

# Effect Of Ginger Infusion On Chemotherapy Induced Nausea And Vomiting In Breast Cancer Patients

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## ABSTRACT

Nausea and vomiting are the most common side effects of chemotherapy. Ginger is one of complementary therapy to treat nausea and vomiting. The purpose of this study was to determine the effect of ginger infuse for nausea and vomiting side effects of chemotherapy in breast cancer patients. Control Time Series Design was used to collect the data. Purposive sampling technique was used to get sample with total sample was 20 people. Rhodes Index Nausea Vomiting and Reching were used for scaling nausea and vomiting. Therapy was given from second until sixth day after chemotherapy. Data analyzed with Friedman Test and Mann-Whitney Test. The results of this study showed that the significant decreased of nausea and vomiting in experimental group ( $p = 0.000$ ) is better than control grup ( $p=0,011$ ). Differences nausea vomiting experimental group and the control group significant with value of  $p = 0.036$ . It is recommended to use ginger as a complementary therapy in the management of Chemotherapy Induced Nausea and Vomiting.

**Keywords:** *ginger*, complementary therapy, nausea, vomiting, chemotherapy, breast cancer

## 1. Introduction

Breast cancer is the carcinoma which comes from breast ductal and lobule (Brashers 2007, Reifmanto 2010). According to the International Agency for Research on Cancer / IARC (2008), breast cancer is the first ranks in the world based on the incidence and the second rank based on mortality. Nowadays, cancer therapy consists of surgery, radiotherapy, chemotherapy and biological therapy as well as some other methods. In the locally advanced stage chemotherapy is often the only effective method of cancer therapy. Chemotherapy is the using of anti-cancer drugs to destroy cancer cells. The treatment of breast cancer with chemotherapy is used at all stages was agreed by oncologists in the world (Wibisono 2009).

Since proliferation also occurs in some normal organs, chemotherapy also gives toxic effect to normal cells, especially the particular with a rapid cell cycle tissues such as the bone marrow, epithelial mucosa and hair follicles (Saleh 2006). One of the most common side effects is nausea and vomiting (Otto 2005). According to Firman (2010), almost 70-80% of chemotherapy patients get nausea and vomiting. According to the Nurses Board Of Victoria (2006), complementary therapy is defined as the solution about the problem of healing that is selected and used in the practice of nursing to improve health, gain healing and quality of life, balance of life, and the scope of holistic treatments. It is very supportive of nursing science as in line with the concept in the science of nursing, where nurses believe something holistic in humans, known as the *philosophy of caring* (Ignatavicius & Workman 2006). Herbal therapy is the most commonly complementary therapies used among the public. According to the dictionary of nursing, herbalism is the therapeutic use of herbal (plants) and minerals (Hinchliff 1999).

Gumbel (1993) found that human physiology and plants physiology have a common in terms of hormones, enzymes, and chemical composition in the body. The research results reveal that the roots and wood efficacious cure human stomach. One of the roots of the plant are used as medicine is ginger. In taxonomy ginger is in *Spermatophyta* division, sub-division of *angiosperms*, *monocotyledonease* class, order *zingiberales*, *Zingiberaceae* family, genus *Zingiber* (Suhartati & Roslinda 2009).

A meta-analysis by Ernst and Pittler (2000) revealed that ginger may have a positive effect on nausea and vomiting caused by chemotherapy or pregnancy or post-surgery. According to Schwartz (2011), the effectiveness of ginger in relieving Chemotrtherapy induced nausea and vomiting as still needs the proof. Some researches about ginger in reducing nausea and vomiting as the side effects of chemotherapy have not proved a

significant decrease yet. Therefore, the authors are interested in doing a study to determine the effect of ginger infusion on chemotherapy induced nausea and vomiting in breast cancer patients.

## 2. Data Analysis

Data was collected from April-May 2013 in the Women's Chemoterapy Room RSUP Dr M Djamil Padang Indonesia, using Control Time Series Design. Purposive sampling technique was used to collect the data with total sample 20 people. Rhodes Index Nausea Vomiting and Reching were used for scaling nausea and vomiting. Therapy was given from second until sixth day after chemotherapy. The data were analyzed with SPSS 17 using the Friedman test and Mann-Whitney.

## 3. Method

Research conducted on breast cancer patients at the Women's Hospital Operating Theatre Dr. M. Djamil Padang. Respondent amounted to 20 people and is divided into two groups, 10 respondents as experimental group and 10 respondents as control group. The data collection instrument used in this study is the Rhodes Index Reching Nausea and Vomiting (Rhodes INVR). Data recording sheet contains biographical data of respondents respondent demographics, types of breast cancer and chemotherapy cycles.

Intervention began on second day after chemotherapy. Patients drink ginger infusion, the infusion prepared with 10% crude drugs, namely 10 grams of botanicals plus 100 ml of water (for 10 servings). Infusion was made from fresh *Zingiber officinale* varietas rubrum, the ginger was cleaned and thinly pared leather after that it grated with the overall degree of smoothness 2,5mm, put finely ground ginger for 15 minutes starting from 90°C temperature and stirring occasionally, straining after cold and dilute to 150ml. Respondents drank it thrice a day. Respondents still take antiemetic drugs are prescribed.

Inclusion criteria:

- a) Breast cancer patients receiving chemo therapy CAF (Cyclophosphamide, Adriamycin-5-fluoro uracil)
- b) Anti-emetic ondasetron and dexametason.
- c) Willing to participate in research and execute procedures to complete and sign an informed consent.

Exclusion criteria:

- a) Respondents who resigned
- b) Unable to write read
- c) Do not like ginger
- d) An allergy to ginger and experiencing side effects
- e) Have a blood clotting disorder

## 4. Result

The results, based on the age of the experimental group, nearly half (40%) in the age range 30-39 years and range 40-49 years (40%). In the control group more than half of respondents (60%) in the 40-49 years susceptible age. Based on cycles of chemotherapy followed, half (50%) of respondents to the experimental group 2 underwent chemotherapy, whereas the control group nearly as fragile patients undergoing chemotherapy to 4 (40%).

Based on the latest education respondents in the experimental group 50% and 50% had elementary school. In the control group almost half (40%) of respondents educated past high school. Based on the work, the highest proportion is a housewife that is 80% in the experimental group and 60% in the control group.

Statistical test results obtained with the Friedman test, there is a significant decrease in the value of nausea and vomiting in 7 times taking the measurements in the experimental group were given ginger boiled water with p value = 0.000. Friedman test was also performed in the control group with p = 0.011 (p < 0.05), its mean there is a significant difference in nausea and vomiting in 7 measurements in the control group were not given ginger boiled water.

Mann-Whitney test showed the differences in the incidence of nausea and vomiting in the experimental group and the control group, in which the value of  $p = 0.036$  so that there is a significant difference between the experimental group and nausea vomiting nausea vomiting control group.

## 5. Discussion

Friedman test in the control group showed  $p = 0.011$  ( $p < 0.05$ ). It mean nausea vomiting side effects of chemotherapy in the control group dropped significantly. The cycles of chemotherapy were done in 21 days, nausea and vomiting will occur for a few days, but the symptoms will usually disappear within a week after receiving the drug (Indrawati 2009). Decrease in the incidence of nausea and vomiting caused by the antiemetic work Ondansetron and dexametason which is antiemetic with a high therapeutic index (Hesket 2008). Ondansetron is a 5-HT<sub>3</sub> receptor antagonist that selectively inhibits the presynaptic serotonin receptors on the vagus nerve sensors in the intestinal wall. Dexamethasone is a corticosteroid which showed good efficacy for the prevention of acute nausea and delayed nausea and vomiting due to cytotoxic with moderate emetogenic (Dipiro & Thomas 2005).

In addition to antiemetic respondents also get other drugs that ranitidine, paracetamol and vitamins. 2x25mg/ml ranitidine and ranitidine on 1x150mg oral chemotherapy for 6 days. According to researchers the use of ranitidine although not intended as a preventive antiemetic (prophylactic) nausea because stomach acid is high. Ranitidine is a H<sub>2</sub> receptor antagonists that inhibit the action of histamine and reduces gastric acid secretion (Tjay & Kirana 2007). Friedman test in the experimental group showed the value of  $p = 0.000$  ( $p < 0.05$ ). Means nausea vomiting experimental group dropped significantly. In addition to the effects of antiemetic drugs decrease nausea and vomiting also occur because water boiled ginger because ginger has antiemetic effects (Waskito 2008). This result is in line with studies without control groups conducted by Meyer that ginger is effective in reducing the severity of nausea caused by chemotherapy in eleven patients leather T-cell lymphoma treated psoralens (Meyer, Schwartz, et al. 1995).

Based on the Mann-Whitney test the effect of water decoction of ginger against nausea and vomiting side effects of chemotherapy in breast cancer patients in Dr M Djamil Padang find  $p = 0.036$ . Then there is a significant difference in nausea and vomiting in the experimental group and the control group. The results are not much different from the researcher Pillai (2011) which provides a combination of 40 mg / m<sup>2</sup> cisplatin / day and 25 mg / m<sup>2</sup> of doxorubicin / day for patients with osteosarcoma child for three days. Placebo given to the control group, and ginger capsules taken twice daily (167 mg of ginger powder for children weighing 20-40 kg and 400 mg for children weighing 40-60 kg). Ginger powder was found to reduce acute and delayed nausea and vomiting side effects of chemotherapy such as ondansetron and dexametazone.

Alparslan (2012) also found a significant difference in nausea and vomiting between the groups that received ginger with a control group where the intervention (2x400mg) given ginger capsules every morning and evening after the patient came to the outpatient clinic completed chemotherapy cycles. Ryan (2010) found that slightly different discovery that 576 cancer patients admit to ginger dose of 0.5 grams, 1.0 grams and 1.5 grams significantly reduces the severity of acute nausea compared with placebo on day 1 of chemotherapy. The largest decrease the intensity of nausea occurred at doses of 0.5g and 1.0g. However, this effect tends to decrease after 24 hours so there is no significant reduction in delayed nausea and vomiting.

Levine (2008) used 28 cancer patients receiving high emetogenic cytotoxic who were divided into three groups. The first group received a moderate protein diet, and ginger, the second group received a diet high in protein and ginger, and three groups received a normal diet. In the study reported nausea in patients receiving high-protein diet and a little more ginger than the two other groups. The possibility to decrease nausea and vomiting is better in experimental group than the control group ( $0.000 < 0.011$ ) due to the effect of ginger in synergism with antiemetic drugs. Antiemetic effects associated with peripheral lines with aromatic, carminative or absorption effects (Alparslan, 2012). According to researchers antiemetic effect of ginger works melalului peripheral pathways aromatic scent when oil vapor to evaporate arrested ginger nose.

Stimulation of piping aroma will be delivered to the limbic system to the hypothalamus and amygdala (Price 2007). Next, neorokimia will be release with euphoric, relaxant and sedative in the limbic system. In the amygdala itself there chemoreceptor cells that are sensitive to smells that can instantly reduce nausea and vomiting. Ginger containing protease and lipase which helps the body digest and absorb food. In this case the antiemetic effect of ginger works by speeding up the absorption. Ginger also contains glycerol which can block serotonin (Waskito 2008). Gingerol and shogaol is antiemetic that works like a 5HT<sub>3</sub> antagonist, the 5HT<sub>3</sub>

receptor ion channel complex directly binds serotonin modulator. Additionally shogaols and gingerol also antihistamines (Aziz, et al 2006, Yamahara, et al 1995).

According to researchers antiemetic effect of ginger works as the antiemetic drugs work by interfering with neurotransmitter nausea vomiting. In this study there are no reports of adverse effects from the consumption of ginger. Ginger does not inhibit the effectiveness of chemotherapy drugs (Ryan & Morrow 2008). Several things can affect nausea and vomiting but ignored in this study include conditions such as complications and metastasis respondents, metabolic disorders, stomach disorders, and the influence of the drug before. Physical complications of cancer (metastatic brain or intestinal obstruction), metabolic complications (hypercalcemia), other factors such as the (stomach ulcers / gastroenteritis) may cause emesis (Glaus, Knipping, et al 2004).

However, in this study all the nausea and vomiting that occurs after administration of cytostatic regarded as nausea and vomiting side effects of chemotherapy. Another overlooked factor is the intake of food, but certain foods can aggravate nausea, vomiting, respondents who did not eat at all also can aggravate nausea and vomiting due to an increase in gastric acid. Furthermore although the mechanism is not known, it is believed that the protein can prevent gastric dysrhythmias associated with increased nausea. High-protein diet reduced the incidence of nausea compared isocalorik foods such as fats and carbohydrates (Levine, Gilis, et al 2008). Another overlooked factor is the patient's history of nausea and vomiting. History of emesis will lead to more difficult patients to control nausea and vomiting (Susanti & Mula 2010). Besides giving ginger procedure given on day 2, while acute nausea and vomiting was skipped. Based on the findings of the study only 5% of respondents who experienced delayed nausea and vomiting without nausea and vomiting experienced acute. So that ginger may be effective when given before chemotherapy to prevent nausea and vomiting. Ginger is a negligible factor homogeneity age and ginger are used. Ginger is used in this study is a red ginger, red ginger because the substances contained gingerol, oleoresin and essential oil higher than other varieties. Red ginger essential oils reach the womb, gingerol and sagaol optimum in a fresh state the age old enough (8-9 months).

## 6. Conclusion

The results of research on the effect of ginger infusion on chemotherapy induced nausea and vomiting in breast cancer patients showed that the significant decreased of nausea and vomiting in experimental group ( $p = 0.000$ ) is better than control grup ( $p=0,011$ ). Differences nausea vomiting experimental group and the control group significant with value of  $p = 0.036$ .

## 7. Advice

Need more research on the effectiveness of ginger to treat nausea and vomiting for chemotherapy patients with more homogeneous sample, higher numbers presentatif, and control of food intake variables.

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