Multiple sclerosis patients benefit from massage therapy

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Abstract Twenty-four adults with multiple sclerosis were randomly assigned to a standard medical treatment control group or a massage therapy group that received 45-minute massages twice a week for 5 weeks. The massage group had lower anxiety and less depressed mood immediately following the massage sessions and, by the end of the study, they had improved self-esteem, better body image and image of disease progression, and enhanced social functional status.

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Introduction

Multiple sclerosis (MS) is a degenerative neurological disorder and is one of the most debilitating and difficult diseases to treat (Mitchell 1993, Woolf 1995). A hyperactive immune response that targets the central nervous system (CNS) underlies the disease (Hafler & Weiner 1989). MS commonly affects the brain, sensory, cognitive, bowel and bladder functions, and patients frequently experience physical symptoms such as constipation, limb numbness/weakness, ataxia (shaking), spasticity (rigidity), loss of vision, fatigue and pain (Chia et al 1996).

Immunomodulating drugs and steroid therapy (including antibodies, corticosteroids and interferons) have been used with some success in treating the symptoms of MS (Lindsey et al 1994; Becker et al 1995). Although some of these drugs help relieve symptoms, they do not reverse the disease progression and they often have adverse side-effects (e.g. increased spasticity, nausea, depression, myalgia, fever, headaches) (Lublin et al 1996; Neilley et al 1996). MS patients also experience anxiety, depression, poor body image, and low self-esteem (Foley 1987). These problems, and decreased physical and social functioning, contribute to lifestyle problems and stress for MS patients (Hermann et al 1996). Stress has been correlated with relapse, disease progression and inactivity (Morrison & Nelson 1994), which in turn result

in cognitive impairment and depression (Gichrist & Creed 1994).

One study reported that two-thirds of the MS respondents surveyed sought alternative therapies because traditional therapies did not cure their disease (Fawcett et al 1994). The studies on alternative or complementary therapies, however, are not well-controlled and the findings are mixed. In one study, for example, relaxation training and imagery were successful in reducing anxiety in MS patients but not in improving mood or in reducing MS symptoms (Maguire 1996).

Massage therapy is reported to be one of the most frequently used alternative therapies by MS patients, although no research has been conducted on its use with MS (Fawcett et al 1994). Massage therapy research has been conducted on other conditions, however. For example, beneficial effects of massage have been demonstrated for:

- chronic fatigue syndrome (Field et al 1997d)
- fibromyalgia (Sunshine et al 1996)
- juvenile rheumatoid arthritis (Field et al 1997c)
- asthma (Field et al 1997a)
- diabetes (Field et al 1997b).

In all of these studies massage therapy decreased somatic symptoms. Massage therapy has also been found to decrease anxiety and stress hormones (Field et al 1992), and to improve mood and increase range of motion (Hernandez-Reif et al 1997), suggesting that massage may be therapeutic for MS patients.

The aim of the present study was to evaluate the use massage therapy in improving the psychological and physical profile associated with MS. Specific objectives included:

1. relieving anxiety and depression
2. improving mood, self-esteem and body image
3. increasing ambulation, physical and social functioning.

Method

Participants

Twenty-four adults (18 women) with MS were recruited from an MS clinic and from community support groups. The participants were from middle socioeconomic status households (mean (Hollingshead Index) = 2.4, standard deviation (SD) = 0.9). Seventy-one per cent were White and 29% Hispanic; participants averaged 47.5 years of age (SD = 10.9 years). Ambulation index scores revealed that 20% of the participants walked independently (grade 1–2), 60% required unilateral support (grade 3–6) and 20% used a wheelchair (grade 7–9) (see Ambulation Index in Assessment section for grade description). Following physicians' referral, and signed informed consent from the participants, subjects were randomly assigned to a massage therapy or a control group. Assessment and treatment sessions were conducted at the participants' homes because they found it difficult to visit our facility. One participant was dropped from the study because of a conflict in scheduling appointments and another withdrew due to a serious illness in her family that required her to travel.

Procedures

The control group received standard medical care for MS from their primary care physician. Those assigned to the massage therapy group received 45 minutes of massage therapy twice weekly for 5 weeks in addition to their standard medical treatment.

Massage therapy

The massage routine was designed (by Will Green, LMT) to promote relaxation and relieve muscle tightness and was conducted by trained massage therapists. The participant was covered in a prone position on a massage table with the face in a face rest, and with body cushions

supporting the hip, chest and ankles. Through the sheet, using the palms of the hands, the therapist stroked the back to check for cool spots that might indicate lack of circulation. With the sheet pulled to reveal the entire back oil was applied to the back using the following sequence of strokes:

1. Standing beside the table, gliding back and forth hand movements were conducted from the hip to the neck for 3 minutes. The same strokes were repeated from the other side of the table.
2. Using the pads of the finger tips, small rubbing strokes were conducted pushing away from the spine starting at the hip and ending at the top of the shoulder. This step was repeated on the other side for 3 minutes.
3. Standing at the head of the table, using both hands, long strokes were applied from the neck to the hip, back to the neck, across the shoulders and off the elbows. This was repeated five times.
4. Using the pads of the fingers, strokes were applied from the neck down the spine, up to the shoulders and down to the elbows. This was repeated five times.
5. Using the thumbs, short rubbing strokes were applied across the muscles of one, and then the other, shoulder for 3 minutes on each side.
6. Long strokes starting at the middle of the back to the base of the neck and ending with a gentle pull five times.
7. Standing beside the table, each arm, wrist, hand and finger was massaged using kneading and wringing motions for 2 minutes.
8. Using the entire surface of the hands, the back was stroked from the hip to the top of the shoulders using hand over hand motion.

With the participant covered and in a supine position with a bolster under the legs and the head, the following strokes were conducted:

1. Standing beside the table and massaging through the sheet, using the palms of the hands, strokes across the abdomen checking for cool spots.
2. With a towel covering the chest, oil was applied to the exposed abdomen using gliding strokes with gentle pressure applied to the sides of the colon.
3. Using the flat of the hands, the abdomen was stroked diagonally from the hips to the ribs and then reverse stroking was done from the ribs to the hips five times for each segment.
4. Placing one hand under the participant to support the back, the middle and index finger pads of the other hand were used to gently press across the fibres of the middle of the abdomen starting below the ribs and stopping one inch below the navel. This was repeated five times on each side of the table.
5. Repetition of steps 2 and 3.

Assessments

Participants were first assessed by their physician on the Kurtzke Expanded Disability Status Scale (EDSS) (Kurtzke 1983).

The EDSS scale uses steps and grades to rate neurological impairment and disease activity from 0 (normal neurological exam) to 6 (intermittent or unilateral constant assistance) to 8 (essentially restricted to bed or chair or perambulated in wheelchair, but may be out of bed much of the day). For the purpose of this study, patients were not recruited if their EDSS scores were above 8 (e.g. helpless bed patient). The EDSS is calculated using the Functional System Scale (FSS) to individually rate brain, sensory, bowel and bladder, visual and nervous system function (Kurtzke 1983). Intra-rater reliability for this assessment has been high, with intra-class correlation coefficients ranging from 0.88 to 0.96

and acceptable inter-rater agreement ranging from 0.65 to 0.71 for patients in the 1.0–3.5 EDSS point range (Goodkin et al 1992).

Following physician referral, participants were assigned to a massage or control group.

Pre–post session measures (immediate effects)

These measures were given to subjects before and after the massage for those in the treatment group and before and after a 45-minute control period for those in the control group. These allowed for the assessment of immediate treatment effects on anxiety and mood.

Stress measures

State Anxiety Inventory
The State Anxiety Inventory (STAI) (Spielberger et al 1970), is a 20-item inventory on how the participant feels at the moment. Characteristic items include 'I feel nervous' and 'I feel calm' and are answered in terms of severity ('not at all' to 'very much so'). The STAI scores increase in response to stress and decrease under relaxing conditions. Research has demonstrated that the STAI has adequate concurrent validity (Spielberger et al 1970) and internal consistency (r = 0.83; Spielberger 1972).

Profile of Mood States Depression Scale
The Profile of Mood States Depression Scale (POMS) (McNair et al 1971) consists of 19 adjectives reflecting 'present' depressed mood rated on a 5-point Likert scale ranging from 'not at all' to 'extremely'. Characteristic words include 'blue', 'sad' and 'lively'. The scale has adequate concurrent validity and good internal consistency (r = 0.95; McNair & Lorr 1964) and is an adequate measure of intervention effectiveness (Pugatch et al 1969).

First–last day session measures (longer term effects)

On the first and last day of the 5-week study, the following assessments were administered.

Self-perception measures
The IAT Drawing (Maguire 1996). Participants are instructed to 'draw the image you associate with the disease process, and comment on your inner healing resources and imagery associated with any external treatments.' The drawings were coded by two independent raters for the presence of seven negative characteristics:

1. sad face
2. missing body part
3. distorted body part
4. displaced body part
5. negative written comment
6. using a cane or wheelchair
7. restraints.

A higher score indicated a more negative association of the disease process and treatment effects. Inter-rater agreement ranged between 0.91 and 1.0 for two independent coders from our institute who scored 18 of the drawings from this study.

Rosenberg Self-Esteem Scale (Rosenberg, 1965). This scale consists of 10 statements pertaining to self-esteem (e.g. 'Sometimes I think I'm no good at all'). Responses are rated on a 5-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. Five of the items are reversed to ensure that the patients is considering each item before answering. This scale has acceptable test–retest reliability (Rosenberg, 1965).

Multidimensional Body–Self Relations Questionnaire – modified for multiple sclerosis (Brown Cash & Mikulka, 1990). This two-part questionnaire asks participants to:

1. rate their satisfaction with various parts of their bodies (e.g. upper torso, chest) using a range from 'very dissatisfied' to 'very satisfied'

2. to answer questions about the disease and body awareness (e.g. 'Does it affect the way you dress?') using a 4-point range from 'definitely agree' to 'definitely disagree'.

Score consistency is within an acceptable range for this test.

Functional Status

Inventory of Functional Status – Multiple Sclerosis (Fawcett et al 1996). This self-report scale assesses functioning on four dimensions:

- household activities
- social and community activities
- life during the past few weeks
- life at work.

Participants rate the extent to which they are currently able to do different activities (e.g. laundry, socialize with friends, social clubs) on a scale of 1 (not at all) to 4 (fully). They are also asked to rate statements about lifestyle ('rest or sleep more during the day', 'have difficulty dressing myself') and work ('working fewer hours', 'acting irritably toward my work associates') on a scale of 1 (never) to 4 (all of the time). Some of the items are reversed. The higher the score the greater the functional status. The psychometric properties of this scale are based on an identical instrument that assesses functional status of cancer patients (Tulman et al 1991) and which has yielded internal consistency reliability coefficients ranging from 0.73 to 0.92 and content validity of 99%.

Ambulation Index (Hauser et al 1983). This index assesses level of mobility; scores range from 0 (asymptomatic, fully active) to 4 (requires unilateral support, that is cane or single crutch) to 9 (restricted to wheelchair, unable to transfer self independently). The index measured the participants' perception of ambulation and provided another quantitative assessment of functional status. The evaluation was based on the clinical impression and the patients' own assessment of the

treatment. Improvement was defined as a decrease of one or more points on the scale on the last evaluation day as compared with the score on the first day's assessment. This scale has acceptable inter-rater reliability (Rose et al 1968).

Results

T-tests and χ^2 analyses (see Table 1) yielded no group differences on age, gender, ethnicity and socioeconomic status (according to the Hollingshead Index). Although no differences were found between groups on the Ambulation Index, the physicians' report on the Expanded Disability Status Scale revealed differences favouring the control group (Table 1).

Repeated measures by group (massage/control) MANOVAs and ANOVAs were conducted to determine the effects of massage therapy on MS. The repeated measures were pre- and post-therapy (sessions) and first and last days (days). Significant interaction effects were followed by Bonferroni t-tests.

Pre–post session measures (immediate effects)

Stress Measures
A group-by-sessions interaction effect, $F(1,22) = 4.45, P = 0.05$, revealed a decrease in anxiety (STAI) on the first day for the massage group. A group effect, $F(1,22) = 14.04, P = 0.001$, on the depressed mood scale (POMS) revealed improved mood for the massage group (Table 2).

First–last day session measures (longer term effects)

Self-perception measures
A group-by-days interaction effect, $F(1, 22) = 5.47, P = 0.03$, revealed that the massage group had fewer negative characteristics on their drawings of disease progression by the last day. A group-by-days interaction effect, $F(1,22) = 6.26, P = 0.02$, showed better

self-esteem for the massage group by the end of the study. A group-by-days interaction effect, $F(1,22) = 7.72, P = 0.011$, also showed improvement in body satisfaction for the massage group by the last day of the study (Table 2).

Functional status
A group-by-days interaction effect on the inventory of functional status, $F(1,22) = 7.83, P = 0.01$, suggested that the massage group engaged in more socializing activities by the last day of the study (Table 2).

Discussion

Self-reports revealed that, immediately after massage therapy, adults with MS were less anxious and depressed. Similar effects have been observed after giving massage therapy for other autoimmune diseases including fibromyalgia (Sunshine et al 1996), chronic fatigue syndrome (Field et al 1997d) and juvenile rheumatoid arthritis (Field et al 1997c). Anxiety and stress have been linked to relapse in MS patients (Morrison & Nelson 1994) and increased depressed mood has been associated with poor quality of life (Hermann et al 1996), social stress and cognitive impairment (Gilchrist & Creed 1994). Moreover, depression is often a side-effect of medication for MS patients and has been significantly associated with discontining drug therapy (Lublin et al 1996; Neilley et al 1996). The findings of the present study, showing that massage therapy effectively attenuated feelings of anxiety, depression and poor mood, has important health implications for MS patients. Future studies might explore if longer term massage therapy for MS may 1) keep the patient from relapsing, 2) help with medication compliance, and 3) prevent the disease from progressing. Because no follow-up assessments were conducted it is difficult to determine whether massage therapy has

Table 1 Demographic data for deviations in massage and control groups

Variable	Massage Mean (SD)	Control Mean (SD)	χ^2 P-value	t-test P-value
Age	48.9 (9.9)	47.1 (12.3)		NS
Gender			NS	
Male	2	4		
Female	10	8		
Ethnicity			NS	
Anglo	9	8		
Hispanic	3	4		
Hollingshead			NS	
Upper	2	2		
Middle	8	9		
Lower middle	2	1		
Physician Scale *			Mann Whitney U	
Ambulation Index	4.7 (1.9)	3.8 (2.3)	NS	
Expanded Disability Status Scale (EDSS) *	5.9 (1.7)	4.6 (1.2)	0.02	
Functional Scale *				
Bowel and bladder	3.2 (2.9)	0.8 (0.7)	0.04	
Brain stem	1.2 (0.6)	1.2 (0.6)	NS	
Cerebellar	1.6 (1.4)	1.4 (1.1)	NS	
Other	0.8 (0.5)	0.7 (0.5)	NS	
Pyramidal	3.0 (1.1)	2.5 (1.0)	NS	
Sensory	2.6 (0.6)	1.6 (0.9)	0.01	
Visual	0.6 (0.6)	0.6 (0.8)	NS	

* Lower score is optimal
NS: no score.

long-term carry-over benefits. We hypothesize that a regular massage therapy schedule may be necessary to maintain the positive effects obtained in this study. In this study only 5 minutes of the massage therapy focused on the arms and hands. A massage routine that focuses on treating the hands and arms may increase motor function; this area is recommended for future study.

By the last day of the study the massage therapy group had improved self-esteem and were more satisfied with their bodies. In addition, the drawings they made of their disease progression contained fewer negative characteristics. These findings are encouraging as MS patients score poorly on health perceptions compared to other neurological conditions (e.g. epilepsy) or to chronic illness (e.g. diabetes) (Brunet 1996, Hermann et al 1996). Massage therapy may also minimize the adverse psychological effects of living with MS and may improve the quality of life of adults with MS. This is perhaps best supported by the finding from the present study of an increase in social function and community activities for the massage therapy group. A possible explanation for the increased perception in social function, however, might have occurred from the participants' viewing the therapists' visit as a social call. Future studies might control for the potential placebo effects of extra attention by having the therapists visit the home of those in the control group on the same schedule as those in the massage therapy group. The increase in community activities, however, cannot be explaned by the participants perceiving the therapists' visit as a social call since community activities generally occur outside of the home. In sum, although more extensive studies are needed with larger

Table 2 Stress measures for pre–post session assessments and psychological and physical measures for first–last day sessions

	Massage First Day Pre mean (SD)	Massage First Day Post mean (SD)	Massage Last Day Pre mean (SD)	Massage Last Day Post mean (SD)	Control First Day Pre mean (SD)	Control First Day Post mean (SD)	Control Last Day Pre mean (SD)	Control Last Day Post mean (SD)
Variables								
Immediate effects								
Anxiety (STAI)	$40.9\ (7.0)_a$	$27.9\ (7.0)_b^3$	$34.0\ (10.5)_b^1$	$27.7\ (5.7)_b^2$	$41.3\ (8.6)_a$	$36.2\ (3.1)_a$	$37.0\ (3.7)_a$	$33.4\ (4.7)_a$
Depression (POMS)	$8.8\ (6.0)_a$	$2.7\ (3.7)_b^4$	$5.2\ (4.7)_b^1$	$1.8\ (1.9)_b^2$	$5.9\ (7.1)_a$	$5.8\ (8.2)_a$	$2.0\ (2.0)_b^1$	$2.1\ (2.5)_b^1$
Longer term effects								
Imagery drawing (IAT)	$2.2\ (1.7)_a$		$1.1\ (1.1)_b^2$		$2.4\ (1.6)_a$		$2.7\ (1.5)_a$	
Self-esteem (Rosenberg)*	$33.4\ (5.7)_a$		$41.7\ (5.2)_b^2$		$30.8\ (6.1)_a$		$33.9\ (6.0)_a$	
Body image*								
Body satisfaction	$1.9\ (0.6)_a$		$2.7\ (0.7)_b^1$		$2.0\ (0.7)_a$		$1.8\ (0.9)_a$	
Body awareness	$2.2\ (0.5)_a$		$2.4\ (0.7)_a$		$3.0\ (0.5)_a$		$2.4\ (0.9)_a$	
Functional status*								
Household	$2.3\ (0.7)_a$		$2.4\ (0.7)_a$		$3.1\ (0.5)_a$		$3.2\ (0.4)_a$	
Social/Community	$2.6\ (0.9)_a$		$4.7\ (0.9)_b^1$		$3.2\ (0.5)_a$		$2.9\ (0.4)_a$	
Lifestyle	$2.4\ (0.4)_a$		$3.0\ (0.6)_a$		$2.8\ (0.3)_a$		$2.9\ (0.2)_a$	
Work	$2.7\ (0.6)_a$		$2.8\ (0.5)_a$		$3.1\ (0.7)_a$		$3.4\ (0.2)_a$	

*Higher score is optimal. Different letter subscript indicates different means. Superscript indicates levels of significance ($^1P = 0.05$, $^2P = 0.01$, $^3P = 0.005$, $^4P = 0.001$).

samples, the findings from this study are compelling and document the potentially therapeutic effects of massage therapy for ameliorating psychological and functional symptoms associated with MS.

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