

AT614: Foundations of Sports Injury Rehabilitation Annotated Rehabilitation Evidence Assignment #1

Preston N, Seers, K, Mortimer, PS. Physical therapies for reducing and controlling lymphoedema of the limbs. *Cochrane Database of Systematic Reviews*. 2008;1-32.

Often a co-morbidity seen with cancer patients, lymphoedema is a condition that can have significant negative physical and psychological implications. Specifically, the swelling associated with lymphoedema may inhibit mobility and affect a patient's perspective of themselves due to an increased size of the affected limb. Currently, the most effective physical treatment at reducing lymphoedema in the extremities is unknown. The purpose of this systematic review is to assess the effect of physical treatment programs on volume, shape, condition, and long-term control of edema on lymphoedematous limbs, and to determine any psycho-social benefits of treatment.

Types of studies considered for review included randomized controlled clinical trials that tested physical therapies with a follow-up period of at least six months. All studies recruited subjects over the age of 18 who had been diagnosed with lymphoedema, defined as clinically detectable edema from a peripheral cause of greater than three months duration. Types of intervention found in the literature included multi-layer bandaging, skin care, manual lymph drainage (MLD), exercise-promoting lymph drainage, and pneumatic compression therapy (PCT). Outcome measures utilized included volume measurements of the limbs, impact on quality of life, impact on a patient's sense of well-being, impact on patient's mobility, and reduction of recurrent infections. The databases used to search for relevant literature include Cochrane Breast Cancer Specialized Register, Cochrane Central Register of Controlled Trials, CINAHL, MEDLINE, EMBASE, and the National Research Register. BNI, CANCERLIT, British Library Index, UnCover, and the International Society of Lymphology biennial congress proceedings. After retrieving relevant literature, two reviewers independently assessed the documents' eligibility for inclusion based on a piloted eligibility form.

Only three studies involving 150 randomized patients met inclusion criteria. The results of these studies could not be pooled because interventions varied. One crossover study of MLD found it had no benefits and that compression sleeves were helpful in reducing edema. A second study using hosiery versus no treatment had a high dropout rate, yet the authors concluded wearing a compression sleeve is beneficial. A third study concluded that using bandaging plus hosiery resulted in a greater reduction of excess limb volume than hosiery alone. According to the AAOS, the level of evidence is consistent with Level III. The strength of recommendation (SORT) is a level (2)B study. Total quality of the systematic review was a 23/48.

Although patients seen by athletic training clinicians in traditional settings will typically not be suffering from cancer-related lymphoedema, the likelihood of treating patients with edema of the limbs from acute trauma or post-surgical sequelae is high. Although the studies included in this systematic review were few and of poor quality, if nothing else, because of its ease and cost-effectiveness, patients seen by athletic training clinicians who are suffering from chronic edema can be encouraged to wear compression sleeves or hosiery to reduce limb size which will hopefully facilitate a higher degree of functionality in athletic activities.

1. Why was the study done (what was the research question)?

Lymphoedema is a common complication resulting from cancer and its treatment, congenital abnormalities of the lymphatic system, chronic venous disease, and parasitic infection. Despite its prevalence, there are debates as to which clinical intervention is most effective at reducing the negative physical and psychological effects associated with lymphoedema. Specifically, the purpose of this study was to assess the effect of treatment programs on the volume, shape, condition, and long-term control of lymphoedematous limbs and to determine whether there were any psycho-social benefits of the physical treatment.

2. Is it a systematic review of high-quality studies which are relevant to your question?

No; overall, the quality of the three studies was poor. Of the 195 papers found for possible inclusion, 185 were found ineligible, as they were not randomized controlled trials. Of the three studies included for review, none reported method of randomization. Additionally, one of the studies had only three patients remaining at the end of the study, gave no reason for subject attrition, provided no information about the outcome tool used, and provided no information on the scale used for subjective pain measurement.

3. Did it describe a comprehensive search for all relevant studies?

Yes; ten different databases were examined for potentially usable studies. Additionally, international experts in the field were contacted for any related data that was not yet published. All 353 members of the International Society of Lymphology were contacted by letter to ask whether they had results of past or ongoing studies that could be considered for review. Only 30 replies were received and none provided appropriate data for use in the review.

4. Were the criteria for study inclusion predetermined and clearly stated?

Yes; inclusion criteria constituted only randomized controlled clinical trials utilizing subjects 18 years of age and older who had been diagnosed with clinically detectable edema resulting from a primary condition that was greater than three months in duration. Follow-up had to be at least six months. In patients with unilateral edema, the increase in limb volume of the swollen limb had to be at least 10% above that of the contra-lateral normal limb volume. Both cancer-related and non-cancer-related lymphoedema were included in the study. Types of intervention included were multi-layered bandaging, hosiery, exercise, manual lymph drainage, pneumatic compression therapy, simple lymph drainage, and self-administered massage. Main outcome measures included in the study were: volume measurement of the limbs by water displacement, electronic volumeter, calculated from surface measurements; and impact on the patient's quality of life, sense of well-being, mobility, and the reduction in recurrent infections.

5. Did the authors adequately assess the quality of the included studies?

No; the authors designed and piloted a data extraction form before use on the selected papers. Data extraction was then duplicated by a second reviewer and any disagreements in data extraction were then resolved by a third reviewer. While the method of data extraction may have been consistent, no information was provided as to the process these authors took to ensure methodological soundness of each of the studies included in the review.

6. What were the results of the review?

Because the study design and intervention-type was different for each of the studies, the results could not be combined. One crossover study of MLD found that it had no benefits and that compression sleeves were helpful in reducing edema. A second study using hosiery versus no treatment had a very high dropout rate, yet the authors concluded wearing a compression sleeve is beneficial. A third study concluded that using bandaging plus hosiery resulted in a greater reduction of excess limb volume than hosiery alone. Overall, intervention using some method of compression seemed to have positive long-term effects on edema reduction.

7. How precise are the results?

Based on poor study design and quality of the studies included in this systematic review, the results cannot be considered precise.

**8. Did the interpretation of the review's results accurately reflect the results themselves?
Are the results generalizable?**

Yes; it is accurately interpreted that the limitations in the designs of the studies under review make it difficult to make any conclusive convictions on the most appropriate physical intervention for long-term control of lymphoedema.