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INTERNATIONAL COLUMN

Effectiveness of ginger to overcome nausea and vomiting caused by chemotherapy in breast cancer patients

by Dwi Fitriyanti and Reni Sulung

ABSTRACT

Chemotherapy has serious side effects that may be detrimental to the patient, namely complaints of nausea and vomiting. To reduce the side effects of chemotherapy, many patients in our country choose herbal therapy. One such therapy is the intake of ginger. The aim of this article is to explore the effectiveness of ginger to overcome nausea and vomiting caused by chemotherapy in breast cancer patients. The method used is a systematic review. Results of the study suggest that ginger is only effective to reduce nausea, but does not lower the frequency of vomiting caused by chemotherapy in breast cancer patients.

Key words: ginger, nausea and vomiting, breast cancer patients under chemotherapy

INTRODUCTION

Cancer is one of the leading causes of death worldwide. In 2017, about 9 million deaths were caused by cancer. Breast cancer is the biggest cause of death every year for women. In Indonesia, an estimated 252,710 new cases of invasive breast cancer will be diagnosed in women along with 63,410 cases of in situ breast carcinoma. About 40,610 women are expected to die of breast cancer in 2017. Management of breast cancer includes surgery, radiation, chemotherapy, and biological therapy. However, there are other possible methods that can be used in overcoming the problems of breast cancer, for example, complementary therapy (HDI, 2015).

Chemotherapy is one of the interventions that is often given in the treatment of cancer, including breast cancer. It is considered to be more systemically effective for killing cells both in the early and advanced stages of breast cancer. Chemotherapy has serious side effects that can be detrimental to the patient, namely the presence of complaints of nausea and vomiting. Approximately 80% of patients who received chemotherapy complain of nausea and vomiting. The nausea and vomiting

from chemotherapy is caused by stimulation of the chemoreceptor-trigger zone in the vomiting centre (Lemone & Burke, 2008).

Side effects of nausea and chemotherapy can have a significant impact on the quality of life of patients. Such side effects include fluid and electrolyte imbalances, reduced nutritional intake (malnutrition) and impact on other diseases. Affected patients may not continue treatment or receive their next chemotherapy dose late. Therefore, cancer patients who experience chemotherapy-induced nausea and vomiting (CINV) may choose complementary and alternative medicine such as herbal therapy (Desen, 2008).

Ginger (*Zingiber officinale*) is one of the most commonly used herbs as a traditional medicine. It is used effectively as a complementary therapy, as it is believed to be an anti-nausea agent. It may be possible to use it especially for anti-CINV therapy. Ginger has been used for many years as a traditional medicine for nausea and vomiting in pregnancy. Although the antiemetic property of ginger has not been fully explained, the ginger content thought to play a role in the mechanism is gingerols, shogaols, galanolactone, and terpenoids (Glare, Miller, & Tickoo, 2011).

PURPOSE

The purpose of this study was to find out whether ginger can effectively reduce the frequency of nausea and vomiting caused by chemotherapy in breast cancer patients.

METHOD

The method used in this study was a systematic review. The criteria for inclusion of studies were:

- Study type: All types of research with an experimental design (e.g., experimental, pre-experimental, and quasi-experimental)
- Respondent type: Adult patients with breast cancer who experience nausea and vomiting caused by chemotherapy
- Type of intervention: Interventions given are oral intake of ginger (*ginger/zingiber officinale*)
- Outcome measured: The final results measured in research articles reviewed are decreased frequency of nausea and vomiting caused by chemotherapy.

An online literature search was conducted. Databases searched included Science Direct, EBSCO, Google Scholar and PubMed in accordance with key words outlined in Table 1.

AUTHOR NOTES



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Table 1. Article search keywords
Article search step based on keywords
1. Ginger
2. Zingiber officinale
3. 1 OR 2
4. Chemotherapy
5. Nausea and vomiting
6. CINV (Chemotherapy Induced Nausea and Vomiting)
7. 1 OR 2 AND 4 AND 5 OR 6
8. Cancer
9. Breast cancer
10. 1 OR 2 AND 4 AND 5 OR 6 AND 8 OR 9

Table 2. Search results				
Database	Science Direct	EBSCO	Google Scholar	PubMed
Search results	344	106	4.240	171
Full-text, pdf, 2006-2016	198	30	2.500	26
Same title	3	6	4	7
Eligible according to inclusion and exclusion criteria	-	1	-	2
RESULT FOR FINAL INCLUSION		3		
Data extraction in systematic review is as follows				

Table 3. Characteristics of studies			
Author	Respondents	Method	Result
Panahi et al. (2012)	100 adult female respondents (mean age 51.83 years)	A pilot, randomized, open-label clinical trial	$p=0.04$. There was a significant difference between the prevalence of nausea, but not vomiting, with additional ginger for standard antiemetic therapy at 6 to 24 h post chemotherapy in the ginger group, compared with the control group. However, there was no significant difference in the prevalence of nausea, vomiting between the treatment group and the control group at all intervals (mild, moderate, severe, very severe) assessed in the first 6 hours, second, third, and fourth post chemotherapy days ($p > 0.05$).
Arslan & Ozdemir. (2015)	60 adult female respondents (mean age 48.5 years) received standard antiemetic drugs with 30 respondents (intervention group) and 30 respondents (control group).	Experimental randomized controlled trial	$p < 0.05$. The severity of nausea and the amount of vomiting was significantly lower in the intervention group than in the control group. However, the change in the number vomiting was not statistically significant ($p > 0.05$) in the severity of acute nausea and the severity of delayed nausea between the intervention and control groups after the intervention.
Sanaati et al. (2016)	45 adult female respondents (20–60 years), 15 respondents (intervention group 1), 15 respondents (intervention group 2), 15 control group respondents	Randomized, double-blind and clinical trial study	$p = 0.238$. Ginger and chamomile are not effective on the intensity of nausea, while ginger and chamomile are both significantly effective for reducing the frequency of vomiting ($p < 0.0001$). In addition, ginger can more effectively reduce the frequency of nausea ($p = 0.006$) than chamomile ($p = 0.895$).

RESULTS

Table 2 presents the number of papers identified during the search through several databases and the results of applying the pre-set criteria. Only three studies could be included in the final analysis. The three studies used an experimental research design: a pilot, randomized, open-label clinical trial; randomized controlled trial; and a randomized, double-blind clinical trial study. Each article was assessed by the authors as having high quality. The first article appeared in 2012, with the second in 2015, and the last one in 2016. Table 3 highlights the key findings from the three studies. The intervention given for the three research articles was oral intake of ginger with a dose varying between 1 g–1.5 g/day in the intervention group. One article described giving chamomile extract two times a day and 500 mg capsules of Matricaria chamomilla extract in addition to a routine antiemetic regimen. Meanwhile, all studies utilized a control group in which a standard routine antiemetic regimen was given: granisetron plus dexamethasone for the first article, granisetron plus dexamethasone in the second, and a routine antiemetic regimen consisting of DMA capsule (dexamethasone, metoclopramide and aprepit) in the third.

The three articles showed different results. For the first article, there was a significant difference between the prevalence of nausea, but not vomiting, with the addition of ginger to standard antiemetic therapy in the 6 to 24 hours following chemotherapy in the ginger group compared to the control. However, there was no significant difference in the prevalence of nausea or vomiting between the treatment and control groups at all intervals (mild, moderate, severe, very severe) assessed in the first, second, and third with six-hour periods. The second article showed that nausea severity and the number of vomits were significantly lower in the intervention group compared to

the control group. However, changes in the amount of vomiting were not statistically significant ($p > 0.05$); nor was the severity of acute nausea and delayed nausea severity between the intervention and control groups after the intervention. In the third article, ginger and chamomile are not effective on the intensity of nausea while ginger and chamomile are both significantly effective for reducing the frequency of vomiting ($p < 0.0001$). In addition, ginger can more effectively reduce the frequency of nausea ($p = 0.006$) than chamomile ($p = 0.895$). It can be concluded that ginger is effective in reducing nausea but does not reduce the frequency of vomiting. Ginger can reduce the amount of vomiting when combined with chamomile and ginger can more effectively reduce nausea than chamomile.

DISCUSSION

All three articles indicate that ginger is effective in reducing nausea and does not decrease the frequency of vomiting from chemotherapy. Additionally, that effect only lasts for the first 6 to 24 hours of chemotherapy. Additionally, that effect only lasts for the first 6 to 24 hours of chemotherapy. In studying the usefulness of ginger for patients undergoing chemotherapy, it was found that at least 1–1.5 g/day ginger can reduce symptoms of nausea to 40%. Although there was no significant difference in preventing vomiting with using ginger, Sanaati, Najafi, Kashaninia, and Sadeghi (2016) showed that ginger and chamomile given together were significantly effective at reducing the frequency of vomiting. This means that the ginger intervention will be more likely to be effective when combined with other identical extracts to reduce the frequency of vomiting.

The strengths and weaknesses of the article

In the Panahi, Saadat, Sahebkar, Hashemian, Taghikhani, and Abolhasani (2012) study, investigators had the advantage of identifying the prevalence of nausea and vomiting between the treatment group and the control group at all levels (i.e., mild, moderate, severe, very severe) assessed in the

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first, second, third and fourth 6 hours post-chemotherapy day in each chemotherapy cycle. The respondents in this study included a good sample size (100 respondents) in comparison to the other studies and ginger was given in the intervention group at 1.5 g/day, again more than other studies.

The Sanaati, Najafi, Kashaninia, and Sadeghi (2016) study had the advantage of using two groups for giving treatment, specifically in the first group giving ginger and solids intake and in the second group giving chamomile extract. The control group was only given an antiemetic regimen. Another advantage in this article was comparing the effects of giving two interventions interchangeably with the same respondent, therefore identifying which would be more effective of the two treatments. Besides the advantages, the drawbacks in this article were the small samples and the results of the comparison between the control and intervention groups.

The Arslan and Ozdemir study (2015) had the advantage of a comparison between the control and treatment groups for the number of episodes of nausea and vomiting. A disadvantage is that the specific method of research is not fully explained, only that the method used was randomized. Also, the type of antiemetic regimen in the control group was not specifically explained.

CONCLUSION

The results of this systematic review indicate that ginger is only effective in reducing nausea, but does not decrease the frequency of vomiting caused by chemotherapy in breast cancer patients. On the other hand, ginger is more effective to lower the frequency of nausea compared with other extracts of chamomile. Given that all respondents, in both intervention and control groups were still given antiemetics, the possibility of ginger effectively decreasing the frequency of nausea is not too great. Further research is needed to eliminate confounding factors that may affect future research results and determine the effectiveness of ginger in decreasing both nausea and vomiting.

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