Physiotherapy Management for Breast Cancer Related Lymphedema (BCRL): An Evidence Based Study

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ABSTRACT

Breast cancer is the most frequent malignancy in women. Lymphedema is a significant health issue for cancer survivors. It affects 21.4%, indicating 1 in every 5 patients following breast cancer treatment. Problems associated with lymphedema include pain, altered sensation, such as discomfort and heaviness, difficulty with physical mobility, psychological distress, recurrent infections and social isolation. So, lymphedema management in breast cancer survivors is used in the field of rehabilitation to improve patient’s functional abilities. Physiotherapy treatment should include Compression bandage, Active Resistive Exercise with Complex Decongestive Physiotherapy, Low Level Laser Therapy (LLLT), Physical Exercise (Aqua lymph training, Swimming, Yoga, Aerobic), Kinesiological Taping (KT). BCRL is chronic (ongoing) condition. Advance Pneumatic compression device (APCD) is used for home maintenance phase. We have reviewed the available literature on Breast cancer related lymphedema to explore the best management strategies.

Keywords: Breast cancer related Lymphedema, A systematic review, Physical exercise, Manual lymphatic drainage, Pneumatic compression, Low level laser therapy, Kinesiological Taping

INTRODUCTION

Cancer is a disease caused when cell divide uncontrollably and spread into surrounding tissues.¹ Nowadays, breast cancer is most frequent malignancy in women, with an incidence of 35-44 new cases 100,000 women per year.² There are several different types of treatments for breast cancer included, Mastectomy, Axillary lymph node dissection(ALND) and Regional lymph node radiation.³ There are several potential side effects of breast cancer treatment such as pain and discomfort, infection, lymphedema, seroma etc.⁴ Lymphedema is a significant health issue for cancer survivors.⁵ In a recent meta-analysis, the overall estimated incidence of chronic arm oedema after breast cancer treatment was found to be 21.4%, indicating that BCRL is a widespread problem affecting 1 in every 5 patients following breast cancer treatment.⁶ BCRL results from disruption to the lymphatic system that prevents adequate drainage from lymphatic vessels causing protein-rich lymph fluid to accumulate in the interstitial space.⁷ Problems associated with lymphedema includes pain, altered sensation, such as discomfort and heaviness, difficulty with physical mobility, psychological distress, recurrent infections and social isolation.⁸

Physiotherapy treatment of BCRL, several methods have been used with varying results.⁹ Compression bandage, Active resistive exercise with complex decongestive physiotherapy, Physical exercise(Aqua lymph training, swimming, yoga, aerobic), Kinesiological taping, Low level laser therapy(LLLTT) and Advanced pneumatic compression device(APCD) – all are used for management and home
maintenance phase of BCRL. Treatment outcomes are measured by volumetric measurement or circumferential measurement at baseline and at the end of treatment phase. Evidence based research is needed to document the therapeutic effect of different technique in various presentation.

**INCLUSION CRITERIA FOR ARTICLES**

- Articles were published in last 10 years. (2009 to 2019)
- The articles that includes subjects with breast cancer related lymphedema (BCRL).
- The articles that includes physiotherapy intervention for management of BCRL.
- Circumferential or volumetric measurement as one of the primary outcome measure.

**EXCLUSION CRITERIA FOR ARTICLES**

- Articles were published before 10 years.
- The articles that includes subjects with lymphedema due to another condition.

**METHODOLOGY**

In order to collect evidences for the effectiveness of physiotherapy intervention on lymphedema, articles were searched and gathered. The articles were searched in Google scholar, PubMed, Elsevier, Cochrane library by using keywords like Breast cancer related Lymphedema, A systematic review, Physical exercise, Manual lymphatic drainage, Pneumatic compression, Low level laser therapy, Kinesiological Taping. The articles were taken from Bio Med Control (BMC), Breast cancer Research and Treatment, World Journal of Surgical Oncology, Oncology Research and Treatment, Archives of Physical Medicine and Rehabilitation, An International Journal of Physical Therapy, Support care cancer and Journal of Vascular Surgery.

<table>
<thead>
<tr>
<th>Author</th>
<th>Sample design/ no. Of articles and subjects</th>
<th>Intervention</th>
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<tr>
<td>G. David Baxter et al. (2017)</td>
<td>A Systematic review of Low-level laser therapy (LLLT) for BCRL (7 RCTs were analysed)</td>
<td>Study group received LLLT with most common wavelength used was 904 nm and energy densities were 1.5 J/cm² and 2.4 J/cm² at the cubital fossa and the axillary region; control group received no treatment or any active treatment other than LLLT for 3 treatment/week, variation in duration from 4 to 12 weeks.</td>
<td>Primary outcome measures were limb circumference/volume, and secondary outcomes included pain intensity and range of motion.</td>
<td>LLLT in the management of BCRL is more effective for limb oedema reduction than sham and no treatment at a short-term follow-up, and not more effective than other conventional treatments.</td>
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<td>Yi Shao et al. (2014)</td>
<td>A Systematic review and Meta-Analysis of Intermittent Pneumatic Compression Pump (IPC) for BCRL ( 7 RCTs with 287 patients were included)</td>
<td>Experimental group received IPC with 40 – 60 mmHg pressure for 20 min to 2 hours; control group received Decongestive lymphatic therapy or manual lymphatic drainage without IPC for variation in duration from 10 days to 15 weeks.</td>
<td>Primary outcome was the percent of volume reduction. Secondary outcomes were subjective symptoms and joint mobility.</td>
<td>This trials fail to show the effectiveness of the addition of an IPC to the routine management of BCRL.</td>
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<td>Tsai-Wei Huang et al. (2013)</td>
<td>A Systematic review and Meta-analysis of Manual Lymphatic Drainage (MLD) On BCRL (10 RCTs with 566 patients were analysed)</td>
<td>Intervention group received conventional therapy with MLD. Control group received conventional therapy like, ICP, Bandage compression, Massage, Exercise without MLD for variation in duration from 2 weeks to 4 weeks.</td>
<td>The primary outcome for prevention was the incidence of post-operative lymphedema. The outcome for management of lymphedema was a reduction in oedema volume.</td>
<td>This trial does not found significant difference in the incidence of lymphedema in patients treated with or without MLD.</td>
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CONCLUSION
There are different levels of evidences found of physiotherapy intervention for BCRL. It can be concluded that there is a strong evidence supporting the reduction in arm volume by using Low level laser therapy (LLLT), Kinesio taping (KT) and Physical exercise. There are moderate evidence suggesting Active Resistive exercise as an adjunctive method and Compression Bandage with lower pressure (20-30 mmHg) for lymphedema reduction. Advanced Pneumatic Compression device (APCD, Flexi touch system HCPCSEO652) is used for home maintenance phase of treatment of arm lymphedema. There are strong evidence suggesting Manual Lymphatic Drainage (MLD) and Intermittent Pneumatic Compression (IPC) not effective for management of lymphedema.

CONFLICT OF INTREST
There was no personal or institutional conflict of interest for the study.

SOURCE OF FUNDING
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