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The effect of auricular acupressure on nausea and vomiting caused by chemotherapy among breast cancer patients

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ABSTRACT

Objective: The aim of this study was to determine the effect of auricular acupressure in relieving nausea and vomiting among the women who received chemotherapy.
Methods: 48 women suffering from Breast Cancer and receiving chemotherapy were recruited for the study. The patients were randomly assigned into two groups of experiment and control. In the initial phase of chemotherapy, the experimental group received standard medications to control nausea and vomiting and auricular acupressure for five days. Meanwhile, the control group received only the standard medications.
Results: The use of auricular acupressure led to the decrease in the number and intensity of nausea and vomiting in both the acute and delayed phases in experimental group which were significantly lower than the control group (P = 0/001).
Conclusions: It is suggested that nurses use this pressure technique as a complementary treatment, non – pharmacological, inexpensive, non-invasive approach for the relief of chemotherapy-induced nausea and vomiting.

1. Introduction

Breast cancer (BC) is one of the most common malignancies in women [1]. Despite the considerable progress in medicine, BC is still one of the deadliest malignancies worldwide [2]. This disease is the most prevalent types of cancer among women in Iran [3]. And proportion rate has been reported to be 10% [4].

Treating BC is complicated and consists of surgery, chemotherapy, biotherapy, radiotherapy, and plastic surgery [5]. One of the main alternatives for treating BC is chemotherapy which is still most utilized cancer treatment [6]. Currently, most patients who use a chemotherapy regimen receive anthracycline with cyclophosphamide and taxane which cause more than 90% nausea [1].

Nausea and vomiting are the most common side effects caused by these medications experienced by almost 40–80% of patients [7] and these side effects are categorized into three types: acute, delayed and predictable [8–10].

The nausea and vomiting that starts between 1 and 2 h after prescribing chemotherapy medicines and that can last for 24 h afterwards is known as acute and the delayed type refers to a state in which nausea and vomiting that commonly experienced at home from the second to the fifth day following chemotherapy [9]. This condition is experienced in varying degrees by patients who receive chemotherapy and can have a terribly negative impact on their quality of life. In addition, serious metabolic side effects (hypothermia, hypokalemia, etc), defect in immune system, disturbance in physical activities, socio-cognitive functioning, and depression are among the side effects. Therefore, it is important to prevent and even control the nausea caused by chemotherapy

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among patients suffering from cancer [9].; otherwise, about 20% of patients may refuse to undergo therapeutic treatments in case of being improperly controlled [11].

The effective medicines used to control nausea and vomiting as the standard treatment for preventing nausea are the serotonin receptors antagonists of corticosteroids and metoclopramide. Research has shown that even after prophylaxis, with these medications, the incidence rate of acute and delayed nausea and vomiting can be prevented are up to 50% [12]. Nevertheless, the high cost of anti-nausea and vomiting agents and their side effects including extra pyramidal disorders, hypotension, headache, constipation, fatigue, mouth dryness, vertigo, diarrhea and irritability have all imposed limits on the coverage of these drugs [8,9,13].

Although pharmacological prescription could be attributed to a decrease in the incidence rate of nausea and vomiting, but studies have shown that they do not help completely, so using non-pharmacological methods are preferable [14]. Thus, listening to music, relaxation techniques, hypnotism, yoga, acupressure and acupuncture which have recently been extensively used for relieving nausea are recommended [9].

One of the non-pharmacological methods for controlling nausea and vomiting is the use of acupressure. This method had numerous advantages which are being non-invasiveness, lack of need to any special tool or instrument, availability and the ease of use and learning by nurses and patients which can finally lead to its application by patients themselves and the elimination of need to being visited at doctor's office [15]. According to the evidence provided by the National Institute of Health and also the relevant studies done in this regard, administering acupressure in preventing and treating the nausea and vomiting induced by chemotherapy could be useful as the same methods that were used in some countries like the USA and Germany [16]. Acupressure is a non-invasive method for treating nausea and vomiting which has the same effect as acupuncture and can be administered in different parts of body [14,17]. Besides, auriculotherapy or auricular acupressure (AA) is one of the more widely used microsystem within eastern medicine. It is a therapeutic method in Chinese traditional medicine which is performed by stimulating special points of the ear that are connected to certain parts of the body [16]. Also,this method is one the most favorite therapeutic methods in different countries and is extensively applied by both doctors and nurses as a preventive-therapeutic measure [18]. With regard to ethical-legal issues, using acupressure has been recognized by the Federal Nursing Council in its 197/97 resolution as being within the professional prowess of nurses [19]. Hence, by stimulating different points on the ear by needles, granules, electric stimulation or a combination of them, a host of disorders can be treated by this method, such as rapid relief of pain, or any chronic or acute pains, psychological disturbances (anxiety and depression, attention deficit), dizziness, facilitating cigar withdrawal, reducing inflammation, disorders in endocrine glands and urinary system, infectious diseases, obesity, nausea, and so on [19]. Using tiny seed in AA is inexpensive, non-invasive, painless, safe, quick and also adaptable to environmental conditions which does not have any side effects, so AA could be a good choice for managing the nausea and vomiting caused by chemotherapy [18,20]. Evidence shows that numerous studies have been done on using acupressure and the effect of AA for treating some diseases, but few studies have been done on investigating the effect of AA on the amount of the nausea and vomiting caused by chemotherapy. Nurses as major members of therapeutic team, can use AA to treat the patients. By doing so, they would be able to increase the quality of care for their patients, relieve their pains, and increase treatment satisfaction. Hence, the present research was carried out with the aim of identifying the effect of AA on chemotherapy-induced nausea and vomiting.

2. Method

2.1. Study design

This study is a crossover clinical trial design (diagram 1).

2.2. Sampling

This study was conducted on 48 women who were undergoing chemotherapy (Sample size based on Parent and Fortin's (2000) study required to achieve 80% power at a significance level of 5% was calculated). The patients were selected from two hospitals located in an urban area of Iran. The study units were chosen based on the randomly assigned two groups, the control (group A) and experiment (group B).

Both groups received information on how to fill in the questionnaires prior to chemotherapy and the researcher taught AA to patients, so that they would be informed about the type of intervention that they were going to receive in this study. Afterwards, they underwent with chemotherapy treatment and their acute and delayed chemotherapy-induced nausea and vomiting were investigated daily for 5 days through using Moro questionnaire. In other word, the experiment group received AA besides anti-nausea and vomiting medications. Meanwhile, the researcher contacted the patients or the caregiver every day by phone and reminded them of administering acupressure and filling in the questionnaires. Throughout this period, the control group received only the standard anti-nausea and vomiting medications to control their discomfort.

The method of AA was done through this procedure: before chemotherapy, both auricular of pinna were initially cleansed by 75% alcohol and then point zero, stomach, brainstem, shenmen, and cardia that are effective for controlling nausea and vomiting were identified (Fig. 1); then, the researcher placed an ear seed on each point and pasted it with a special non-latex adhesive. Afterwards, the researcher trained the patients to press each point at least 3 times every day (morning, noon and night) for 3 min. The pressure techniques included a mild stimulation through a stable and

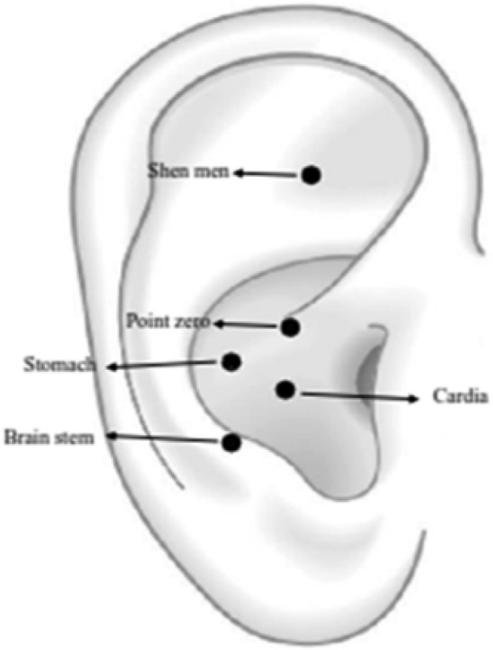

Fig. 1. Auricular appoint for chemotherapy induced nausea and vomiting.

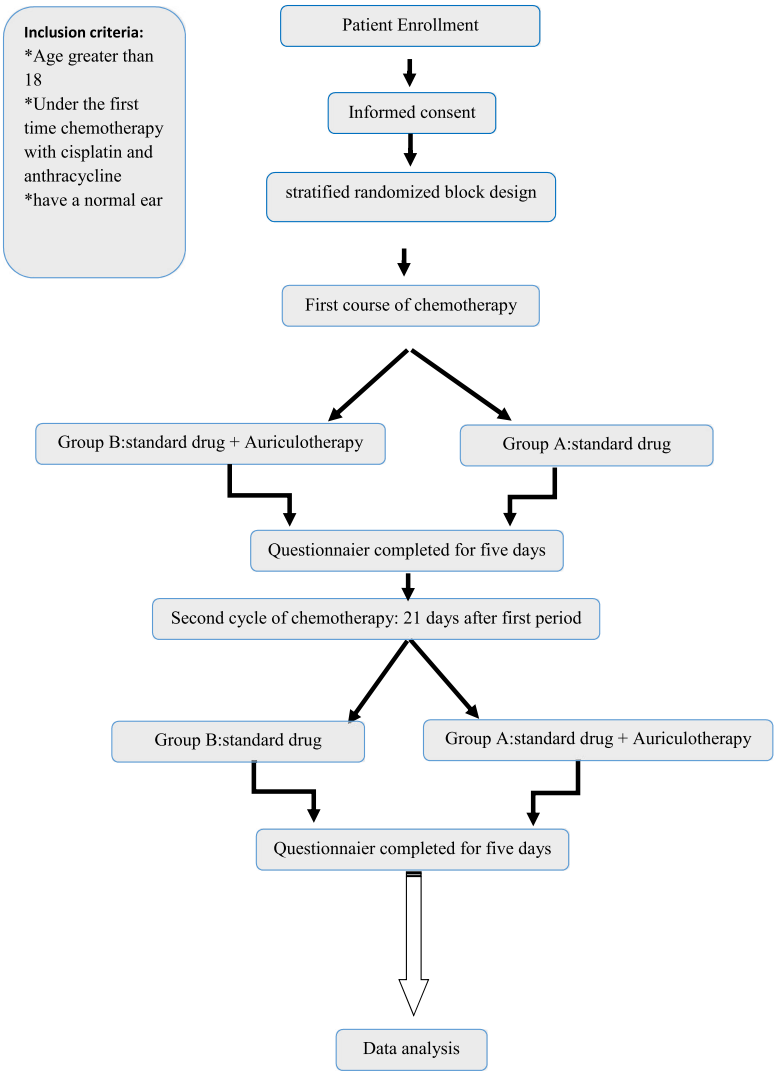

Fig. 2. Flow chart of patient requirement.

gradually firmer pressure until started having mild tingling sensation or a slight sense of discomfort. Moreover, this action was to be preferably done before vomiting once having the sensation of nausea. The ear seeds remained in their place for 5 days to control acute and delayed nausea and vomiting, after which the researcher asked the patients to remove them. When patients referred for the second cycle of chemotherapy after three weeks, the position of two groups (experimental and control) was exchanged with each other (see Fig. 2).

The inclusion criteria:

- Age more than 18 years old
- Receiving chemotherapy with mild to severe stages using such as cisplatin and anthracycline
- Have a normal, uninjured and healthy state
- Do not have any record of using acupressure within the last three months
- Do not take any anti-nausea and vomiting agents (other than those prescribed by their own doctor)
- Do not suffer from nausea-inducing diseases like liver and kidney disorders, digestive problems, acute hepatitis B, obstruction of digestive system, and cerebral malignancies.

In addition, the exclusion criteria in this study were the patients who were receiving total radiotherapy in the upper stomach or ear and also those who were not willing to participate in the research.

2.3. Instrument

The data were collected by applying a two-part questionnaire. The first part of questionnaire was about demographic and chemotherapy-related data, and the second part was Morrow standard questionnaire (1984) which has 16 items and has been designed to explore and evaluate nausea and vomiting before, during and after chemotherapy, its duration, intensity and time of deterioration. This questionnaire has a 7-degree Likert scale on which zero represents “not at all” and six stands for “unbearable”. It is actually a self-report questionnaire which is filled in by the patients themselves.

The validity of the demographical questionnaire was checked using the content validity method. The questionnaire was given to 10 faculty members of Tehran University of Medical Sciences to apply their suggestions for the improvement of the questionnaire items.

The validity of the Moro standard questionnaire was also determined using the content validity method. It should be

Table 1
Intensity of acute and delayed nausea in group A and B.

Group B		Group A		Intensity of nausea (Mean ± SD)
Second period chemotherapy (control)	First period chemotherapy (AA)	Second period chemotherapy (AA)	First period chemotherapy (control)	
7.54 ± 4.14	3.71 ± 4.05	2.08 ± 3.3	5.63 ± 3.98	acute
T = 4.1, df = 23, P = 0.001		T = 4.938, df = 23, P = 0.001		Pair *t*-test
5.83 ± 4.88	3.66 ± 3.7	1.94 ± 3.17	5.78 ± 4.33	delayed
T = 4.28, df = 23, P = 0.001		T = 3.798, df = 23, P = 0.001		Pair *t*-test

mentioned that this type of scale has never been applied in Iran. Therefore, two translators translated the original questioner distinctively. Then, the back translation method was applied to justify the validity of the translated questionnaire. Furthermore, the content validity index (CVI) was determined by asking 10 faculty members of Tehran University of Medical Sciences. In total, the CVI of the questionnaire was 0.92. Moreover, the reliability of the questionnaire was determined using the internal consistency method. Twenty patients undergoing the chemotherapy were invited to fill in the questionnaire and determine its reliability. The Cronbach's alpha coefficient was 0•96.

2.4. Ethical considerations

The Ethics Committee of Tehran University of Medical Sciences under the code of 92/130/2709 approved the research proposal and corroborated its ethical considerations. Proper permission to use the Moro's standard questionnaire was obtained from the questionnaire owner. In addition, permission was obtained from the hospital directors to enter the research zones. All patients were informed about the study's objective and method. They were informed that their participation in the study was voluntary and that they could refuse to participate or withdraw from the study at any time without the fear of being penalized. Moreover, they were reassured that their responses would be kept confidential and their identities would be completely protected. Finally, informed consent was obtained from the patients who willingly agreed to participate in the study. This research was registered at Iran Clinical Trials Center under the code of IRCT2013120415649N1 was registered.

2.4.1. Data collection and analysis

The response rate was 100%. The statistical analysis used was SPSS 11.5 (SPSS, Chicago, IL, USA). Descriptive statistics (e.g. frequencies and percentages) and inferential statistics (independent *t*-test and pair *t*-test) were used to analyze the data; P < 0.05 denoted a statistical significance.

3. Results

The mean and the standard deviation of the subjects' age was 46.02 ± 7.23 (range: 32–65 years old). Most of the (87.5%) subjects were married and (75%) were housewives. Only 25% of patients had information about acupressure among which 85.4% of the patients believed in its usefulness. Among these subjects, only 6.4% were dissatisfied with acupressure while 87.2% recommended it to others.

The results about the intensity of acute and delayed nausea in both groups (A and B) which received acupressure, showed decreased nausea in the experiment group than the control group. Also, pair *t*-test indicated a significant difference between the study groups ($p < 0•001$) (Table 1).

The frequency of nausea in acute and delayed period in both groups (A and B) which received acupressure, showed decreased frequency of nausea in the experiment group than the control group. Also, pair *t*-test indicated a significant difference between the study groups ($p < 0•001$) except in acute period of B group which failed to show significant differences (P < 0.07) (Table 2).

The results of the intensity of acute vomiting in both groups (A and B) which received acupressure, showed increased intensity in the experimental group than the control group. Pair *t*-test indicated no significant differences between the study groups ($p > 0.005$). The results showed that intensity of delay vomiting in both groups (A and B) showed decreased intensity in the experimental group than the control group. Pair *t*-test indicated significant differences between the study groups ($p < 0.005$) (Table 3).

The frequency of vomiting in acute period in both groups (A and B) showed increased frequency of vomiting in the experiment group than the control group. Pair *t*-test indicated a significant difference only between the B groups ($p < 0•05$). The results of frequency of vomiting in delayed period in both groups (A and B), which received acupressure, showed decreased frequency of vomiting in the experiment group than the control group. Pair *t*-test indicated a significant difference only between the B groups ($p < 0•05$) (Table 4).

4. Discussion

The findings of this research indicated that the number and the intensity of nausea in the acute and delayed phases in the acupressure group were significantly lower than the control group. In this regard, Yeh et al. their pilot study and stated that administering AA on children suffering from blood cancer led to a significant decrease in the number and intensity of nausea at its acute and delayed phases [16]. In contrast, in a study on the effect of AA on

Table 2
Frequency of nausea in acute and delayed period in group A and B.

Group B		Group A		The frequency of nausea (mean ± SD)
Second period chemotherapy (control)	First period chemotherapy (AA)	Second period chemotherapy (AA)	First period chemotherapy (control)	
6.85 ± 7.25	3.54 ± 5.31	1.85 ± 3.1	5.79 ± 6.4	acute
T = 1.88, df = 23, P = 0.07		T = 4.31, df = 23, P = 0.001		Pair *t*-test
5.65 ± 7.48	3.17 ± 3.73	2.06 ± 3.74	5.76 ± 5.29	delayed
T = 2.565, df = 23, P = 0.017		T = 3.195, df = 23, P = 0.004		Pair *t*-test

Table 3
Intensity of vomiting in acute and delayed period in group A and B.

Group B		Group A		Intensity of vomiting (mean ± SD)
Second period chemotherapy (control)	First period chemotherapy (AA)	Second period chemotherapy (AA)	First period chemotherapy (control)	
3.71 ± 3.24	2.29 ± 4.71	0.79 ± 2.15	1.04 ± 1.71	acute
T = 1.699. df = 23, P = 0.1		T = 0.755, df = 23, P = 0.45		Pair *t*-test
2.39 ± 2.49	0.86 ± 1.48	0.17 ± 0.64	0.82 ± 1.97	delayed
T = 3.496, df = 23, P = 0.002		T = 2.25, df = 23, P = 0.034		Pair *t*-test

Table 4
Frequency of vomiting in acute and delayed period in group A and B.

Group B		Group A		The frequency of vomiting (mean ± SD)
Second period chemotherapy (control)	First period chemotherapy (AA)	Second period chemotherapy (AA)	First period chemotherapy (control)	
2.06 ± 2.06	2.08 ± 5.29	0.54 ± 1.49	0.79 ± 1.33	acute
T = 0.021, df = 23, P = 0.021		T = 1.152, df = 23, P = 0.261		Pair *t*-test
1.83 ± 2.36	0.59 ± 1.06	0.14 ± 0.53	0.59 ± 1.63	delayed
T = 3.229, df = 23, P = 0.003		T = 1.96, df = 23, P = 0.06		Pair *t*-test

nausea and vomiting during the first trimester of pregnancy, Puangsricharem et al. stated that using AA cannot reduce the number and the intensity of nausea and vomiting during pregnancy [21]. This could be due to the different nature of the problem, the AA points and also the seeds used in this therapeutic method.

The results of this research indicated that the number and the intensity of vomiting were significantly lower among the patients receiving AA than the control group. Therefore, applying AA on the aforementioned points had a good effect on controlling vomiting. These results were congruous with Yeh's study. However, in Taspinar's study which used acupressure on point P6 by using C-band for patients suffering from cancer, the number and the intensity of vomiting had been reduced but it was not statistically significant [9].

The present study was carried out on female patients suffering from BC who were receiving chemotherapy in one day. Nonetheless, it is suggested that more comprehensive studies be conducted in future patients suffering from other kinds of cancer and also those patients suffering from cancer and receiving chemotherapy within several days which must have a more varied nature in their research conditions.

5. Conclusion

Based on the results of the present research, it can be stated that using AA in recommended points alongside other medical therapies could relieve chemotherapy-induced nausea and vomiting without producing any side effects. Hence, we can improve patients' condition and also minimize the side effects of chemotherapy by providing all necessary educational programs and facilities for teaching how to administer acupressure by nurses in clinical places.

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Conflict of interest

No conflict of interest has been declared by the authors.

Authors' contributions

Mohammad Eghbali: Study design, Data collection and analysis, Manuscript writing.

Shokoh Varaei: Study design, Data collection and analysis, Manuscript writing.

Seydeh Fatemeh Jalalinia: Study design, Manuscript writing.

Mojgan Alam Samimi: Study design, Technical and material support.

Kiarash Sa'atchi: Study design, Technical and material support.

Mir Saeed Yekaninejad: Data analysis, Technical and material support.

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