Therapy modalities to reduce secondary lymphedema in female breast cancer patients: a systematic review and meta-analysis

Slavko Rogan¹,², Jan Taeymans¹,³ Helena Luginbühl¹,⁴, Martina Aebi¹, Sarah Mahnig¹, Nick Gebruers⁴

¹Bern University of Applied Science, Health, Bern, Switzerland
²Academie for integrative Physiotherapy and Education, Grenzach-Wyhlen, Germany
³Vrije Universiteit, Faculty of Physical Education and Physiotherapy, Brussel, Belgium
⁴University Antwerp, Rehabilitation Sciences & Physiotherapy, Antwerp, Belgium
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THERAPY MODALITIES TO REDUCE SECONDARY LYMPHEDEMA IN FEMALE BREAST CANCER PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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1. Background

Breast-cancer related lymphedema is a disruption in the lymphatic transport system due to surgery or radiation (1). Chronic inflammation, imbalance in tissue pressure, mechanical insufficiency, and decreased shoulder immobility occurs as a result of the disruption (2). This condition leads to a deterioration of quality of life. A prevalence of lymphedema varies between 0 to 34%.

The consensus document of the International Society of Lymphology for evaluation and managing peripheral lymphedema (http://www.u.arizona.edu/~witte/2009consensus.pdf) described the following treatment techniques for lymphedema reduction: manual lymphatic drainage and bandages and active exercise and lymphtape.

Until now, none review evaluated precisely the reduction of oedema after a comprehensive treatment according to the consensus document. Therefore a systematic review was conducted to provide an overview of the effects of manual lymphatic drainage and bandages and active exercise and lymphtape on the reduction of lymphedema in breast cancer patients.

2. Research question

The research question is, what are the effects of compression bandages and active exercise in the reduction of lymphedema in breast cancer patients?
3. Methods

3.1. Searching design

Following databases was conducted until December 2015:

1. CINAHL
2. Cochrane
3. Embase
4. PubMed
5. PEDro
6.

3.2 Search strategy

<table>
<thead>
<tr>
<th>P</th>
<th>&quot;lymphedema&quot;[MeSH] OR arm volume OR lymph*edema OR arm oedema AND &quot;breast neoplasms&quot; [MeSH] OR «breast cancer» OR «breast carcinoma» OR «mastectomy OR «axillary lymph node dissection»</th>
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<tr>
<td>I</td>
<td>AND exercise [MeSH] OR &lt;&lt;exercise&gt;&gt; OR &lt;&lt;exercises&gt;&gt; OR &lt;&lt;weight lifting&gt;&gt; OR &lt;&lt;physical activity&gt;&gt; OR &lt;&lt;physical training&gt;&gt; OR &lt;&lt;resistance training&gt;&gt; OR «elastic taping» OR «elastic tape» OR «lymph taping» OR «lymph tape» OR «kinesio* taping» OR «kinesio* tape» OR «no intervention» OR «compression bandage» OR «compression bandaging» OR &lt;&lt;compression sleeve&gt;&gt; OR &lt;&lt;elastic bandage&gt;&gt; OR &lt;&lt;elastic bandaging&gt;&gt; OR «complex physical decongestive therapy» OR «complex physical therapy» OR «manual lymphatic drainage therapy» OR «manual lymphatic drainage» OR «manual lymph drainage» OR «mechanical lymphatic drainage»</td>
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<td>C / O</td>
<td>AND &quot;quality of life&quot; [MeSH] OR «quality of life» OR «satisfaction with surgery» OR &lt;&lt;QOL&gt;&gt; OR «volume» OR «extracellular fluid» OR «circumference» OR «lymphostasis» OR «reducing lymph<em>edema» OR «reduce lymph</em>edema» OR «*edema related symptoms» OR «*edema related pain» OR «shoulder mobility» OR «shoulder ROM» OR «shoulder arm morbidity» OR «arm function»</td>
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Pubmed

("lymphedema"[MeSH] OR arm volume OR lymph*edema OR arm oedema) AND
("breast neoplasms" [MeSH] OR «breast cancer» OR «breast carcinoma» OR
«mastectomy» OR «axillary lymph node dissection» OR <<breast cancer-related lymphedema>>) AND
(exercise [MeSH] OR «exercise» OR «exercises» OR <<weight lifting>> OR <<physical activity>> OR <<physical training>> OR <<resistance training>> OR «elastic taping» OR «elastic tape» OR «lymph taping» OR «lymph tape» OR «kinesio* taping» OR «kinesio* tape» OR «no intervention» OR «compression bandage» OR «compression bandaging» OR «lymphatic drainage therapy» OR «complex physical decongestive therapy» OR «complex physical therapy» OR «manual lymphatic drainage therapy» OR «manual lymphatic drainage» OR «manual lymph drainage» OR «mechanical lymphatic drainage») AND
("quality of life" [MeSH] OR «quality of life» OR «satisfaction with surgery» OR <<QOL>> OR «limb volume» OR «extracellular fluid» OR «circumference» OR «lymphostasis» OR «reducing lymph*edema» OR «reduce lymph*edema» OR «*edema related symptoms» OR «*edema related pain» OR «shoulder mobility» OR «shoulder ROM» OR «shoulder arm morbidity» OR «arm function») AND
("systematic review» OR «meta-analysis» OR «randomized controlled trial» OR «cross-sectional and longitudinal study» OR «cohort study» OR «clinical trial» OR <<pilot study>> OR «single case study» OR «case report»)

Cochrane

("lymphedema"[MeSH] OR arm volume OR lymph*edema OR arm oedema) AND
("breast neoplasms" [MeSH] OR «breast cancer» OR «breast carcinoma» OR
«mastectomy» OR «axillary lymph node dissection» OR <<breast cancer-related lymphedema>>) AND
(exercise [MeSH] OR «exercise» OR «exercises» OR <<weight lifting>> OR <<physical activity>> OR <<physical training>> OR <<resistance training>> OR «elastic taping» OR «elastic tape» OR «lymph taping» OR «lymph tape» OR «kinesio* taping» OR «kinesio* tape» OR «no intervention» OR «compression bandage» OR «compression bandaging»)
sleeve>> OR <<elastic bandage>> OR <<elastic bandaging>> OR «complex physical decongestive therapy» OR «complex physical therapy» OR «manual lymphatic drainage therapy» OR «manual lymphatic drainage» OR «manual lymph drainage» OR «mechanical lymphatic drainage») AND ("quality of life" (MeSH) OR «quality of life» OR «satisfaction with surgery» OR <<QOL>> OR «limb volume» OR «extracellular fluid» OR «circumference» OR «lymphostasis» OR «reducing lymph*edema» OR «reduce lymph*edema» OR «*edema related symptoms» OR «*edema related pain» OR «shoulder mobility» OR «shoulder ROM» OR «shoulder arm morbidity» OR «arm function») AND («systematic review» OR «meta-analysis» OR «randomized controlled trial» OR «cross-sectional and longitudinal study» OR «cohort study» OR «clinical trial» OR <<pilot study>> OR «single case study» OR «case report»)

Pedro
Keyword: lymph*edema AND breast cancer

Embase
lymphatic OR drainage OR exercise OR manual AND lymphatic AND drainage OR resistance AND training OR elastic AND taping OR elastic AND tape OR lymph AND taping OR lymph AND tape OR kinesio* AND taping OR kinesio* AND tape OR no AND intervention OR compression AND bandage OR compression AND bandaging OR compression AND 'quality of life' AND mesh OR quality AND of AND life OR satisfaction AND with AND surgery OR qol OR limb AND volume OR extracellular AND fluid OR circumference OR lymphostasis OR reducing AND lymph*edema OR reduce AND lymph*edema OR edema AND related AND symptoms OR edema AND related AND pain OR shoulder AND mobility OR shoulder AND rom OR shoulder AND arm AND morbidity OR arm AND function AND systematic AND review OR 'meta analysis' OR randomized AND controlled AND trial OR 'cross sectional' AND longitudinal AND study OR cohort AND study OR clinical AND trial OR pilot AND study OR single AND case AND study OR case AND report

28.11.14: 97 Results

CINAHL
(lymph*edema OR arm volume OR arm edema) AND (breast neoplasms OR breast cancer OR breast carcinoma OR mastectomy OR axillary lymph node dissection OR breast cancer-related lymphedema) AND (exercis* OR weight lifting OR physical activity OR physical training OR resistance training OR elastic taping OR elastic tape OR lymph taping OR lymph tape OR kinesio* tapering OR kinesio* tape OR no intervention OR compression bandage OR compression bandaging OR compression sleeve OR elastic bandage OR elastic bandaging OR complex physical decongestive...
therapy OR complex physical therapy OR manual lymphatic drainage therapy OR manual lymphatic drainage OR manual lymph drainage OR mechanical lymphatic drainage) AND (quality of life OR satisfaction with surgery OR QOL OR limb volume OR extracellular fluid OR circumference OR lymphostasis OR reducing lymph*edema OR reduce lymph*edema OR edema related symptoms OR edema related pain OR shoulder mobility OR shoulder ROM OR shoulder arm morbidity OR arm function)
4. Study selection

Five reviewers (SR, JT, MA SM, NG) screened title and abstract and in the next round the full text. Eligible criteria: RCT and non RCT and the studies examined the effects of manual lymphatic drainage and bandages and active exercise and lymph tape in the reduction of lymphedema in breast cancer patients.

PICO: (P) female or women or SAL or breast cancer or mastectomy or axillary dissection (I) the nature of the intervention is to reduce oedema circumscribed, (C) type of intervention in the control group is described, (O) one of the variable volume, scope, shoulder mobility, pain, QOL or functional arm movements, oedema reduction. With unclear information in the abstract, the full text was read.

A study was excluded, when the effect of (a) drugs, hormones, radiation and surgical procedures was examined. Also excluded were studies with (b) children in the test groups, (c) cancers, which do not affect the chest, (d) edema of the lower extremity (s) impact of an intervention on the Fatigue, (f) diets or sexually transmitted diseases, (g) investigation deviations to the cost and (h) syndromes that are not carcinogenic nature, or (i) investigate the prevention of breast cancer.

5. Data extraction and methodology quality

Two reviewers (SR, HL) assessed independently the methodology quality with “the Cochran Collaboration’s tool for assessing risk of bias” and abstracted the following information from each included study: 1) design and sample, 2) treatment modalities, 3) treatment parameters, 4) change in lymphatic edema reduction, 5) conclusion of the studies.
## 6. Time table

<table>
<thead>
<tr>
<th>Date</th>
<th>Work</th>
<th>Author</th>
</tr>
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<tbody>
<tr>
<td>Till December 2015</td>
<td>Management systematic review</td>
<td>SR, JT</td>
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<td>Till February 2016</td>
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<td>Till June 2016</td>
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<td>SR, HL</td>
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<tr>
<td>Till June 2016</td>
<td>Writing</td>
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<tr>
<td>End July 2016</td>
<td>Final check</td>
<td>all</td>
</tr>
<tr>
<td></td>
<td>Submit manuscript to journal</td>
<td>SR</td>
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7. Reference
