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## **The Effect of Foot Reflexology on Pain in Patients with Metastatic Cancer**

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Thirty-six oncology inpatients participated in this third pilot study investigating the effects of foot reflexology in which equianalgesic dosing was calculated. Foot reflexology was found to have a positive immediate effect for patients with metastatic cancer who report pain, although there was no statistically significant effect at 3 hours after intervention or at 24 hours after intervention. Further study is suggested for foot reflexology delivered by family in the homes for management of cancer pain.

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**A** PPROXIMATELY 75% OF patients with all types of advanced cancer experience pain (Pargeon & Hailey, 1999; U.S. Department of Health and Human Services [USDHHS], 1994), and there is evidence that many patients' pain does not respond to current treatments (Bonica, 1990; USDHHS, 1994; Wyatt & Friedman, 1998). More than two thirds of Americans with chronic pain are now using complementary and alternative thera-

pies (American Pain Foundation, 2002), and recent research suggests that these therapies have positive results on symptoms in oncology patients (Okie, 2000). However, more research is needed to determine the most effective integration of complementary and alternative therapies into patient care (Bender, Kramer, & Miaskowski, 2002).

The study reported here looked at the effect of the complementary and alternative therapy of reflexology. Although many studies of reflexology have been conducted in the past 2 decades (Ashkenazi, 1993; Crowther, 1991; Dobbs, 1985; Hang, 1991; Frankel, 1997; Liang, 1996; Marquardt, 2000a; Tiran, 1996), little of the research on reflexology has focused on uncomfortable symptoms (Evans, Nokes, Weaver, Maheson, & Morrell, 1998; Launso, Brendstrup, & Arnberg, 1999; Oleson & Flocco, 1993; Tovey, 2000). Only recently have studies begun examining reflexology's use to reduce pain in cancer patients.

In a study by Stephenson et al. (2000), 23 patients with breast or lung cancer received one 30-minute reflexology treatment and one 30-minute

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interval of standard care in a crossover design. The Visual Analogue Scale for Anxiety and the Short-Form McGill Pain Questionnaire were administered before and after reflexology, and again before and after the 30-minute control condition without reflexology.

Eleven breast cancer patients showed a significantly greater decrease in pain following foot reflexology than following usual care ( $M = -0.41$ ,  $SD = 0.71$ ,  $p = .048$ ). In addition, there was a significant decrease in anxiety following foot reflexology in both breast cancer patients ( $n = 13$ ,  $M = -17.38$ ,  $SD = 21.29$ ,  $p = .01$ ) and lung cancer patients ( $n = 10$ ,  $M = -27.6$ ,  $SD = 25.49$ ,  $p = .02$ ).

Stephenson et al. (2000) also provided evidence that foot reflexology was effective in reducing pain and anxiety, and it could be integrated into standard care. The feet were easily accessed, patients did not need to be turned, sparing them discomfort, and they were not exposed or embarrassed to receive foot reflexology. The 30-minute time of being touched by another individual was viewed as positive by patients. However, the study did not examine the duration of the effects of reflexology.

To examine duration, this study compared the pain experienced by cancer patients receiving foot reflexology and control patients immediately after reflexology and at 3 hours post intervention and 24 hours after intervention. The study also examined factors associated with response to treatment, including belief in treatment effectiveness.

## METHODS

Using an experimental repeated-measures design, a stratified random sample of 36 cancer inpatients in a regional hospital in the southeastern United States (a second study in this area) was enrolled over an 8-month period. Patients were selected from a predetermined random schedule of control or experimental subjects and stratified by scores of low pain, 2-4, or high pain, 5, and above. All patients on an oncology unit with metastasis were included in the study over an 8-month period if they were 21 years of age or older, spoke English, gave informed consent, and reported a score 2 or higher on the 0 to 10 self-report pain scale recommended by Joint Commission on the Accreditation of Healthcare Organizations (JCAHO, 2001). Nine patients (20% of invited patients) declined the opportunity to participate in the study.

Protection of human subjects included the requirement of a medical consultation before the researcher was allowed to seek participation in the study from patients exhibiting any possible symptoms of deep vein thrombosis. Patient information was coded to insure confidentiality and secured in the researcher's locked file cabinet.

Foot reflexology was delivered two times, 24 hours apart, to experimental subjects, by a certified foot reflexologist from the International Institute of Reflexology using the Original Ingham method. Reflexology performed by the reflexologist using the thumb and forefinger to apply pressure to areas on the feet, which correspond to all organs, glands, and body parts, follows the reflexology protocol established by Stephenson for cancer patients (1997). A research assistant (not the intervener) collected the data. Equianalgesic dosing was calculated using the Opioid Converter (DuPen & DuPen, 2000) for analgesics taken by the patients for 3 consecutive days. Demographic data were collected from patients on the initial contact as well as a yes/no response to the statement: "I believe that foot reflexology will help relieve my pain related to cancer." Control patients were offered a 30-minute reflexology session at the conclusion of data collection.

## RESULTS

The major types of cancer among the sample of 19 treatment patients and 17 control patients were lung (36.1%), lymphoma (22.2%), and colorectal (11.1%), with other types comprising 30.6%. The majority of the sample were female (55.6%), Caucasian, (86.1%), and distributed equally between young and older adults (50% 65 years and older), with 12 years or less education (58.3%), and with \$20,000 or more annual income (54.3%).

An analysis of variance of baseline-adjusted post-treatment measurements revealed that pain scores were lower by 2.4 more points in the treatment group than in the control group immediately after intervention ( $F[1,31] = 9.08$ ,  $p < .01$ ). However, adjusting for baseline pain levels, there was no statistically significant effect ( $p = 0.21$ ) at 3 hours after intervention nor significant effect ( $p = 0.14$ ) at 24 hours after intervention.

Among the intervention patients, pain scores were lower 24 hours after the intervention than before the first intervention. The total opioid analgesics being taken 24 hours after the first interven-

tion were 115 mg (parenteral morphine equivalent) more than the opioid analgesics taken before the first intervention (excluding one outlier), and this may have accounted in part for some of the patients' lower pain scores 24 hours after intervention. Examination of prior beliefs concerning the effects of foot reflexology and the immediate effects of foot reflexology showed no significant effects ( $p = .97$ ) (Stephenson, 2002). Most patients did not know about reflexology and had no prior belief that it would relieve their cancer pain.

### DISCUSSION

Although the sample was small, this clinical study suggests that there is an immediate positive effect of foot reflexology for patients with metastatic cancer who report pain. When patients were asked if they would integrate reflexology into their

therapy, their responses were mostly positive. One 70-year-old male patient, who had experienced a day of tests including radiographs, magnetic resonance imaging, and a computerized tomography scan, said that the reflexology intervention was the only "non-insulting thing" that had occurred to his body in the hospital during the entire day.

Because these patients are managed at home most of the time (Coyle, 2003), further research is needed on how foot reflexology can be provided for these patients in the home. Many family members of patients in this study expressed an interest in learning how to provide reflexology for the patient. If the caregivers were trained in reflexology, they could deliver interventions to the patient for pain relief whenever necessary and at no cost. This would also allow for evaluation of the effect of multiple reflexology interventions over time.

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