



# Reducing the symptoms of lymphoedema: Is there a role for aromatherapy?

Janet Barclay, Jenny Vestey, Anita Lambert, Claire Balmer\*

Dorset Cancer Centre, Poole Hospital, Longfleet Road, Poole BH15 2JB, UK

## KEYWORDS

Lymphoedema;  
Aromatherapy;  
Massage;  
Skin care;  
MYMOP2;  
Randomized controlled trial

**Summary** Lymphoedema is a chronic and debilitating condition caused by lymphatic insufficiency, which may have serious physical, social and psychological implications for the patient. It is usually managed by a combination of strategies aimed at protecting and decongesting the oedematous limb(s) and stimulating the development of supplementary lymphatic pathways to control swelling in the long-term. However, it is not known which therapies are the most effective. Anecdotally, the addition of aromatherapy oils to massage cream may have a positive effect on symptom relief in people with cancer, although evidence is again lacking. This paper describes a randomized trial of self-massage and skin care using a cream containing aromatherapy oils versus self-massage and skin care using a cream without aromatherapy oils on objective limb volume measurements and symptom relief as measured by the Measure Yourself Medical Outcome Profile 2 (MYMOP2) in a sample of people with lymphoedema. Results indicate that self-massage and skin care significantly improved patient-identified symptom relief and wellbeing for this sample. It also slightly, but not significantly reduced limb volume. However, aromatherapy oils, carefully chosen on the basis that they should benefit this group, did not appear to influence any improvement in these measures.

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**Zusammenfassung** Das Lymphödem stellt ein chronisches und sehr belastendes Leiden dar, das die Folge einer Insuffizienz des Lymphgefäßsystems ist und schwerwiegende körperliche, soziale und seelische Folgen für die betroffenen Patienten hat. Die Behandlung besteht in der Regel aus einer Kombination von Maßnahmen, welche darauf abzielen, die ödematösen Extremitäten zu schützen und abschwellen zu lassen; ferner haben diese Maßnahmen zum Ziel, die Entwicklung von zusätzlichen Lymphgefäßen zu fördern, um das Lymphödem langfristig beherrschen zu können. Bislang ist noch unklar, welche Therapien am wirksamsten sind. Der Zusatz von aromatherapeutischen Ölen zu Massagecremes kann zu einer Linderung der Symptome führen, wobei jedoch entsprechende wissenschaftliche Daten bislang noch fehlen. In diesem Artikel wird eine randomisierte Studie vorgestellt, in der folgende therapeutische Maßnahmen verglichen wurden: Selbstmassage und Hautpflege mit einer Salbe mit Zusatz von aromatherapeutischen Ölen versus

\*Corresponding author. Tel.: +44 1202 442135; fax: +44 1202 442825.  
E-mail address: claire.balmer@poole.nhs.uk (C. Balmer).

Selbstmassage und Hautpflege mit einer Salbe ohne aromatherapeutische Öle; Outcome-Parameter waren objektive Messergebnisse des Umfangs der betroffenen Extremitäten sowie die Linderung der Symptome gemäß *Measure Yourself Medical Outcome Profile 2* (MYMOP 2) bei einer Stichprobe von Patienten mit Lymphödem. Die Ergebnisse weisen darauf hin, dass Selbstmassage und Hautpflege in dieser Stichprobe zu einer signifikanten Besserung der von den Patienten angegebenen Symptome sowie des Wohlbefindens führte. Darüber hinaus kam es zu einer leichten, jedoch nicht-signifikanten Abnahme des Umfangs der betroffenen Extremitäten. Sorgfältig ausgewählte, auf ihre potentiellen Vorteile für die untersuchten Patienten geprüfte aromatherapeutische Öle hatten demgegenüber offenbar keinerlei Einfluss auf die Besserung der Outcome-Parameter.

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## Introduction

Lymphoedema is a chronic, progressive condition leading to swelling usually in the limbs and trunk. It develops when the lymphatic system is unable to keep up with the normal demands of tissue homeostasis, often because of damaged or abnormal lymph glands (Hare, 2000; Badger et al., 2004; Williams et al., 2004).

The main causes of lymphoedema are cancer and cancer treatment, congenital abnormalities of the lymphatic system, chronic venous disease and filariasis, a parasitic infection endemic in parts of Africa and India (Badger et al., 2004).

The incidence and prevalence of lymphoedema is difficult to determine, largely due to many variations in measuring techniques and diagnosis (Logan, 1995; Maguire, 2004). Moffatt et al. (2003) surveyed healthcare providers in South West London and found a crude prevalence of lymphoedema from any cause of 1.33 per 100,000. Unilateral lymphoedema of the arm has a much higher incidence in women reflecting the damage caused by surgery and radiotherapy to the axillary lymphatic system in the treatment of breast cancer (Badger et al., 2004; Williams, 2004). Again, its true prevalence is unknown and estimates differ significantly (Petrek and Heelan, 1998; Erikson et al., 2001). However, it is generally agreed that at least a third of people who have been treated for breast cancer will develop it (Maguire, 2004; Howell and Watson, 2005). The figures for lymphoedema of the lower limb are even less reliable but it appears to be a major problem (Badger et al., 2004; Williams, 2004). Furthermore, lymphoedema can develop years after the original damage to the lymph nodes, often due to triggers such as infection, injury, late side-effects of radiotherapy or tumour recurrence (Woods, 2003).

Lymphoedema can lead to significant physical, psychological, economic and social disruption

(Poole and Fallowfield, 2002; Moffatt et al., 2003; Williams et al., 2004; Howell and Watson, 2005). Swelling can interfere with mobility and ability, cause pain, alter sensation, affect body and self-image and lead to an increased risk of infection (Badger et al., 2004). Furthermore, in the case of lymphoedema secondary to cancer treatment, it offers a constant reminder of the individual's disease (Maguire, 2004; Williams, 2004).

The treatment of lymphoedema is not a well-researched area (Hare, 2000; Badger et al., 2004). Its management involves decongesting and stimulating the reduced lymphatic pathways and promoting the development of collateral drainage routes to control swelling in the long-term (Badger et al., 2004). Early conservative treatment and a combination of strategies is usually recommended, including skin care, exercise, simple lymphatic drainage (SLD) by self-massage, manual lymphatic drainage (MLD) compression, education and psychological support (British Lymphology Society, 1999; Woods, 2003).

Aromatherapy involves the therapeutic use of essential plant oils and has existed for 5000 years (Wheeler-Robins, 1999). It is increasingly being used in the cancer care and dermatology settings (Kite et al., 1998; Wilkinson et al., 1999; Stevenson, 1999; Fellowes et al., 2004). Although the positive effects of massage with aromatherapy in lymphoedema management are often reported, a literature search revealed only one previous study specifically referring to aromatherapy massage for lymphoedema (Kirshbaum, 1996). In this study, massage with lavender oil was performed on eight women with lymphoedema secondary to breast cancer treatment. The reported results concentrated on subjective measurements such as pain relief, relaxation and self-esteem, which all improved. A noticeable reduction in swelling was also reported.

Recent Cochrane reviews have evaluated therapies for the reduction and control of lymphoedema and cancer symptom relief using aromatherapy and massage. The former was unable to confirm which physical therapy has the most important role in reducing and controlling lymphoedema (Badger et al., 2004). It also criticized studies for being too small-scale, providing too little follow-up data and concentrating on only one population (such as women with lymphoedema secondary to breast cancer). It concluded with a call for further research, particularly randomized trials, to find the best approach to managing lymphoedema. The latter was also unable to draw firm conclusions about the benefits of massage and aromatherapy for people with cancer and again called for more research (Fellowes et al., 2004).

### Study objective

To assess the effectiveness, in terms of an objective reduction in limb volume and patient-reported symptom improvement and 'well-being', of SLD and skin care/hydration by self-limb massage using a base cream containing aromatherapy oils versus a base cream alone, in the treatment of lymphoedema.

## Methods

### Subjects and setting

All adult patients ( $\geq 18$  years) referred to the Dorset Cancer Centre lymphoedema service with at least one year's history of symptomatic, clinically diagnosed bilateral or unilateral stable lymphoedema of the limb(s) and no evidence of acute inflammation, thrombosis or recurrence were invited to join the study (please see Table 1 for referral criteria to service). They had to be able to self-massage their appropriate limb(s) and had to agree to avoid other aromatherapy-based treatments and products during their treatment period. Women who were pregnant or attempting conception and all subjects with any allergy or sensitivity to aromatherapy or wheatgerm oils were excluded (Chart 1).

All patients were randomized in the 'maintenance' phase of management and none had a change of therapy throughout the trial treatment.

All patients who agreed to the study signed a consent form and were then randomly assigned one of the two massage creams by an independent colleague using a 50:50 card system. Randomiza-

**Table 1** Baseline characteristics of participants.

Aromatherapy	Base cream alone	
<i>Age</i>		
Mean ( <i>standard deviation</i> )	61.1(11.2)	60.2(12.6)
<i>Gender</i>		
Women	40	37
Men	0	4
<i>Site</i>		
Arm (unilateral)	30	31
Lower limbs (bilateral)	10	10
<i>Valid cases for analysis</i>		
1 month		76
2 months		74
3 months		71
6 months		50

tion was stratified to age and limb(s) affected (upper or lower). Treatment started immediately (Diagram 2).

### Treatment

The Cancer Centre's qualified complementary therapist especially formulated the aromatherapy cream. It consisted of wheatgerm oil with fennel, sage, geranium, black pepper and juniper essential oils in a base cream. These are thought to be particularly helpful in stimulating the lymphatic system and relieving skin conditions, as described in Table 2 (Stevenson, 1999; Davis, 2000; Whichello Brown, 2003). The standard massage agent consisted of a simple base cream containing wheatgerm oil. All patients performed daily SLD and limb massage, following the principles of lymphatic drainage, after instruction by the lymphoedema nurse specialist. Exercise and skin care were advised for all patients, as in standard lymphoedema therapy, and the use of previously prescribed compression garments continued if indicated.

### Toxicity

There are rare reports of contact dermatitis occurring with some aromatherapy oils (Wheeler-Robins, 1999; Stevenson, 1999), so oils were especially chosen. Because of the nature of

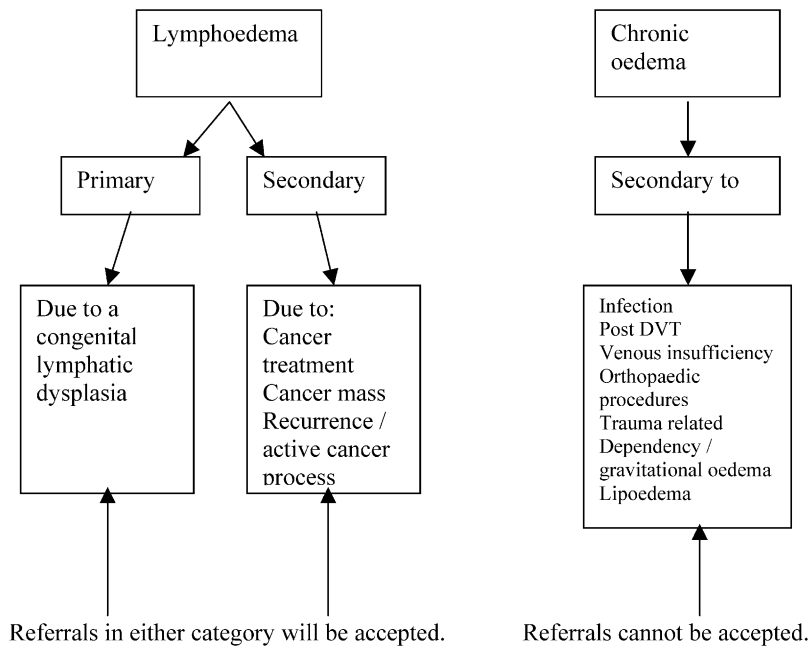


Chart 1 Referral criteria for lymphoedema service at the Dorset Cancer Centre.

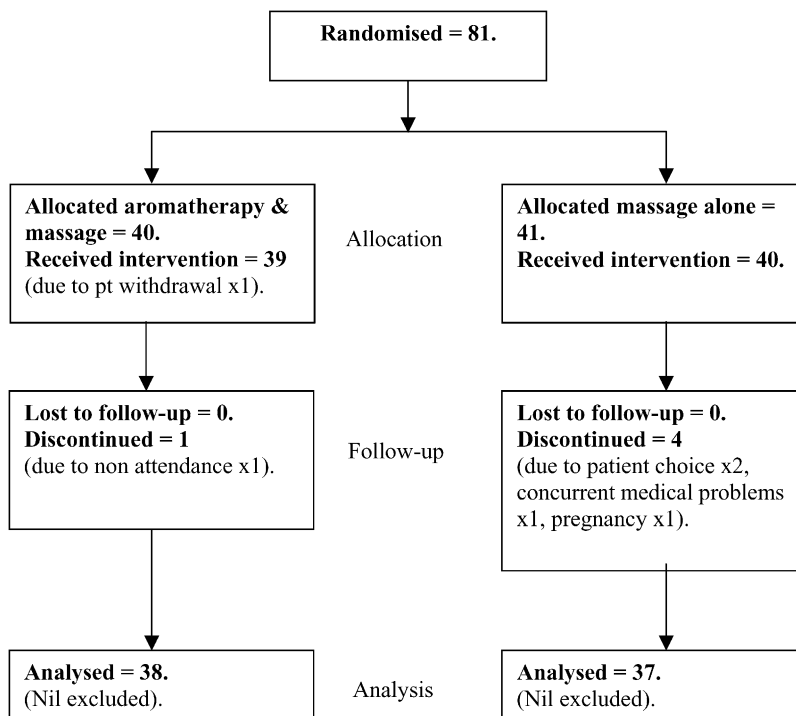


Diagram 2 Flow diagram of progress through the trial phases.

lymphoedema, it was expected that subjects could have sore and inflamed skin. However, they were instructed to report any increased redness, itchiness or inflammation immediately via a 24 h contact number. Patients were warned that the increased movement of fluid produced by the massage may lead to headache, nausea and tiredness.

### Assessments

Limb volume circumferences from a standardized start point were measured at 4 cm segments using a self-tensioning tape measure and recorded as an absolute volume (ml). The truncated cone or frustrum calculation was used to calculate volume.

**Table 2** Specific and relevant properties of the essential oils used in the base cream (Davis, 2000; Whichello Brown, 2003).

Essential oil	Properties
Fennel	A diuretic. Useful in the treatment of cellulites.
Sage	A relaxing oil. Soothes and cools inflamed skin.
Geranium	An antidepressant. An antiseptic. A mild diuretic. Has a stimulating effect on the lymphatic system (often used to relieve cellulitis, fluid retention and oedema).
Black pepper	Relieves muscular aches, pains and stiffness. Instills positive thoughts and action.
Juniper	An antiseptic. A mild diuretic and detoxifier.

Such circumferential measurements are widely used and are both valid and reliable (Howell and Watson, 2005). These measurements were recorded monthly for 3 months. If an improvement was not seen in this time, patients were taken off the trial and commenced standard treatment. If a change of therapy was not indicated, patients were encouraged to continue their daily massage and were reassessed in a further 3 months (i.e. at 6 months).

Symptom improvement, activity and 'well-being' were measured using the 'Measure Yourself Medical Outcome Profile 2' (MYMOP2). Unlike many self-completed 'quality of life' questionnaires, which may not allow patients to express the outcomes that are important to them, MYMOP2 (and its predecessor, MYMOP) is an patient-generated questionnaire, which is responsive to changes that are important to the individual (Paterson and Britten, 2000; Paterson, 2004). MYMOP and MYMOP2 have been shown to be reliable, valid and highly responsive to change in the primary care and complementary therapy setting (Paterson, 1996; Paterson and Britten, 2000) and in people with acute exacerbations of chronic conditions (i.e. chronic bronchitis) (Paterson et al., 2000). MYMOP2 was therefore considered a particularly relevant tool to use to measure lymphoedema experience which is often unique (Williams et al., 2004). Furthermore, it is brief and simple to complete,

which enhances compliance and response and has been validated in both the orthodox and complementary medical environments (Paterson, 2005) MYMOP2 assessments took place at the same time as the limb volume measurements.

### Ethical considerations

Patients' normal treatment was not compromised in any way by their inclusion in this study. All were given written and oral information to consider before agreeing to take part and all gave written consent. Previous research has shown that people with cancer enjoy aromatherapy massage and may gain psychologically from it (Kirshbaum, 1996; Kite et al., 1998; Wilkinson et al., 1999; Fellowes et al., 2004). The study was approved by the Dorset Local Research Ethics Committee and Poole Hospital Research Governance Department. All treatment was administered and taught by qualified practitioners following the hospital's policy and Royal College of Nursing guidelines (Avis, 2003).

### Sample size

No data were available on which to base a formal sample size calculation. The study team felt that a sample size of 80 was feasible. This is sufficient to detect a standardized effect size of 0.73 with 90% power and 0.63 with 80% power (i.e. medium to large differences), using a 5% two-sided significance test.

### Statistical analyses

Data were analysed using SPSS for Windows software. A two-sided 5% significance level was used. The primary analysis was a comparison of the aromatherapy with the basecream alone group. If there was no statistically significant difference between the groups, we conducted further analyses exploring changes over the course of the study using both groups combined in order to maximize statistical power.

Upper limb volumes are summarized using median values and ranges due to skewed distribution with outliers; lower limb volumes are summarized as mean values and standard deviations because they are approximately normally distributed. Participants tended to have lymphoedema either in one arm or in both legs. Because of the obvious difficulties in analyzing changes in leg volume and changes in arm volume together, participants were assessed simply on whether or not they experienced a relative loss or gain in

volume from baseline to 3 months. For participants with lower limb volume, this was a loss or gain of the mean of the right and left volumes (although only one participant had a decrease in one limb and gain in the other). This outcome was compared between the two groups using the  $\chi^2$ -test for association, and within both groups combined using the binomial test with a test proportion of 0.50.

MYMOP2 measures three patient identified variables: symptom 1, symptom 2 and activity, plus wellbeing. The mean of the four scores produces a profile score. However, it was felt that this system of scoring was somewhat crude as symptom 2 and activity are optional and had not been scored by all participants. Furthermore, as the developer herself admits, a single score can result in loss of information (Paterson and Britten, 2000). For this reason, analysis concentrated on the obligatory variables of symptom 1 and wellbeing. These have been summarized as means and standard deviations and compared between groups using the independent samples *t*-test at each assessment point. Within both groups combined, change in outcome from baseline to each assessment point has been tested using the paired *t*-test.

## Results

### Baseline characteristics

Eighty-one participants between the ages of 25 and 80 were randomized into the study as detailed in Table 1.

Only one participant withdrew due to a skin reaction. Other reasons for withdrawal included non-attendance, concurrent illness and one pregnancy.

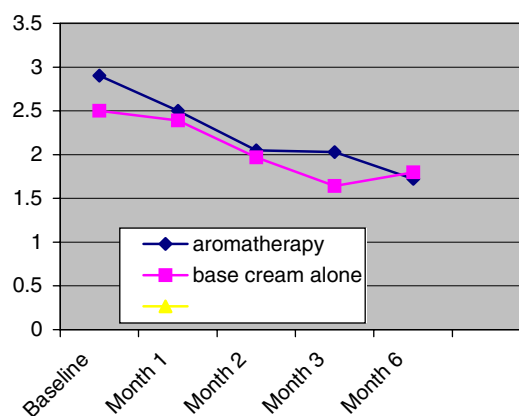
### Limb volume

In the aromatherapy group, 69% had a decreased limb volume at 3 months compared with 57% who received base cream SLD alone ( $P = 0.38$  using the  $\chi^2$ -test for association with continuity correction). With both groups combined, significantly

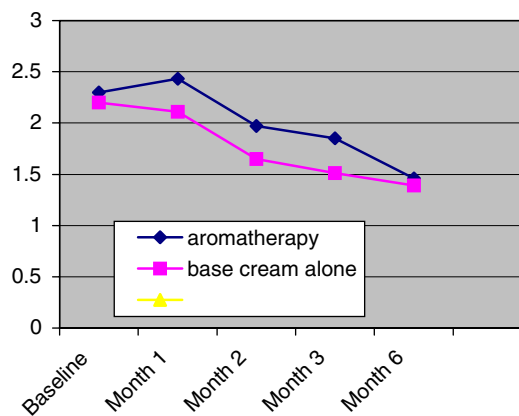
more participants improved than got worse (63% improved,  $P = 0.034$  using the binomial test) (Table 3).

### Symptoms and wellbeing

The addition of aromatherapy oils appeared to make comparatively little difference in terms of symptom relief or wellbeing (please see Graphs 1 and 2 and Table 4). The mean differences between base cream alone and aromatherapy at 3 months was 0.1 (95% confidence interval;  $-0.5, 0.6$ ) for



Graph 1 Change in MYMOP2 symptom 1 scores over time for the two groups.



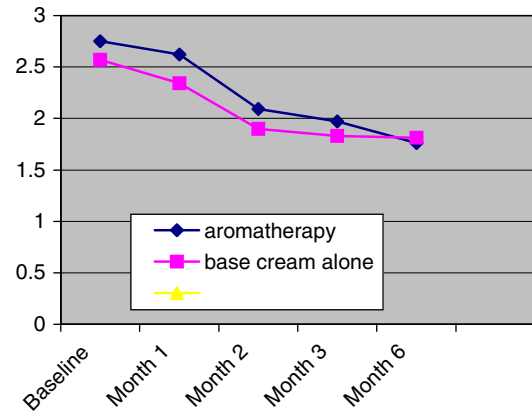
Graph 2 Change in MYMOP2 well-being scores over time for the two groups.

Table 3 Absolute limb volumes after 3 months treatment.

	Baseline	3 months
Median upper limb volume ( <i>min. volume/max. volume</i> )	107.0 (-372.0/2421.0)	60.0 (-334/2344)
Mean right lower limb volume ( <i>standard deviation</i> )	6218.3 (1772.5)	6057.1 (2093.0)
Mean left lower limb volume ( <i>standard deviation</i> )	6177.9 (1857.9)	5979.9 (2014.9)

**Table 4** Independent sample *t*-test comparing the mean change from baseline between the groups (BC = base cream, A = aromatherapy).

	Symptom 1			Wellbeing		
	Mean (SD)	Mean (SD) change from baseline	P-value	Mean (SD)	Mean (SD) change from baseline	P-value
	BC	BC & A	BC & A	BC	BC & A	BC & A
Baseline	2.5 (1.6)	2.9 (1.5)	=	2.2 (2.1)	2.3 (1.7)	=
Month 1	2.4 (1.6)	2.5 (1.6)	-0.1 (1.2)	2.1 (1.5)	2.4 (1.7)	-0.1 (1.6)
Month 2	2.0 (1.5)	2.1 (1.5)	-0.4 (1.3)	1.7 (1.3)	2.0 (1.3)	-0.5 (1.7)
Month 3	1.6 (1.2)	2.0 (1.4)	-0.8 (1.1)	1.5 (1.2)	1.9 (1.3)	-0.7 (1.6)
Month 6	1.8 (1.3)	1.7 (1.4)	-0.8 (1.6)	1.4 (1.3)	1.5 (1.3)	-0.5 (1.5)
			0.22			0.68
			0.14			0.58
			0.85			0.54
			0.17			0.71



**Graph 3** Change in MYMOP2 profile scores over time for the two groups.

**Table 5** Changes from baseline in symptom and wellbeing for both groups combined.

	Symptom 1			Wellbeing		
	Mean	SD	P-value	Mean	SD	P-value
Month 1	-0.3	1.2	0.07	0.0	1.4	0.93
Month 2	-0.6	1.2	<0.001	-0.4	1.4	0.02
Month 3	-0.8	1.2	<0.001	-0.6	1.4	0.002
Month 6	-1.1	1.4	<0.001	-0.6	1.3	0.003

symptom 1 (i.e. the improvement in the aromatherapy group was 0.1 points better than in the basecream alone group) and -0.2 (-0.9, 0.5) for wellbeing (i.e. the improvement in the aromatherapy group was 0.2 points worse than in the basecream alone group).

However, when both groups were combined, the profile scores revealed an overall reduction over time (please see Graph 3).

By month two, there had been significant improvements from baseline in symptom 1 and wellbeing scores for both groups combined, which continued over time (please see Table 5).

### Discussion

For the study population, there was a reduction in objective limb volume from baseline to 3 months with self-massage. Furthermore, patient-identified symptom relief and wellbeing significantly increased and this improvement continued to at least 6 months, in those who continued to self-massage. This part of the analysis was conducted within participants. There was no control group and the possibility that the participants may have improved

anyway cannot be excluded. However, the addition of aromatherapy did not appear to make any difference to these improvements. Aromatherapy slightly reduced limb volume and symptoms but these improvements were not statistically significant (the smallest *P*-value was 0.14). The limits for the 95% confidence intervals at 3 months suggest that it is unlikely that aromatherapy is better than basecream alone by more than 0.6 points on the symptom scale and 0.5 points on the well-being scale.

Nearly all patients approached agreed to take part in the study. Richardson (2000) claims that a patient's motivation to follow a treatment regimen, particularly one that involves their own participation, is influenced by preferences before the treatment is started. If those who chose to take part did hold a pre-existing bias, this may have influenced the positive outcome. Unfortunately no data was collected from those who refused to take part, in which to discuss this. Although all patients were taught how to self-massage by just one lymphoedema specialist nurse and their technique was checked at each monthly assessment, it is impossible to know how effectively this was carried out by each participant in their own environment. Undoubtedly, the study was not blinded, as the majority of participants would have been able to smell the presence or absence of aromatherapy oils in their cream. However, because of the inability to demonstrate significant differences in the aromatherapy versus basecream alone groups, it seems unlikely that the aromatherapy caused a placebo effect in this case.

Due to the difficulties in analyzing changes in lower limb and upper limb volumes together, limb volume was assessed by a simple loss or gain at 3 months. This did not take into account the relative loss or gain from baseline and may be criticized as unsophisticated. Although improvements from baseline limb volume were seen in this population at 3 months, they were not significant. However, Hardy and Taylor (1999) argue that, although limb volume is the most commonly accepted outcome measure, it should not necessarily be seen as the most important gauge of treatment success or failure. Furthermore, Box et al. (2002) found disparities between objective measurements of limb volume and subjective reporting of secondary lymphoedema. They argue that subjective reporting should not be discounted because of the psychological and emotional distress that lymphoedema can cause and suggest that subjective reports may actually precede objective increases in limb volume. Furthermore, a very small change in volume may have a great impact on mobility or

body image. The aromatherapy oils were chosen for their particular lymphatic-stimulation, anti-inflammatory and analgesic properties and it may have been prudent to have also included a measure of skin condition or sensitivity to detect differences between the two groups.

MYMOP2 appears to have been a successful tool for assessing symptoms and wellbeing associated with lymphoedema and its treatment. Patients liked its brevity and felt it was more 'personal' because they were able to incorporate the symptoms and activities that concerned them. Compliance was very good with 71 of the 81 providing complete data at 3 months. Unfortunately, 21 patients withdrew at or after 3 months, the main reason being a loss of enthusiasm due to little or no subjective benefit. Therefore valid data was only available for 50 cases at 6 months and, as a result, limb volume was not analysed at this time point. However, participants were asked to complete a MYMOP2 assessment at this time as symptom relief and wellbeing had shown a more significant improvement at 3 months and, for these patients, improvement continued.

It may be argued that these improvements in symptom relief and wellbeing were unlikely to be of clinical significance as they show only fractional improvements on a seven-point scale. However, even a small gain may be very relevant in this population. Howell and Watson (2005) report an overall worsening of quality of life in their pilot study of women with lymphoedema secondary to breast cancer and suggest that this may be due to the realization over time that lymphoedema requires life-long management and cannot be entirely eliminated.

The results of this study do not concur with other randomized controlled trials of massage versus massage with aromatherapy in the treatment of people with cancer, which report more positive effects for aromatherapy (Corner, 1995; Wilkinson et al., 1999). This may have been due to this specific population or the aromatherapy oils used here. It may also have been due to the outcome measures as Corner and Wilkinson and colleagues concentrated more on anxiety-type symptoms whereas this study assessed wellbeing and patient-identified symptoms which focused on pain and discomfort, mobility and body image issues.

A criticism leveled at studies involving people with lymphoedema is that they concentrate on people who have cancer, particularly breast cancer (Hardy and Taylor, 1999). This study's population included people with both benign and malignant causes of lymphoedema. However, this also reduced the number in each causal group and

weakened analysis based on this. If this study's sample had been larger or had been drawn from a population with only one type or site of lymphoedema, the results may have been more meaningful, albeit exclusive.

## Conclusion

Self-massage, following the principles of lymphatic drainage, and skin care/hydration significantly improved patient-identified symptom relief and wellbeing for this sample of people with primary and cancer-related secondary lymphoedema. It also slightly, but not significantly reduced limb volume. However, aromatherapy oils, carefully chosen on the basis that they should benefit this group, did not appear to influence any improvement in these measures.

## Acknowledgements

Statistical advice was sought from Professor Peter Thomas, health care statistician, at the Dorset Research and Development Support Unit. We are very grateful for his help and supervision. Thank you very much to all the people referred to the Dorset Cancer Centre Lymphoedema Service who agreed to take part in this study.

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