Acupressure for Chemotherapy-Induced Nausea and Vomiting: A Randomized Clinical Trial

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Purpose/Objectives: To compare differences in chemotherapy-induced nausea and vomiting (CINV) among three groups of women (acupressure, placebo acupressure, and usual care) undergoing chemotherapy for breast cancer.

Design: A multicenter, longitudinal, randomized clinical trial throughout one cycle of chemotherapy.

Setting: Ten community clinical oncology programs associated with the University of Texas M.D. Anderson Cancer Center and nine independent sites located throughout the United States.

Sample: 160 women who were beginning their second or third cycle of chemotherapy for breast cancer treatment and had moderate nausea intensity scores with their previous cycles.

Methods: Subjects were randomized to one of three groups: acupressure to P6 point (active), acupressure to SI3 point (placebo), or usual care only. Subjects in the acupressure group were taught to apply an acupressure wrist device by research assistants who were unaware of the active acupressure point. All subjects completed a daily log for 21 days containing measures of nausea and vomiting and recording methods (including antiemetics and acupressure) used to control these symptoms.

Main Research Variables: Acute and delayed nausea and vomiting.

Results: No significant differences existed in the demographic, disease, or treatment variables among the treatment groups. No significant differences were found in acute nausea or emesis by treatment group. With delayed nausea and vomiting, the acupressure group had a statistically significant reduction in the amount of vomiting and the intensity of nausea over time when compared with the placebo and usual-care groups. No significant differences were found between the placebo and usual-care groups in delayed nausea or vomiting.

Conclusions: Acupressure at the P6 point is a value-added technique in addition to pharmaceutical management for women undergoing treatment for breast cancer to reduce the amount and intensity of delayed CINV.

Implications for Nursing: Acupressure is a safe and effective tool for managing delayed CINV and should be offered to women undergoing chemotherapy for breast cancer.

Key Points . . .

- Nausea, especially delayed nausea, continues to be a problem for many women undergoing chemotherapy for breast cancer.
- The amount and intensity of nausea are greater among younger women.
- A numeric rating scale is an appropriate daily measure of delayed nausea.

In 2007, an estimated 178,480 women in the United States are expected to be diagnosed with breast cancer (American Cancer Society, 2007). Many women are treated with moderate to highly emetogenic chemotherapy, including doxorubicin and cyclophosphamide with or without 5-fluorouracil. Despite recent pharmaceutical advances in the prevention and treatment of chemotherapy-induced nausea and vomiting (CINV), many patients continue to experience significant delayed nausea and some vomiting. Nausea and vomiting have been identified as contributing to patients' reluctance to begin chemotherapy and may result in the discontinuation of potentially effective treatment strategies (Carr et al., 1985; Dibble, Casey, Nussey, Israel, & Luce, 2004; Dibble, Israel, Nussey, Casey, & Luce, 2003; Rhodes & McDaniel, 1997).

Small studies of acupressure (Dibble, Chapman, Mack, & Shih, 2000; Dundee & Yang, 1990; Stannard, 1989) have suggested that pressure on the *nei guan* (P6) points may be an effective method to reduce CINV in women undergoing chemotherapy. Some of the studies were cited in a recent Cochrane review (Ezzo et al., 2006) that supported the use of acupressure at P6 for nausea control.

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Acupressure is noninvasive pressure applied by the thumbs, fingers, and hands on the surface of the skin at key points (active acupressure). The mechanism of acupressure is based on a theory that is very different from Western medicine (Craze & Fou, 1998). Traditional Chinese medicine, developed thousands of years ago, and recorded acupuncture texts written more than 2,500 years ago are based on the belief that the body has a system of meridians through which energy (*Qi*) flows (Cohen & Doner, 1996). Symptoms such as nausea are a result of deficiency of *Qi,* stagnation (excess) of *Qi,* or disharmony of the *Qi* of the spleen and stomach. The goal of Chinese medicine is to restore the body to a state of energy balance. Acupressure is one technique that has been used to achieve that goal (Gottlieb, 1995). Acupressure devices (i.e., wrist bands, travel bands, acupressure bands) have been developed to provide passive acupressure on P6. Acupressure can be administered by healthcare providers, family members, or patients themselves (Gottlieb; Porkert & Ullman, 1988) and does not involve puncture of the skin.

Because CINV continues to be problematic for women undergoing chemotherapy and no large trials have been performed to determine the utility of digital acupressure therapy in women being treated for breast cancer, the specific aim of the present randomized clinical trial was to compare the effects of acupressure on the CINV experience among three groups of women undergoing moderate to highly emetogenic chemotherapy for breast cancer. The groups were defined as those receiving (a) active acupressure via digital pressure on the *nei guan* points (P6), (b) placebo acupressure via digital pressure on the *hou xi* points (SI3), and (c) usual care only. The differences in anxiety and functional status among group participants also were measured.

Methods

The design for the current study was a multicenter, longitudinal randomized clinical trial throughout one cycle of chemotherapy. The settings included 10 community clinical oncology programs associated with the University of Texas M.D. Anderson Cancer Center in Houston, TX, and nine independent sites located throughout the United States. The inclusion criteria were women who were receiving cyclophosphamide with or without 5-fluorouracil, doxorubicin with paclitaxel or docetaxel, or 5-fluorouracil, epirubicin, and cyclophosphamide for the treatment of breast cancer; had a nausea intensity score with previous chemotherapy of at least 3 (moderate) on the Morrow Assessment of Nausea and Emesis measuring the worst nausea; were beginning their second or third cycle of chemotherapy; had the ability to communicate (verbally and in writing) in English; and were willing to participate in the study. Figure 1 details the induction and randomization schema.

Instruments

A **patient information questionnaire** was used to collect demographic information upon entry into the study, including age, gender, marital status, ethnicity, employment status, income, and nausea history. A **disease and treatment questionnaire** was used to record information from the medical record, including diagnostic information, treatment regimen, chemotherapy dosages, and antiemetics ordered for use at home and in the chemotherapy site.

A **daily log** consisted of the three-item nausea experience subscale of the Rhodes Index of Nausea (RIN) and the one item from the vomiting subscale from Rhodes Index of Nausea, Vomiting, and Retching. The scale has established reliability and validity (Rhodes & McDaniel, 1997; Rhodes, Watson, & Johnson, 1984; Rhodes, Watson, Johnson, Madsen, & Beck, 1987). Items from the subscales were summed, and subscale scores could range from 0–12, with a higher number reflecting a more severe nausea experience. In addition, nausea intensity was rated using a descriptive, numeric rating scale (NRS) ranging from 0 (no nausea) to 10 (worst nausea imaginable). Participants also were asked to rate their activities (functional status) over the previous 24 hours using a descriptive NRS ranging from 0 (none) to 10 (all).

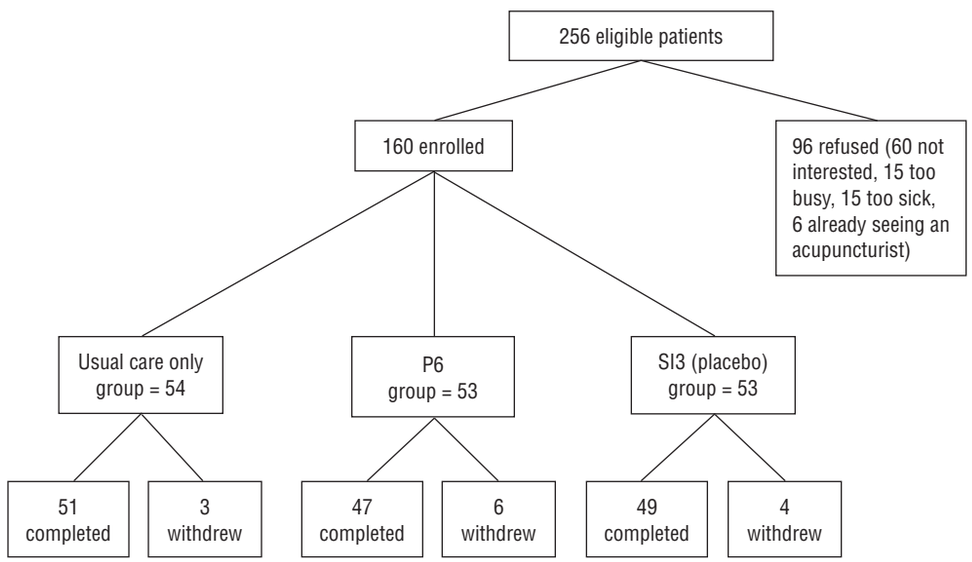

Figure 1. Randomization Schema

Self-ratings were done on a daily basis, prior to bedtime. The correlations between the three-item RIN and the single-item NRS were from 0.85–0.95 for every measurement. The reliability of the RIN was 0.92 for the sample. The daily log also provided a place for each person to record any interventions used for nausea and vomiting control, as well as how often acupressure was used to control nausea (for women in the acupressure groups).

The **State-Trait Anxiety Inventory** of the State Anxiety Scale developed by Spielberger (1983) is a widely used anxiety scale in the United States (Naughton, Shumaker, Anderson, & Czaijkowski, 1996). The State Anxiety Scale contains 20 items scored on four-point scales measuring apprehension, tension, and nervousness according to how the responder feels at a particular moment in time. State anxiety is defined as an individual's transitory emotional responses to a stressful situation such as the administration of chemotherapy. To score the instrument, the responses are summed. Higher scores indicate more state anxiety (Spielberger). Estimates of the alpha coefficient of internal consistency have ranged from 0.86–0.92 (Spielberger). The validity evidence for the State Anxiety Scale is quite strong and shows discrimination in severity levels (Naughton et al.). The reliability was 0.95 in the current study's sample.

Acupressure Intervention

The acupressure treatment for nausea consisted of applying digital pressure to one of the *nei guan* points (P6) located on both forearms (see Figure 2) using the thumb of the opposite hand. If the woman desired, ink marks were applied to her arms to make the P6 points easier to locate. The points are held with a depth of pressure described by the recipient as comfortable for a maximum of three minutes (Gach, 1990). Nausea can make the acupressure point at P6 tender to the touch. When the point is no longer tender, the treatment is complete (i.e., the point has been released). Sometimes a muscle twitch, a rhythmic throb, a spontaneous yawn, or deep sigh accompanies the release. If the release happens prior to the three-minute mark, the participant may move on to the other point or continue what she was doing prior to experiencing nausea. Participants were instructed to find a quiet place each morning to perform the acupressure treatment to both P6 points sequentially as either treatment or practice. During the day, participants in the acupressure groups were encouraged to use digital acupressure to one of the points whenever nausea occurred regardless of where they were. Each acupressure session should take approximately six minutes in the morning and three minutes each during the rest of the day, depending on the intensity of the nausea.

Participants in the placebo group received the same instruction. An active placebo point was chosen because the researchers were concerned that the teaching and experience of acupressure would not be similar with a sham (nonactive) point. The *hou xi* point (SI3, a point on the ulnar side of the hand), was chosen because activation of that hand point would not affect nausea treatment and the point is close, but not too close, to the active P6 point.

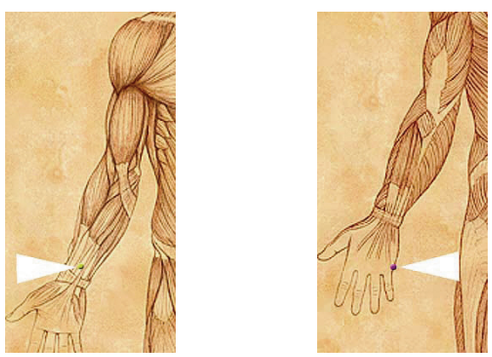

Figure 2. Acupressure Points Used in This Study

Note. Illustrations courtesy of Acuxo. Reprinted with permission.

Procedures

Each institution that participated in the study received approval for the protocol from its institutional review board. Potential participants were approached about the study by research assistants, their nurses, or their physicians. Each of the research assistants and nurses acting as research assistants received at least two hours of training in the study protocol. They also had on-site access to a teaching video about the protocol.

After providing consent, each woman completed the baseline data collection, which included the demographic and anxiety measures. Participants were randomized to receive acupressure via digital pressure to P6 plus usual care, placebo digital acupressure to SI3 plus usual care, or usual care only. One of the research assistants taught participants in the acupressure groups how to use the actual or placebo acupressure points. Participants were taught acupressure in a private room or an examination room immediately prior to receiving chemotherapy. The researchers endeavored to keep the research assistant masked as to the active point. Patients were coached until they could satisfactorily demonstrate to the research assistant how to find and apply acupressure to each point (active or placebo).

The women in the acupressure groups completed a daily log about acupressure usage as well as medications taken to control their nausea. The daily log was similar to the one that the usual-care group used. All participants were asked to record any interventions they attempted in an effort to control nausea and were instructed to complete the daily log each evening for approximately three weeks until their next cycle of chemotherapy. All participants were called or seen on day 8 of the chemotherapy cycle so that any questions could be answered, they could be encouraged to complete the log, and they could be coached (i.e., the acupressure groups) about the importance of their participation in the study. A few days before the next cycle of chemotherapy, a research assistant called all participants to remind them to bring their daily logs to the appointment. At the appointment, a research assistant collected the daily logs and asked patients to complete an exit questionnaire, which included the anxiety measure. The total time required for the participants' study involvement was approximately four hours over one month. All participants received reimbursement for parking during the extra time required for study participation.

All women received antiemetic therapy to be used at home as prescribed by their physicians. They were asked to record what they actually took on a daily basis in the log. Although the usual treatment of nausea varies by patient, practitioner,

geographic area, and insurance coverage, the added value of acupressure was studied in the context of usual clinical nausea care.

Data Analysis

SPSS for Windows™ release 13.0.1 (SPSS Inc.) and SAS PROC GLIMMIX™ version 9.1.3 (SAS Institute, Inc.) software were used for data analysis. Data were double entered into SPSS, and discrepancies between files were resolved to ensure accuracy of the data entered. Descriptive statistics were generated for sample characteristics and other variables of interest. Analyses were performed based on the "intent to treat" philosophy (Piantadosi, 2005). Age was dichotomized to younger than 55 years and 55 years or older for some analyses. HLM 6™ version 6.02 (Scientific Software International) software was used to confirm the results from some SAS software analyses. Hierarchical generalized linear mixed-models analyses (Goldstein, 2003; Raudenbush & Bryk, 2002) were conducted with SAS PROC GLIMMIX to predict changes in outcomes over the 10-day post-treatment period. Multilevel Poisson regressions with overdispersion were used to examine quantitative outcomes when the distribution of the data clearly was significantly skewed. Multilevel logistic regression was used to examine binary outcomes, adjusting for overdispersion because of the relatively low incidence of the target outcomes. For both methods of analysis, random intercept models were estimated with subject-specific, maximum pseudo-likelihood (SAS Institute, 2004). Mean substitution and last value carried forward were used for missing data. Last value carried forward was used only when participants clearly experienced no further nausea or vomiting. When the women felt better, missing data became problematic.

Results

Demographics

The participants (N = 160) were, on average, aged 49.3 years (SD = 9.4), Caucasian (79%), married or partnered (74%), employed (51%), born U.S. citizens (94%), heterosexual (95%), and living with someone (92%). The average duration of education for the women was 14.4 years (SD = 2.6); 70% had more than a high school education. The average body mass index was 27.5 kg/m^2 (SD = 5.9 kg/m^2). Eighty-one percent of the participants experienced at least some degree of morning sickness with a pregnancy, 36% had a history of seasickness, 34% had a history of being carsick, and 28% had a history of nausea with stress. No significant differences in the demographic variables were found by group assignment (see Table 1).

No significant differences existed among the groups in the disease and treatment variables (see Table 2). Most (76%) of the women were receiving an anthracycline and cyclophosphamide as their chemotherapy regimen. The average dose of doxorubicin (n = 145) was 115 mg, and the average dose of cyclophosphamide (n = 154) was 1,121 mg. The most common IV antiemetics given during chemotherapy administration were dexamethasone (80%), ondansetron (49%), granisetron (24%), and dolasetron (17%). A variety of combinations and dosages of the medications were given before and following chemotherapy. The most common antiemetics ordered for home use were prochlorperazine (70%), and 74% had at least one of the selective antagonists of the serotonin receptor subtype, 5-HT$_3$, ordered. Fifty-five different home pharmaceutical regimens were taken by the trial participants. Nonpharmacologic interventions included exercise, fresh air,

Table 1. Demographics by Group Assignment

	Usual Care Only (N = 54)		P6 Intervention (N = 53)		SI3 Intervention (N = 53)	
Characteristic	$\bar{X}$	**SD**	$\bar{X}$	**SD**	$\bar{X}$	**SD**
Age (years)	48.8	9.8	49.3	10.6	49.9	8.0
Education (years)	14.3	2.7	14.6	2.7	14.4	2.3
Body mass index (kg/m^2)	27.2	6.0	27.3	5.2	28.1	6.4
Characteristic	**n**	**%**	**n**	**%**	**n**	**%**
Employment						
Employed	28	53	21	42	29	59
Unemployed	25	47	29	58	20	41
Ethnicity						
Caucasian	40	74	43	81	43	81
Other	14	26	10	19	10	19
Born U.S. citizen	51	96	47	92	47	92
Relationship status						
Married or partnered	35	66	38	74	41	82
Other	18	34	13	26	9	18
Heterosexual orientation	46	94	49	94	46	96
Lives alone	5	9	4	8	4	8
History of car sickness	15	28	18	35	20	39
History of seasickness	16	30	18	35	23	45
History of morning sickness (N = 137)	36	80	37	84	38	79
History of nausea with stress	17	32	9	17	18	35

Note. Participants did not answer all questions, resulting in missing data. Percentages are based on the number of actual responses.

Table 2. Treatment Characteristics by Group Assignment

	Usual Care Only (N = 54)		P6 Intervention (N = 53)		SI3 Intervention (N = 53)	
Characteristic	$\bar{X}$	**SD**	$\bar{X}$	**SD**	$\bar{X}$	**SD**
Number of positive nodes	3.04	5.9	3.42	6.2	2.77	3.7
Dose of cyclophosphamide (mg)	1,043.00	456.0	1,216.00	729.0	1,102.00	424.0
Dose of doxorubicin (mg)	108.00	43.0	127.00	76.0	113.00	44.0
Characteristic	**n**	**%**	**n**	**%**	**n**	**%**
Breast surgery						
Lumpectomy	27	51	25	49	26	50
Mastectomy	18	34	14	28	19	36
Lumpectomy and mastectomy	4	8	4	8	2	4
Bilateral mastectomy	4	8	8	16	5	10
Diagnosis						
Ductal	47	89	42	82	42	81
Others	6	11	9	18	10	19
Nodal surgery						
None	10	19	12	24	10	19
Axillary node dissection	30	57	25	49	27	52
Sentinel	9	17	9	18	9	17
Both	4	8	5	10	6	12
Radiation therapy						
No	14	29	18	39	10	21
Yes	7	14	4	9	7	15
Planned after chemotherapy	28	57	24	52	30	64
Chemotherapy						
Cyclophosphamide and anthracycline	40	76	40	78	39	74
Other combinations	13	24	11	22	14	26

Note. Participants did not answer all questions, resulting in missing data. Percentages are based on the number of actual responses.

visualization, dry toast, crackers, peppermint tea, ginger tea, a spoonful of honey, avoiding smells, aromatherapy, avoiding stress, prayer, and just enduring.

Acute Nausea and Vomiting: Day of Chemotherapy, Study Day 1

In the initial hours following chemotherapy administration, emesis was documented in the logs of less than 10% (n = 12) of the sample (n = 124). Six women vomited three times or more. Unfortunately, 36 women did not complete their logs and the reason for the missing data is unknown. No significant differences in acute emesis were found by age ($\chi^2 = 1.10$, $p = 0.29$) or treatment group ($\chi^2 = 0.67$, $p = 0.71$). Acute nausea occurred more frequently, with more than 75% of the women (n = 94) reporting some nausea, but no significant difference in the incidence (dichotomous variable) of nausea was found by treatment group (RIN: $\chi^2 = 1.19$, $p = 0.55$; NRS: $\chi^2 = 1.23$, $p = 0.55$). A significant difference did exist for patient age (RIN: $\chi^2 = 12.87$, $p < 0.0005$; NRS: $\chi^2 = 13.61$, $p < 0.0005$), with younger women reporting more acute nausea. Further analyses indicated that the intensity of nausea ranged from 1–10 on the NRS ($\bar{X} = 4.53$, SD = 2.70) and 1–12 on the RIN ($\bar{X} = 5.54$, SD = 2.93). The two measures correlated significantly at 0.922. A significant relationship was found between the intensity of acute nausea and age using both of the rating scales (RIN: $r = -0.34$, $p < 0.001$; NRS: $r = -0.28$, $p = 0.002$), with younger women reporting a greater intensity of nausea. However, no significant difference existed in the intensity of acute nausea by treatment group using both rating scales (RIN: $F = 0.607$, $p = 0.547$; NRS: $F = 0.550$, $p = 0.579$). After controlling for age, no significant differences were found in the intensity of acute nausea using either rating scale (RIN: $F = 0.550$, $p = 0.578$; NRS: $F = 0.174$, $p = 0.841$). Baseline state anxiety was not significantly associated with the incidence or intensity of acute nausea or vomiting. A history of morning sickness, car sickness, or seasickness was not significantly associated with acute nausea or vomiting. A history of nausea with stress was significantly associated with acute nausea ($\chi^2 = 6.26$, $p = 0.012$) but not acute vomiting ($p = 0.676$). Acute nausea was significantly associated with acute vomiting (Spearman rank correlations: RIN: $r_s = 0.31$, $p < 0.0005$; NRS: $r_s = 0.32$, $p < 0.0005$).

Delayed Emesis: Study Days 2–11

For 58% of the sample, delayed emesis did not occur. Two women reported that they experienced daily emesis for the 10-day measurement period. Of the three patients who took aprepitant, one had no vomiting, one had one episode on the sixth day, and one vomited every day for 10 days. Of the 22 women who vomited on a single day after their chemotherapy, 9 (22%) experienced emesis the day after chemotherapy administration, 2 (9%) had their first and only emesis on day 7, and the remaining 11 varied in their patterns of vomiting. Taking dexamethasone (43%) or a serotonin ($5\text{-}HT_3$) antagonist (dolasetron, granisetron, or ondansetron) (74%) at home was not associated with delayed vomiting. A significant relationship

existed between delayed vomiting and age (t = 3.22, p = 0.002), with younger women reporting more vomiting.

An initial analysis of any (versus no) emesis in the 10 days following treatment showed that vomiting was reported on 11% of the days. Emesis was reported on 143 of the 1,318 patient days. All women reported a decline in emesis across the 10 days after chemotherapy (t = –6.78, p < 0.0001). Of particular interest was whether women who used acupressure reported a greater decline in their rate of emesis compared to the placebo or usual-care groups. Differences among the groups for changes in emesis across time were examined with multilevel logistic regression. The results showed that the decline in the incidence of emesis was greater for the P6 acupressure group than either the placebo group (t = 3.13, p = 0.002, odds ratio [OR] = 1.3) or the usual-care group (t = 4.81, p < 0.0001, OR = 1.4).

The incidence of emesis declined differently for younger (< 55 years) compared to older women (≥ 55 years), with younger women reporting emesis more frequently immediately following treatment and a steeper decline in emesis over time (t = 3.37, p = 0.0008, OR = 1.3). The older women reported a lower incidence of emesis over the 10 days. The age-group difference in emesis across time also differed significantly for the usual-care group, compared to the P6 acupressure group. Younger women in the usual-care group differed from younger women in the P6 acupressure group in delayed vomiting, and the difference was greater than the analogous comparison for older women (three-way interaction, group by age by time; t = 4.74, p < 0.0001, OR = 1.5). The estimated decline in the incidence of emesis across time—by group and age group—can be seen in Figure 3.

Delayed Nausea: Study Days 2–11

Ninety-eight percent of the women in the study experienced delayed nausea. Fifty-one percent reported that their nausea had resolved by the seventh day after their chemotherapy, and 29% still reported some nausea by the 10th day after chemotherapy. Figure 4 provides a more complete description of the reported delayed nausea over time. Baseline anxiety was significantly associated with the intensity of delayed nausea for the first four days after chemotherapy (r = 0.19–0.22, p < 0.03); more anxiety at baseline was associated with more delayed nausea. Functional status was significantly negatively associated with the intensity of nausea each day (r = –0.393 to –0.487, p < 0.001); those with more delayed nausea reported lower functional status.

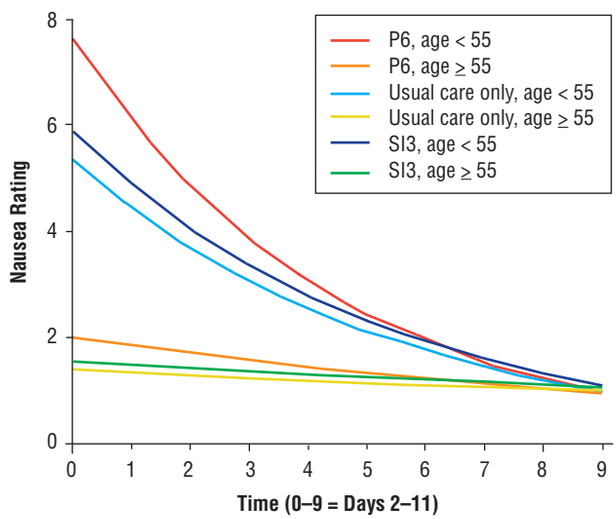

Figure 3. Hierarchical Generalized Linear Model Logistic Regression With Overdispersion: Delayed Emesis (Binary) on Time by Group by Age

Delayed nausea was evaluated with multilevel Poisson regression by examining change from days 2–11. Reported declines in nausea were greater for women in the acupressure group than for the women in the usual-care group on RIN scores (t = 2.77, p < 0.006, incidence rate ratio [IRR] = 1.05) and nausea NRS (t = 2.74, p = 0.006, IRR = 1.05). Change across time did not differ between the acupressure and placebo groups for either nausea measure. Younger women reported steeper declines in nausea than older women. The estimates for both nausea scores for older women were lower across all 10 days, whereas the estimated initial ratings for younger women were higher and then decreased rapidly over time. The difference between younger and older women was greater for the acupressure group compared with the placebo and usual-care groups, with the decrease in estimated nausea ratings being steeper for the younger women in the acupressure group (RIN: acupressure versus usual care, t = 4.56, p < 0.0001, IRR = 1.11; RIN acupressure versus placebo, t = 2.68, p = 0.008, IRR = 1.07; nausea NRS: acupressure versus usual care, t = 4.43, p < 0.0001, IRR = 1.11; nausea NRS: acupressure versus placebo, t = 2.14, p = 0.03, IRR = 1.06). The pattern of change for the nausea NRS is shown in Figure 5.

Patient Comments

Comments were solicited from patients about their participation in the study. For the P6 acupressure group, comments included the following. "No medication all day! Used acupressure." Nausea "only seems to come on when my stomach is empty. The acupressure helps." "Acupressure seems to help after the third day after treatment. Not too much within the first few days when nausea is right after chemo." The members of the placebo (SI3) acupressure group recorded that acupressure "didn't necessarily help me, but maybe it would help someone else" and "aromatherapy helped me much more than acupressure (peppermint oil)." By day 5, one woman recorded "acupressure no help yet." A woman in the usual-care group lamented a few days after her chemotherapy that "I wish I was in one of the 'other' groups in this test!" Another woman was so frustrated by being in the control group that she learned about P6 and started using acupressure for her next cycle of chemotherapy. She recorded that "acupressure can be extremely effective in reducing chemo-induced nausea."

Discussion

This is the first comprehensive U.S. study of digital acupressure at P6 over 10 days following moderate to highly emetogenic chemotherapy (day 1 [acute], days 2–11 [delayed]). The data suggest that digital acupressure at P6 is a useful adjunct to pharmaceutical interventions for delayed nausea and vomiting. Specifically, acupressure may hasten time to recovery. Many women recorded the most useful effects when nausea was mild but noted that the technique was helpful in addition to medications even when the nausea was severe. The

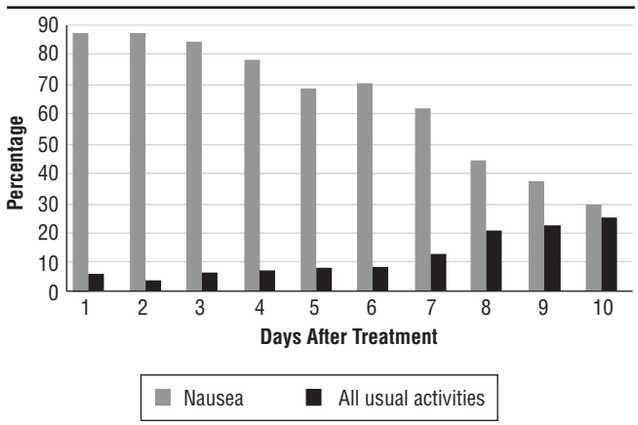

Figure 4. Delayed Nausea and Activities Over Time

present study's findings confirm the results of two small-scale digital acupressure studies of the P6 point for chemotherapy-induced nausea. The first was the pilot study for the current trial (Dibble et al., 2000), and the second treated 40 patients in Korea with gastric cancer who were undergoing inpatient chemotherapy (Shin, Kim, Shin, & Juon, 2004). Neither of the previous studies included a placebo acupressure group. The use of a placebo acupressure point as one group in the current study strengthens the hypothesis that the results are not merely because of a placebo effect. In the present study, self-delivered placebo acupressure was not significantly different from the usual-care group in controlling CINV. The participants were unable to convince themselves that the placebo acupressure worked to control their nausea over time as their comments demonstrated.

The design of the current study helps to answer the question about the placebo response over time. No statistically significant differences were found between the placebo acupressure group and the usual-care group over time. The data suggest that future researchers may not need to incur the expense of a three-group design for their studies; a two-group design should be sufficient for examining other types of digital acupressure for symptom management. The results confirm those of Kienle and Kiene (1996), who reported that the extent and frequency of placebo effects as published in most of the literature were "gross exaggerations."

Two other measurement issues have been clearly identified and resolved, to some extent, in the current study—the length of time necessary to follow patients for nausea and how to measure nausea over time. The most common time frame for nausea studies is 120 hours (i.e., five days). However, in this study, 70% of the women still had nausea 120 hours after receiving chemotherapy and 30% had nausea at day 11. Perhaps two weeks of follow-up would be appropriate when future studies examine the effect of an intervention on chemotherapy-induced delayed nausea. If the women in this study are accurate and acupressure works best on mild nausea, measuring nausea for only five days might miss the importance of acupressure effects as an adjunct to pharmaceutical treatments that usually are not ordered beyond five days. The second measurement issue is the recording of the presence and intensity of nausea or vomiting. The Rhodes Index of Nausea, Vomiting, and Retching is a reliable and valid instrument, but it is too lengthy for daily use. The NRS used in the current study was highly correlated and produced the same findings as the RIN. Therefore, the authors would support the use of NRSs for the daily measurement of nausea and vomiting.

Another measurement issue that should be considered for future studies of CINV is the interaction among age, menopausal status, and CINV. In this study's data, the researchers were not able to explore whether the differences in CINV by age were a function of all of the components of aging or just the natural hormonal changes resulting from menopause. Unfortunately, information regarding menopausal status was not collected. Future research should be designed to answer that question.

No study is without limitations, including the current trial. First, the same research assistants and nurses were teaching the use of both acupressure points. Although most of them did not know which point was active for the treatment of nausea, some were quite intent on finding out and did so through the Internet. That issue was true for five patients. The researchers simply asked all women to participate in the trial, and their questions would be answered after the trial. However, seeing patients with nausea and being a patient with unrelieved nausea can and did result in some women breaking the "blind." A few participants had difficulty finding the points consistently, so the intervention dosage varied, and two participants had long fingernails that interfered with performing acupressure. The researchers suggested that the women use the eraser end of a pencil to apply the acupressure. This study should be replicated in future research efforts and conducted with men, children, and women experiencing CINV from other chemotherapeutic agents.

Implications for Oncology Nurses

At least two studies about acupressure have concluded that acupressure is an important adjunct to pharmaceuticals in managing CINV (Dibble et al., 2000; Shin et al., 2004). Those studies as well as the current study suggest that oncology clinicians can include acupressure in their list of options for the management of CINV, especially delayed nausea and

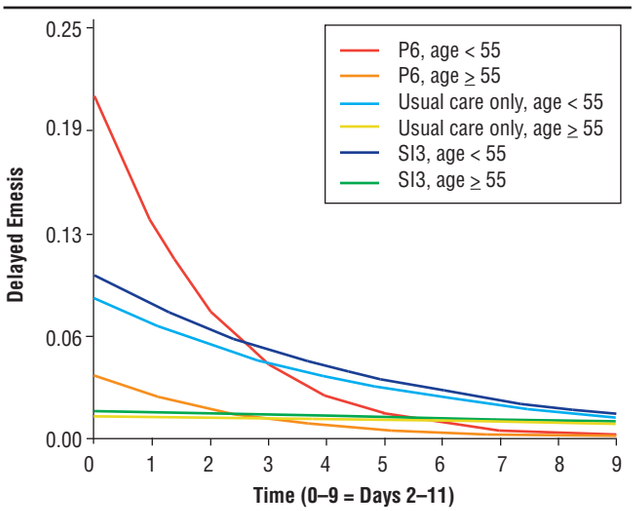

Figure 5. Hierarchical Generalized Linear Model Poisson Regression With Overdispersion: Delayed Nausea on Time by Group by Age

vomiting. Training in the appropriate technique is straightforward and easy to obtain through a Chinese medicine provider, an acupuncturist, or a massage therapist. Internet resources also are available (e.g., www.acuxo.com). CINV still is a significant problem for many patients. Specific recommendations provided by oncology nurses are not only useful but also are very appreciated by patients.

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