

Original Article

Massage Therapy for Symptom Control: Outcome Study at a Major Cancer Center

Barrie R. Cassileth, PhD and Andrew J. Vickers, PhD

Integrative Medicine Service (B.R.C., A.J.V.) and Biostatistics Service (A.J.V.), Memorial Sloan-Kettering Cancer Center, New York, New York, USA

Abstract

Massage is increasingly applied to relieve symptoms in patients with cancer. This practice is supported by evidence from small randomized trials. No study has examined massage therapy outcome in a large group of patients. At Memorial Sloan-Kettering Cancer Center, patients report symptom severity pre- and post-massage therapy using 0–10 rating scales of pain, fatigue, stress/anxiety, nausea, depression and “other.” Changes in symptom scores and the modifying effects of patient status (in- or outpatient) and type of massage were analyzed. Over a three-year period, 1,290 patients were treated. Symptom scores were reduced by approximately 50%, even for patients reporting high baseline scores. Outpatients improved about 10% more than inpatients. Benefits persisted, with outpatients experiencing no return toward baseline scores throughout the duration of 48-hour follow-up. These data indicate that massage therapy is associated with substantive improvement in cancer patients’ symptom scores. J Pain Symptom Manage 2004;28:244–249. © 2004 U.S. Cancer Pain Relief Committee. Published by Elsevier Inc. All rights reserved.

Key Words

Massage, cancer, pain, anxiety, depression, nausea, fatigue, clinical trials

Introduction

In the 1940s, Rene A. Spitz learned that foundling home infants, well fed and warm but not held or touched, tended to wither away and die. Of 91 such babies he observed, 27 died in their first year of life, followed by seven more in their second year; in other homes, up to 90 percent died in early infancy. Babies who survived in the institutions were classified as hopeless.^{1,2} Harlow’s studies of monkeys that had been removed from their mothers showed

similar results, plus major dysfunctions as they developed and when they themselves became mothers.³ His major work, “Touching: The Human Significance of the Skin,”⁴ clarified a major message: tactile stimulation is essential to normal development and even to survival.

The use of human touch as an intervention against pain and other problems has great appeal. If effective, it could provide a non-invasive, inexpensive adjunct to the management of pain and other symptoms experienced by patients with major chronic illnesses. Data from related, difficult to control clinical circumstances are promising. Massage therapy, defined as manipulation of soft tissue areas of the body, is offered in clinical settings to assist relaxation, facilitate sleep, and relieve muscular

Address reprint requests to: Barrie R. Cassileth, PhD, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, H13, New York, NY 10021, USA.

Accepted for publication: December 23, 2003.

aches and pains.⁵ It is increasingly used for symptom relief in patients with cancer. Approximately 20% of U.S. cancer patients seek massage therapy,^{6,7} and approximately 70% of U.K. hospices offer it.⁸ Massage is included in treatment guidelines such as those of the National Comprehensive Cancer Network, which recommends consideration of massage for refractory cancer pain.⁹

Research supports such recommendations. Several trials suggest that massage can reduce pain in cancer patients at varying stages of disease.^{10,11} In the largest study to date, 87 hospitalized cancer patients were randomized to massage therapy or to control on a crossover basis. Pain and anxiety scores fell by approximately 40% during massage compared with little or no change during control sessions.¹² Massage therapy was superior to control against anxiety, nausea, fatigue and general well-being in a randomized study of patients awaiting bone marrow transplantation.¹³

Massage has been available systematically at Memorial Sloan-Kettering Cancer Center (MSKCC) since establishment of the Integrative Medicine Service in 1999. Twelve licensed massage therapists treat inpatients and also provide massage therapy at our outpatient facility. Patients who receive integrative medicine therapies record symptom scores before and after treatment as a routine part of clinical management. To avoid bias, staff not associated with the evaluation, rather than therapists, provide cards on which patients complete symptom rating scales. These cards are placed privately by patients in a closed box. Only research staff work with the completed cards. Data from these scores, reported here, shed important light on the management of common and often refractory symptoms experienced by patients with cancer.

Methods

Patients at MSKCC may self-refer to massage therapy or may be referred by a health professional responsible for their care. About 50% of inpatient referrals come from MSKCC nurses; self- and family referrals account for a further 20% and 10%, respectively. Physicians and other health professionals account for the remaining approximately 20%. Outpatient massage therapy is self-referred.

Three variations of massage therapy are available to patients at MSKCC: standard ("Swedish") massage,⁵ light touch massage, and foot massage. A specific type of massage is requested for almost all referrals. Patients receive the requested type of massage approximately three times out of four. The majority of the remaining cases are requests for regular massage in which either light touch or foot massage was given, typically because the practitioner felt that a weak or late-stage patient could not tolerate a regular massage or because the patient was too ill to move into a comfortable position to receive standard massage therapy.

Massage sessions average 20 minutes in length for inpatients and 60 minutes for outpatients. Before and 5–15 minutes after massage therapy, patients are given a 5 × 8 inch card with numerical rating scales for common symptoms: pain, fatigue, stress/anxiety, nausea, depression, and "other." Patients rate each on a 0 ("Not at all bothersome") to 10 ("Extremely bothersome") scale.

Data from symptom cards for massage therapy from April, 2000, when use of the rating scales was initiated, to March, 2003 were analyzed. Combinations of interventions, such as massage and a simultaneous relaxation therapy, were excluded. Comparisons between different types of massage or symptoms were conducted by ANCOVA of the presenting symptom, with baseline score as a covariate. The presenting symptom was defined as that with the highest baseline score. If more than one symptom was scored equally high, the presenting symptom was chosen in the following priority order: pain, depression, anxiety, nausea, fatigue, other. The main analyses concern the initial episode of care. This ensures that each patient is included in the analysis only once. Analyses were conducted by AV using Stata 7 statistical software (Stata Corp., College Station, Texas).

Ethical approval for this retrospective review of clinical data was given by the MSKCC IRB.

Results

Cards were returned for 3,609 episodes of care; post-therapy data were available for 3,359 (93%). Of these, 2,465 (73%) involved care of an MSKCC patient, with smaller numbers for cancer patients from other hospitals (94, 3%),

Table 1
Types of Massage Therapy Received

Therapy	Inpatients n (%)	Outpatients n (%)	Total n (%)
Massage	316 (33)	244 (74)	560 (43)
Light touch massage	69 (7)	21 (6)	90 (7)
Foot massage	536 (56)	49 (15)	585 (45)
More than one therapy	40 (4)	15 (5)	55 (4)
Total	961 (74)	329 (26)	1290 (100)

family members (78, 2%), staff (345, 10%) and members of the public (377, 11%). Data reported below reflect the initial episode of care for the 1,290 different MSKCC patients who provided post-treatment data.

As indicated in Table 1, the most commonly administered touch therapies were standard (Swedish) massage or foot massage, with far fewer patients receiving light touch massage. Fifty-five patients received more than one type of touch therapy during the same session, i.e., some foot massage and some Swedish massage during a single session. Foot massage was predominantly used for inpatients; standard and light touch massage was more equally balanced between in- and outpatients. The most common presenting symptom was anxiety (397, 31%), followed by pain (366, 28%) and fatigue (312, 24%). Fewer than 10% of patients reported greatest distress from depression, nausea or another symptom.

The immediate effects of massage therapy on symptoms are shown in Table 2. Although major improvements in symptom scores are apparent—severity of the presenting symptom was reduced by a mean of 54% (95% C.I. 52%, 56%)—Table 2 may actually underestimate massage effects. Patients did not necessarily experience high levels of all symptoms. Therefore,

the data for each symptom includes a significant number of zero or near zero scores. A patient presenting with depression, for example, may have reported no pain or nausea. For such a patient, no improvement in pain and nausea would be possible, thus diluting the apparent effects of treatment on these symptoms at the group level.

Accordingly, Table 3 includes only data for symptoms rated four or higher at baseline, the traditional threshold for considering a symptom of at least “moderate” severity. The strongest effects were seen for anxiety and the smallest changes for fatigue, although a 43% reduction in fatigue is clinically relevant. There was no evidence of an attenuation of effect at high baseline scores. For example, an approximate 45% improvement in pain scores was seen even in the 244 patients with baseline scores of seven or above, and in the case of anxiety, improvements were always close to 60%, regardless of baseline score.

After adjusting for baseline score, outpatients reported symptom scores 0.56 points lower (95% C.I. 0.27, 0.85; $P = 0.0002$) than inpatients, equivalent to an approximate 10% greater improvement. Effects by type of massage are shown in Table 4. Adjusting for in- or outpatient and baseline score, patients receiving Swedish and light touch massage had superior outcomes to those receiving foot massage (0.32 points; 95% C.I. 0.03, 0.60 $P = 0.03$). Patients receiving Swedish or light touch massage had an average 58% improvement in severity of their presenting symptom compared to a 50% improvement in patients receiving foot massage. There was no significant difference between Swedish and light touch massage (0.41 points better response for light touch; 95% C.I. $-0.11, 0.13$; $P = 0.12$).

Table 2
Improvements in Symptom Scores Following Massage Therapy

Symptom	n	Baseline	Post-treatment	Change	Improvement
Presenting ^a	1290	6.6 (2.5)	3.2 (2.7)	3.4 (2.6)	54.1% (34.1)
Pain	1284	3.6 (2.9)	1.9 (2.2)	1.7 (2)	40.2% (40.9)
Fatigue	1263	4.7 (2.9)	2.7 (2.7)	2.1 (2.2)	40.7% (39.1)
Anxiety	1273	4.6 (3.1)	1.8 (2.2)	2.8 (2.5)	52.2% (39.5)
Nausea	1255	1.4 (2.4)	0.7 (1.6)	0.7 (1.6)	21.2% (38.3)
Depression	1254	2.4 (2.8)	1.2 (2)	1.2 (1.9)	30.6% (41.0)
Other	105	6.5 (2.5)	3.4 (2.8)	3.1 (2.8)	46.6% (36.9)

Figures are given as mean (standard deviation).

^aDefined as the symptom with the highest score at baseline.

Table 3
Improvements in Symptom Scores After Massage Therapy

Symptom	<i>n</i>	Baseline	Post-treatment	Change	Improvement
Presenting ^a	1131	7.3 (1.9)	3.5 (2.7)	3.7 (2.6)	52.0% (33)
Pain	625	6.1 (1.8)	3.3 (2.3)	2.9 (2.2)	47.8% (32.2)
Fatigue	819	6.6 (1.8)	3.8 (2.6)	2.8 (2.4)	42.9% (35.4)
Anxiety	786	6.7 (1.9)	2.7 (2.3)	4 (2.4)	59.9% (30.2)
Nausea	222	6 (1.9)	3 (2.5)	3.1 (2.4)	51.4% (37.4)
Depression	378	6.2 (1.9)	3.2 (2.5)	3 (2.3)	48.9% (35.7)
Other	94	7.1 (2)	3.7 (2.8)	3.4 (2.8)	48.3% (35.5)

Data include only baseline scores of four or higher. Figures are given as mean (standard deviation).

^aDefined as the symptom with the highest score at baseline.

Similar effects appear for additional massage therapy interventions. Percent improvement in presenting symptoms for episodes two to five for the same individuals are, respectively: 53% ($n = 450$; 95% C.I. 50%, 56%); 58% ($n = 203$; 95% C.I. 54%, 63%); 56% ($n = 118$; 95% C.I. 49%, 62%) and 61% ($n = 73$, 95% C.I. 53%, 69%). Indeed, in a general linear model adjusted for baseline score and clustered by patient, the coefficient for each treatment was negative and statistically significant ($P = 0.001$), suggesting that the effects of massage therapy probably increase for each additional treatment.

We attempted to follow about one in four patients (83 outpatients and 247 inpatients) for up to two days to obtain data in addition to their immediate post-treatment scores. Inpatients and outpatients were assessed typically two to five hours after treatment; outpatients were additionally assessed approximately 24 and 48 hours after treatment. Data were obtained from 74 outpatients (89%) and 237 inpatients (96%). These patients versus those we did not attempt to follow beyond 48 hours received similar therapies: 43%, 53%, 9% vs. 48%, 47%, 8% received regular, foot or light massage, respectively. The two groups also had comparable immediate responses to therapy (53% vs. 54% improvement, $P = 0.6$) and similar proportions of inpatients (78% v. 73%). Baseline scores were slightly lower in patients followed longer (6.3 vs. 6.7), suggesting that patients followed beyond 48 hours were reason-

ably representative of the whole sample. As shown in Table 5, the effects of touch therapy for inpatients did not persist in the longer term. Two to five hours after treatment, scores were approximately 0.5 points higher than immediately after treatment. This suggests that inpatient severity scores returned to baseline within a day or so.

The effects of massage therapy lasted longer for outpatients. Indeed, there is no evidence that symptom scores regress toward baseline values (Fig. 1). There was no difference between types of massage therapy concerning the time course of symptom improvement.

Discussion

This is the largest study of massage for cancer patients yet reported. Such studies typically note sample sizes of six,¹⁴ 23¹⁵ and 54.¹³ We found no study of massage therapy with a sample size greater than 100. This may reflect that massage therapy services have been available only rarely until recently, at major cancer centers. Our first conclusion, therefore, is that implementation of a high volume massage therapy service is feasible at a major cancer center.

Major, clinically relevant, immediate improvements in symptom scores were reported following massage therapy. Given the observational nature of this study, we cannot make conclusions about the cause of this effect. However,

Table 4
Differences in Effect by Type of Massage Therapy

Type of massage	<i>n</i>	Baseline	Post-treatment	Change	Improvement
Swedish	550	6.7 (2.5)	3.1 (2.7)	3.1 (2.7)	57% (32)
Light touch	88	6.7 (2.5)	2.7 (2.7)	2.7 (2.7)	62% (35)
Foot	574	6.5 (2.5)	3.4 (2.8)	3.4 (2.8)	50% (36)

Figures are given as mean (standard deviation).

Table 5
Symptom Scores for Longer-Term Follow-Up

Outpatients	
Baseline	<i>n</i> = 74: 5.8 (2.2)
Post-treatment	<i>n</i> = 73: 2.7 (2.1)
Later same day	<i>n</i> = 53: 2.9 (2.3)
Next day	<i>n</i> = 49: 2.7 (2.2)
Two-day follow-up	<i>n</i> = 38: 2.6 (2.4)
Inpatients	
Baseline	<i>n</i> = 237: 6.2 (2.4)
Post-treatment	<i>n</i> = 237: 3.1 (2.7)
Later same day	<i>n</i> = 237: 3.7 (2.9)

Figures are given as mean (standard deviation).

it is notable that the size of the effects found are highly similar to those reported in prior randomized trials of massage therapy in cancer patients. For example, Grealish et al. reported that pain and anxiety scores improved during treatment from approximately 2.5 to 1.5 (40%) and from 5.4 to 3.2 (41%), respectively, with no change in controls.¹² The comparable figures reported by Stephenson et al. are 2.9 to 1.4 (53%) and 4.7 to 2.4 (50%), again, with marginal change in controls (15). This suggests that the results reported in randomized trials can be achieved in the clinical setting.

The effects of massage were smaller and less persistent for inpatients. There are two possible explanations. First, inpatients are more subject to intervening events than are outpatients. They may undergo procedures or have medication changed. Inpatients also tend to receive shorter massage treatments in less comfortable settings

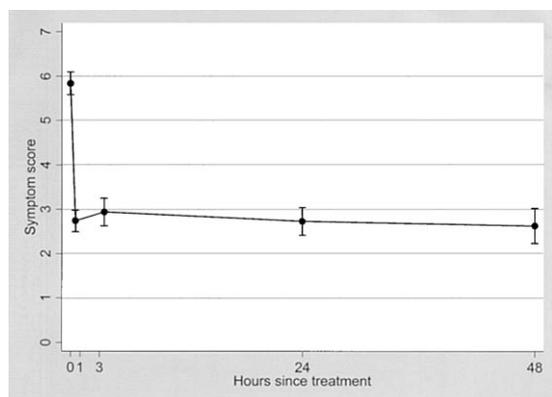


Fig. 1. Time course of treatment effects for outpatients: symptom scores are given as means with standard errors.

than do our outpatients. The relationship between the length of massage treatment and the size and duration of effects is worthy of further research.

We found that Swedish and light touch massage were superior to foot massage, even after controlling for baseline severity and location of treatment. It may be that the effects of touch to the body are more profound than touch given only to the feet. However, it is also possible that the apparently lesser effects of foot massage reflect a case mix inadequately captured by baseline symptom scores. For example, weak or cachectic patients often receive massage just to the feet rather than the whole body. Set against such an explanation is that such patients also receive light touch massage.

In conclusion, massage therapies apparently lead to large, immediate improvements in symptoms scores in cancer patients, even those with very high baseline scores indicating substantial levels of pain, anxiety, or other symptoms. Outpatients experienced persisting benefit across the total of 48 hours studied. We plan a prospective controlled trial for longer periods of time to determine the duration of effect. Meanwhile, it is clear that massage therapy achieves major reductions in cancer patients' pain, fatigue, nausea, anxiety and depression. Massage therapy appears to be an uncommonly non-invasive and inexpensive means of symptom control for patients with serious chronic illness. It is non-invasive, inexpensive, comforting, free of side effects and greatly appreciated by recipients. This non-randomized study suggests that it is also markedly effective.

Acknowledgments

Anne Seidler collated and entered the data for this article. The authors also thank the MSKCC massage therapists, headed by Wendy Miner, LMT and the staff of the MSKCC Bendheim Integrative Medicine Center.

References

1. Spitz RA. Hospitalism: an inquiry into the genesis of psychiatric conditions in early childhood. The Psychoanalytic Study of the Child, Vol. 1. New York: International Universities Press. 1945;1:53-74.

2. Spitz RA, Wolf KM. Anaclitic depression: an inquiry into the genesis of psychiatric conditions in early childhood. *The Psychoanalytic Study of the Child*, Vol. 2. New York: International Universities Press. 1946;2:313-342.
3. Harlow H. A variable-temperature surrogate mother for studying attachment in infant monkeys. *Behav Res Meth* 1973;5(3):269-272.
4. Montagu A. *Touching: The human significance of skin*. New York: Harper & Row, 1986.
5. Vickers A, Zollman C. ABC of complementary medicine. *Massage therapies*. *BMJ* 1999;319(7219):1254-1257.
6. Ashikaga T, Bosompra K, O'Brien P, et al. Use of complementary and alternative medicine by breast cancer patients: prevalence, patterns and communication with physicians. *Support Care Cancer* 2002;10(7):542-548.
7. Bernstein BJ, Grasso T. Prevalence of complementary and alternative medicine use in cancer patients. *Oncology* 2001;15(10):1267-1272.
8. Vickers A. *Massage and aromatherapy: a guide for health professionals*. London: Chapman and Hall, 1996.
9. Grossman SA, Benedetti C, Payne R, et al. NCCN practice guidelines for cancer pain. *Oncology* 1999;13(A11):33-44.
10. Weinrich SP, Weinrich MC. The effect of massage on pain in cancer patients. *Appl Nurs Res* 1990;3(4):140-145.
11. Ferrell-Torry AT, Glick OJ. The use of therapeutic massage as a nursing intervention to modify anxiety and the perception of cancer pain. *Cancer Nurs* 1993;16(2):93-101.
12. Grealish L, Lomasney A, Whiteman B. Foot massage. A nursing intervention to modify the distressing symptoms of pain and nausea in patients hospitalized with cancer. *Cancer Nurs* 2000;23(3):237-243.
13. Ahles TA, Tope DM, Pinkson B, et al. Massage therapy for patients undergoing autologous bone marrow transplantation. *J Pain Symptom Manage* 1999;18(3):157-163.
14. Sims S. Slow stroke back massage for cancer patients. *Nursing Times* 1986;82(47):47-50.
15. Stephenson NL, Weinrich SP, Tavakoli AS. The effects of foot reflexology on anxiety and pain in patients with breast and lung cancer. *Oncol Nurs Forum* 2000;27(1):67-72.