ginger to reduce nausea and vomiting during pregnancy: Evidence of effectiveness is not the same as proof of safety. *Complimentary Therapies in Clinical Practice, 18* (1), 22-25. doi: 10. 1016/j. ctcp. 2011. 08. 007

This article presents a systemic review of the mechanism and safety of using ginger to treat nausea and vomiting in pregnancy (NVP). In the article, the author first introduced the history of ginger as a traditional remedy in some eastern countries, then discussed the potential risk of several different forms of ginger that were available in the UK market. After that, the author explored the mechanisms of ginger's anti-emetic function. Ginger can inhibit serotonin receptor and suppress vasopressin, as well as reduce tachygastric activity. However, the exact mechanism still remains unclear. The author pointed out that there was no consistency in dosages and forms of ginger among current studies, and the differences between nausea and vomiting was not fully understood. Next, the author discussed the safety of using ginger. The author believed that ginger should be treated as a pharmacological medication rather than a " natural" remedy. Therefore, it should be administered with safe dosages and be obtained from the correct plant, *Zingiber officinale* . Following that, the author discussed ginger's potential adverse effects, drug-drug interactions, as well as contraindications and precautions. For example, ginger should be contraindicated for women who have a history of miscarriage because anticoagulation is one of its notable side effects. At the end of article, the author offered a contraindications and precautions checklist, which is very useful for health

care providers to identify which women should avoid ginger. The limitation of this article is that it did not emphasize ginger's therapeutic effects. The strength of this article is the valuable safety checklist. Overall, this article increased the awareness that ginger, although a natural remedy, has side effects and contraindications too.

Ozgoli, G., Goli, M. & Simbar, M. (2009). Effects of ginger capsules on pregnancy, nausea, and vomiting. *The Journal of Alternative and Complementary Medicine* , *15* (3), 243-246. doi: 10. 1089/acm. 2008. 0406

This article describes a single blind clinical trial to determine function of ginger on nausea and vomiting in pregnancy (NVP). 70 pregnant women who experienced nausea and vomiting before 20 weeks of gestation participated this study. Prior to the treatment with ginger, the baseline levels of nausea and vomiting symptoms were measured via a standard visual analogue scale. The participants were randomly assigned to the experimental group and control group. In the experimental group, 35 participants were treated with ginger at a dose of 1000mg/day for 4 days. 35 participants in the control group were treated with a placebo (lactose) with the same dose and prescription form. The treatment effects were measured by asking participants to finish the 4-page questionnaire and record nausea intensity twice a day (3 participants from experimental group failed to complete the questionnaire). A statistically significant decrease in the nausea and vomiting intensity with ginger treatment was reported. 85% of women who received the ginger treatment reported an improvement of nausea symptoms, while only 56% reported improvement in the control group. In addition, the vomiting times for the pregnancy are also significantly

decreased in the experimental group comparing to control group (50% versus 9%). The materials and methods section was well developed with clear description of experimental design, samples selection, data collection and analysis. The strengths of this article are the rigorous experimental design and large sample size. The limitation of this study, as mentioned by the authors, is the short assessment period. As a result, some ginger adverse effects may not be able to discover. The findings of this study provide some evidence-based information about effects of ginger for NVP.

Ensiyeh, J., &Sakineh, MC. (2009). Comparing ginger and vitamin B6 for the treatment of nausea and vomiting in pregnancy: A randomised controlled trial. *Midwifery, 25* (6), 649-653. doi: 10. 1016/j. midw. 2007. 10. 013

This study conducted a double-blind randomized controlled trial to compare the effects of vitamin B6 and ginger for nausea and vomiting in pregnancy (NVP). 70 pregnant women who experienced nausea and vomiting symptoms before their 17 weeks gestation participated this study. Half of them were randomly selected to receive ginger 1g per day treatment for 4 days. As a control, half of them received vitamin B6 40 mg per day treatment at same time. The nausea intensity was measured via a visual analogue scale during the treatment plus 24 hours before. The vomiting episodes were also recorded in the same period. The treatment responses at a 7-day follow-up were measured via a five-point Likert scale (one participant from control group failed to return to clinic later). Their results showed that both ginger and vitamin B6 treatment could decrease the symptoms of nausea, and ginger worked significantly better than the vitamin ($p = 0.024$). In terms to vomiting episodes, both ginger and vitamin B6 could reduce the frequency of

vomiting, and there was no significant difference between them. In the 7-day follow-up visiting, there were 29/35 participants in ginger group and 23/34 participants in vitamin B6 group reported a decrease of nausea reaction (*p* = 0. 52). This trial was well designed with large sample size, strict sampling inclusion criteria, and rigor experimental process. The strength of this study is that they measured and compared the long-term effects of ginger and vitamin B6 on the pregnancy outcomes, such as abortion and preterm birth. The limitation of this study is that they changed the participant's dietary, which might influence the treatments and outcomes. The findings of this study provide some evidence-based knowledge about the efficiency of ginger and vitamin B6 in the NVP treatment, as well as their long-term effects.

Therapy Assessment

Nausea and vomiting are the most common unpleasant complications in early pregnancy. There were about 70-80% of women experienced nausea and 50% of them experienced vomiting episodes during their early pregnancy (Ensiyeh&Sakineh, 2009). That means there are about 350, 000 Canadian women experience nausea and vomiting in pregnancy (NVP) every year (Lee &Saha, 2011). The pathogenesis of NVP remains unclear. However, it is widely accepted that NVP is correlated to the hormone changes during gestation, such as the human chorionic gonadatropin (hCG), progesterone, and estrogen (Lee &Saha, 2011). It was reported that the peak of NVP is positive correlated to hCG peak, and hCG could regulate gastric smooth muscle activity by stimulating placental prostaglandin E2 (PGE2) (Lee &Saha, 2011). Progesterone also has a function of gastric emptying by decreasing smooth muscle contractility (Lee &Saha, 2011). NVP can cause more

undesirable consequences for the pregnant women than uncomfortable, such as social interactions, families, and careers (Ozgoli, Goli, & Simbar, 2009). About 25% of employed pregnant women have to leave their jobs due to the nausea and vomiting symptoms (Ensiyeh&Sakineh, 2009). As a result, it may bring some financial and psychological problem for them, which will further influence the health status of themselves and even their babies' (Ozgoli et al., 2009). Most important, nausea and vomiting symptoms can also change dietary and may lead to malnutrition for themselves and their babies. Therefore, it is very important for the women, who are experiencing NVP, to get treatment in time.

In terms to the treatments of NVP, there are nonpharmacologic approach and pharmacologic approach (Lee &Saha, 2011). The nonpharmacologic approach includes dietary measures, emotional support, acupuncture, and ginger. The pharmacologic approach includes pyridoxin-doxylamine, antiemetics, promotility agents, and antihistamines. The goal of treatment is to release the symptoms and reduce risks for the women and fetus.

It has a long history for using ginger as an herbal medicine to treat NVP in some eastern countries, such as China, Japan, and India (Tiran, 2012). Pregnant women in western countries also knew ginger's anti-emetic effects for a long time (Tiran, 2012). However, it was until recently, the effects of ginger for NVP were studied in the scientific way (Ensiyeh&Sakineh, 2009; Ozgoli et al., 2009). In the Ozgoli et al. study (2009), a single blind clinical trial was conducted to investigate the effects of the ginger for NVP. Their results found that, 1000mg/day ginger treatment could significant decrease nausea symptoms, as well as reduce the frequency of vomiting.

InEnsiyehandSakinehstudy (2009), a double-blind randomized controlled trial was conducted to compare the function of ginger and vitamin B6 for NVP. Their results showed that both ginger and vitamin B6 could reduce the vomiting frequency. The ginger was more efficiency on reduce nausea symptoms than vitamin B6, which has a well known effects on treating NVP. The strength of these two studies is that they proved the ginger's effects on NVP in the scientific way. However, both studies failed to explore the mechanism about how ginger can effectively treat NVP, and one study failed to measure the long-term adverse effects of ginger. These are the weaknesses of these two studies.

Based on these research results, I would like to say ginger is an effective alternative therapy for NVP. In the future nursing practice, I would like to recommend pregnant women to take this herbal medicine to treat their NVP symptom. However, as Tiran (2012) suggested, ginger should also be treated like a pharmacological drug. I must be very cautious about its mechanisms, adverse effects, drug/food interactions, and contraindications before making the recommendation. Being familiar with these knowledge will also enable me to educate each pregnant woman why she can or cannot take ginger to treat her NVP.

Mechanisms

It is well known that ginger is very effective for treating NVP symptoms (Ensiyeh&Sakineh, 2009; Ozgoli et al., 2009). However, the mechanism of its anti-emetic effects still remains unclear (Tiran, 2012). What already known are that the three ginger indigents: gingerols, shogaol, and zingiberence, can

bind to serotonin (5-HT) receptor and block its function to inhibit nausea and vomiting (Tiran, 2012). The major anti-emetic substance in ginger was thought to be gingerols (Tiran, 2012). In addtition, ginger also was reported that it could reduce nausea and vomiting symptoms through suppressing vasopressin to decrease stomach activity (Tiran, 2012). Except these gastrointestinal tract effects, Tiran (2012) thought ginger might also have some effects on the central nervous system. For example, it has sedative and hypnotic functions.

Adverse effects

The adverse effects of ginger can be easily ignored by both pregnant women and health care providers due to its natural remedy character (Tiran, 2012). Like other pharmacological medications, ginger also has some adverse effects (Tiran, 2012). First, ginger has side effects on gastrointestinal tract (Tiran, 2012). Ginger can cause stomach irritant and then lead to heartburn, which may due to its weakly cholinergic function (Tiran, 2012). With the same function, ginger also can stimulate the bile secretion (Tiran, 2012). It is also reported that poorly chewed ginger can cause intestinal blockage (Tiran, 2012). Therefore, it is necessary to recommend women to masticate ginger properly if they are prescribed with the dried root ginger (Tiran, 2012). Second, ginger has adverse effects on cardiovascular system. It is reported that ginger can cause hypotension and that is one reason why some women felt dizziness after had the ginger herbal (Tiran, 2012). Ginger can also cause cardiac arrhythmias, which may due to the interaction with beta receptors (Tiran, 2012). Third, ginger has side effects on the blood. One of its notable side effects is anticoagulant, which increases the risk of bleeding (Tiran,

2012). Beside that, ginger also can lower the blood glucose level, which may increase the risk of hypoglycemia (Tiran, 2012). Fourth, ginger can produce side effects of hot, sweating, constantly thirsty, and looking for cold drinks. These symptoms are caused by its cholinergic function (Tiran, 2012). Last, it needs to keep awareness that the long-term adverse effects of ginger on fetus development are still not fully understood (Tiran, 2012).

Drug/food interactions

Like other pharmacological medications, ginger also has the interactions with other drugs or food (Tiran, 2012). First, abundant evidences showed that ginger can interact with some prescribed medications, such as beta antagonists, benzodiazepines, barbiturates, as well as other herbs such as gingko balboa (Tiran, 2012). Second, ginger has weakly cholinergic function (Tiran, 2012). Therefore it can have interaction with other cholinergic drugs, including antagonists and agonists. For example, ginger can interact with donepezil, a muscarinic agonist, as both can increase the bile secretion. Third, ginger can interact with other drugs which can increase or decrease blood pressure as ginger can cause hypotension (Tiran, 2012). For example, ginger can reduce the anti-hypotension function of epinephrine, an adrenergic agonist. Fourth, ginger can lower blood glucose level (Tiran, 2012). Therefore it can interact with other drugs which can increase or decrease blood glucose level, such as insulin and metformin. Fifth, as mentioned previously, ginger has the function of anticoagulant (Tiran, 2012). Therefore, ginger can interact with other anticoagulant and antiplatelet drugs, such as heparin, warfarin, and aspirin. Last, ginger can cause cardiac

arrhythmia (Tiran, 2012). As a result, ginger can interact with other drugs with can cause cardiac arrhythmia too, such as Levodopa.

Contraindications

As ginger has some adverse effects and drug interactions, it should be contraindicated to the pregnant women who have relevant diseases or are taking the interactive drugs. First, ginger should be contraindicated for the women with certain gastrointestinal tract diseases (Tiran, 2012). Pregnant women with gastroesophageal reflux disease (GERD) or heartburn symptom should avoid ginger as it can worsen this symptom by irritating stomach (Tiran, 2012). Pregnant women with a history of gallstones should be contraindicated because ginger can stimulate the secretion of bile (Tiran, 2012). Dried root ginger should not be prescribed to pregnant women who have lower gastrointestinal tract disease, such as duodenal ulcer, as it may cause intestinal blockage (Tiran, 2012). Second, pregnant women with certain cardiovascular diseases should also be contraindicated from ginger (Tiran, 2012). Ginger can cause hypotension (Tiran, 2012), therefore the women who with hypotension symptom or are taking anti-hypertensive drugs to control their blood pressure should not take ginger. Ginger also can cause cardiac arrhythmia (Tiran, 2012). As a result, ginger should not be prescribed to the pregnant women who have cardiac arrhythmia or are taking anti-arrhythmic drugs, such as Na^+ and K^+ channel blockers. Tiran (2012) even suggested that all the herbal remedies and complementary therapies should be contraindicated for pregnant women who have major cardiac diseases. Third, ginger should be contraindicated for pregnant

women with bleeding disorders as it has a function of anticoagulant. Tiran (2012) suggested that any pregnant women who had a history of miscarriage, vaginal bleeding, or clotting disorder should not take ginger. These women who may have a surgery several weeks later also should stop taking ginger at least two weeks before the operation (Tiran, 2012). Fourth, ginger has a function of lower blood glucose (Tiran, 2012). Therefore ginger should be avoided from those women who are taking drugs to control their diabetes mellitus, such as insulin and metformin. The women who have hypoglycemia also should also be contraindicated from ginger. Last, ginger has interactions with the benzodiazepines, beta blockers, and gingko biloba (Tiran, 2012). Therefore it should be avoided for the pregnant women who are taking those drugs.

Conclusion

Ginger is an effective herbal medicine in treating NVP although its mechanism still remains to explore. As a pharmacological medication, ginger has its own adverse effects, drug/food interactions, and contraindications. Ginger is not always safe for every pregnant woman who are experiencing nausea and vomiting symptoms. The women prescribed with ginger should be educated with its adverse effects and its possible interaction with other drugs. In addition, the women, who have certain gastrointestinal tract diseases, certain cardiovascular diseases, bleeding disorders, and hypoglycemia, should also be contraindicated from ginger. Overall, ginger should be treated like a pharmacological medication rather than a natural remedy when being prescribed for NVP treatment.

References

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