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EFFECTS OF PHYSIOTHERAPY ON BREAST CANCER RELATED SECONDARY LYMPHEDEMA: A SYSTEMATIC REVIEW

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ABSTRACT:

Purpose: The aim of this systematic review is to assess the effect of Physiotherapy Rehabilitation on breast cancer-related lymphedema (BCRL) in order to elucidate the role of Physiotherapy in these patients.

Methods: A systematic data search was performed using Google scholar, PubMed (from January 2002 till October 2018). The review is focused on the rehabilitative aspect of BCRL and undertaken according to the PRISMA statement with Levels of Evidence (LoE) assessed.

Results: 13 randomized controlled trials that included 158 women with breast cancer in after care were included. The included articles were the intervention studies of the effect of physiotherapy with different types of physiotherapy regimens i.e exercise consisted of aqua lymph training, swimming, resistance exercise, yoga, aerobic, and gravity-resistive exercise. All the included articles were critically analyzed and included in this review.

Conclusion: The evidence indicates that Physiotherapy can improve subjective and objective parameters in BCRL patients although it is found to be helpful in improving the quality of life of these patients.

Keywords: Breast cancer, Physiotherapy, Lymphedema

Introduction

According to recent statistics, breast cancer is most common cancer in women worldwide [1]. Although there have been substantial improvements in early detection, diagnosis, treatment, and reduction of complications, side effects of the cancer itself and also its treatment remain [2]. These may include fatigue, weakness, loss of muscle extensibility, limited shoulder range of motion, upper-body pain, pulmonary complications, neuropathy, decreases in lean mass and concomitant increases in fat mass, and BCRL [3].

BCRL is one of the most common side effects of the cancer itself or its treatments. The BCRL arises as a result of fluid accumulation in the interstitial tissue due to damage of the lymphatic system, induced by surgery and/or radiation, or tumor-induced neo-lymph angiogenesis [4]. The majority of women undergoing axillary intervention develop swelling within 2 years [5]. The development of BCRL is further increased by risk factors such as obesity, axillary lymph node dissection, extensive surgery, and radiotherapy to the regional lymph nodes [4]. Patients with BCRL typically suffer from a swollen upper limb, with concomitant feelings of weakness, heaviness, discomfort, and pain. Furthermore, there is an increased risk of infection and a chronic, progressive course of disease, leading to psychosocial distress and impaired quality of life (QoL) [5]. Treatment of BCRL typically consists of a multimodal therapy approach, including complex decongestive medicine, physiotherapy, and skin care [6]. Although previous studies have

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indicated numerous positive benefits of exercise in breast cancer treatment such as improvements in physical performance, body composition, and quality of life along with an acute and chronic reduction in fatigue. The lack of clinical recommendation for exercise programs along with the symptoms of BCRL often leads to insecurity of patients and physical activity avoidance. The resulting vicious cycle in which sedentary subjects tend to increase body mass, leads to an undesired progression of the disease because overweight and obesity are considered as risk factors for the development of lymphedema. Therefore, the American Cancer Society recommends that primary care clinicians should counsel survivors on how to prevent or reduce the risk of BCRL, including weight loss for those who are overweight or obese and the role of an individual tailored exercise program [7]. A number of studies have been published that have investigated the effect of exercise on BCRL and, as a result, the effects of resistance exercise on BCRL have already been extensively reviewed [8-10]. However, to the best of our knowledge, previous reviews have not concluded the effect of physiotherapy on BCRL and hence there is a need to know whether the physiotherapy rehabilitation is found to have some positive effects on BCRL or not.

Methods

A systematic PubMed search was conducted in January 2017, and studies were considered from January 2002. Key words searched included 'breast cancer-related lymphedema OR lymphedema' AND effects of physiotherapy on Breast cancer related lymphedema. Further terms used were 'breast cancer,' 'prevention,' 'physical activity,' 'physical exercise,' 'physical fitness,' 'exercise program,' 'exercise intervention,' 'moving therapy,' 'sports therapy,' 'sport,' 'endurance,' 'aerobic training,' 'resistance training,' 'strength training,' and 'strength.' Included studies focused on women of all ages and nationalities that were undergoing BCRL. The inclusion and exclusion criteria for selected articles are outlined in Table 1. The intervention had to involve a form of physical activity for women who are already suffering from BCRL. Studies that had a preventive approach or that included both women with BCRL and women those were at risk for BCRL were excluded from the study.

Table 1: Study inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Diagnosis is breast cancer	Preventive therapy or mixed approach
Diagnosis BCRL	Studies published before 2000
Randomised controlled studies	
Women	
Any kind of exercise	
Published in English	

In addition, studies that were not published in English were excluded. This review focused on outcome measures that presented the role and importance of physiotherapy on Lymphedema and it focuses on the cases of BCRL. The review was aligned to the preferred reporting items for systematic reviews and meta-analyses (PRISMA) process [11]. The search was performed by independent reviewer (Dr. Haque). In addition, the quality of the 13 identified publications has been assessed with respect to the levels of evidence. For this purpose, the American Society of Clinical Oncology (ASCO) criteria for the assessment of the evidence (LoE) were used and carried out [10].

Levels of evidences:

I: Meta-analyses of RCTs

IA: RCT of breast cancer survivors

IB: RCT based on cancer survivors across multiple cancer sites

IC: RCT not based on cancer survivors but on general population experiencing a specific long-term or late effect

(e.g., managing menopausal symptoms, sexual dysfunction, etc.)

IIA: Non-RCTs based on breast cancer survivors

IIB: Non-RCTs based on cancer survivors across multiple sites

IIC: Non-RCTs not based on cancer survivors but on general population experiencing a specific long-term or late effect

III: Case–control study or prospective cohort study

0: Expert opinion

Results

A total of 42 studies were identified and were filtered by "clinical trial," "English language," and "female." Following this, 29 studies were excluded and 16 were selected for abstract- or full-text-analysis. From these, 13 articles were included in this systematic review that comprised a total number of 158 patients. The studies were published between 2002 and 2018 and the study sample sizes ranged from 14 to 151 patients. All women included in the trials had been diagnosed with BCRL at study entry and had completed the primary therapy for breast cancer. The average age of the women was 56 years, and the intervention period ranged from 8 weeks up to 1 year. The number of training sessions varied between one and seven sessions per week. All interventions were at least initially supervised. Measurements in all trials were undertaken at baseline and at different times during and after the interventions. Arm volume and arm circumference were assessed in all of the included trials. One or more evaluation methods were used in the studies: limb circumference measurements were undertaken in six studies. All included studies had a controlled randomized study design and included women with pre-existing BCRL. Of the 13 studies, only two had both the participants and assessors blinded and two studies did not mention any blinding. The summary of the included articles are as follows:

Table 2:

Author	Design	Purpose	Conclusion
Robyn C. Box et al. 2002 (15)	RCT	To determine the effects of physiotherapy on post surgery breast cancer Lymphedema	A significant reduction in development of secondary Lymphedema has been concluded.
Marianne Eurertz et al. 2011 (16)	RCT	To conclude the effect of physiotherapy on Lymphedema as secondary complication of Breast cancer surgery	Positive effects of physiotherapy on Lymphedema was concluded
Nela Devooget et al. 2018 (17)	RCT	Effect of physiotherapy on Upper limb volume on post cancer breast surgery	Reduction in the girth of the affected limb was concluded
Bolette S Rafn et al 2018 (18)	Pilot, RCT	Effect of physiotherapy on Lymphedema on Quality of life of the patient	Improvement in the Quality of life of the patients
Freek T. Baumann et al. 2018 (19)	RCT	Effect of physiotherapy intervention on Upper limb weight on post cancer breast cancer surgery patients	Reduction in the weight of the limb was found

Schmitz et al. 2010 (20)	RCT	To assess the upper limb girth after rehabilitation in BCRL cases	Physiotherapy was found to be effective
Torres Lacomba et al. 2010 (21)	RCT	Pre and post Surgery effects of physiotherapy on BCRL	It limits the lymphedema and hence give positive results
Zimmer mann et al. 2012 (22)	RCT	Effect of physiotherapy on Upper limb volume on post cancer breast surgery	It reduces the volume and hence found to be beneficial
Devoogdt et al. 2011	RCT	Effect of physiotherapy intervention on Upper limb weight on post cancer breast cancer surgery patients	It reduces the upper limb girth.
Zhang et el. 2016 (15)	RCT	Effect of physiotherapy intervention on Upper limb weight on post cancer breast cancer surgery patients	It has positive effects post intervention.
Sinead Cobbe et al. 2017	RCT	Complex decongestive therapy as a regimen as a part of physiotherapy rehabilitation for lymphedema patients	CDT therapy was found to be effective on Lymphedema
Maria Torres Lacomba et al. 2010	RCT	Early physiotherapy treatment for pre and post of BCRL patients	Physiotherapy was found to be effective
Donald C. Mckenzie 2014	RCT	Effect of progressive upper limb exercise program	Progressive upper limb exercise was found to be effective

Discussion:

To the best of our knowledge, this is the first systematic review that has considered the effects of different types of physical exercise as a part of physiotherapy rehabilitation on women suffering from BCRL. Within the 13 included studies, we found all the included studies concludes the positive effect of physiotherapy regimens on BCRL patients. The findings of the present systematic review demonstrate that physical exercise improve BCRL state. To the best of our knowledge, this systematic review is the first to summarize the effects of different types of physical exercises on BCRL and was produced according to the guidelines of PRISMA [11]. We believe this paper provides excellent grounds for supporting guidelines on the role of exercise in women with BCRL. As the studies summarized in this review were published from 2002 to 2018, the findings are both recent and timely. Nevertheless, when interpreting the present findings one should consider possible limitations. The present study only concludes the conclusion part of the included studies. The study did not critic or discuss the regimens independently. A number of studies might be possible by adding different regimens or interventions for pre or post breast cancer surgery patients. Moreover, as a result of the low number of studies available, no standard definition for BCRL was used and the measurement techniques differed among the studies. However, while this must certainly be considered as a limitation of the present review, it should be noted that there is a lack of definition for BCRL even in medical care, making the investigation of treatment methods challenging. Based on the present findings, it can be concluded from the current literature that physical exercise is not contraindicated for women with BCRL. When completed according to the ACSM guidelines for cancer survivors3there is no restriction recommended regarding BCRL and

any form of exercise. As such, our findings are in contrast to the early recommendations by health care professionals to avoid vigorous or excessive upper-body exercise, including activities of daily living [23]. Moreover, future studies may also focus on the possible preventive aspects of physical exercise for the development of BCRL in breast cancer patients.

References:

1. http://www.wcrf.org/int/cance r-facts -figur es/data-speci fic-cance rs/breas t-cance r-stati stics
2. Coleman MP, Quaresma M, Berrino F, Lutz J, De Angelis R, Capocaccia R, Baili P, Rachet B, Gatta G, Hakulinen T, Micheli A, Sant M, Weir HK, Elwood JM, Tsukuma H, Koifman S, Silva GA, Francisci S, Santaquilani M, Verdecchia A, Storm HH, Young JL (2008) Fast track—articles: cancer survival in five continents: a worldwide population-based study (CONCORD). Lancet Oncol 9:730–756
3. Hayes S, Sipio TD, Rye S, Lopez JA, Saunders C et al (2011) Prevalence and prognostic significance of secondary lymphedema following breast cancer. Lymphat Res Biol 9(3):135–141
4. Mortimer P (2013) Arm lymphoedema after breast cancer. Lancet Oncol 14:423–442
5. DiSipio T, Rye S, Newman B, Hayes S (2013) Incidence of unilateral arm lymphoedema after breast cancer: a systematic review and meta-analysis. Lancet Oncol 14:500–515
6. Liebl ME, Preiß S, Pögel S et al (2014) Elastic tape as a therapeutic intervention in the maintenance phase of complex decongestive therapy (CDT) in lymphedema. Phys Med Rehabil Kuror 24:34–41
7. Runowicz CD, Leach CR, Henry NL, Henry KS, Mackey HT, Cowens-Alvarado RL, Cannady RS, Pratt-Chapman ML, Edge SB, Jacobs LA, Hurria A, Marks LB, LaMonte SJ, Warner E, Lyman GH, Ganz PA (2016) American Cancer Society/American Society of Clinical Oncology Breast Cancer Survivorship Care Guideline. J Clin Oncol 34(6):611–635
8. Keilani M, Hasenoehrl T, Neubauer M, Crevenna R (2016) Resistance exercise and secondary lymphedema in breast cancer survivors a systematic review. Support Care Cancer 24(4):1907–1916
9. Nelson NL (2016) Breast cancer-related lymphedema and resistance exercise: a systematic review. J Strength Cond Res 29:2656–2665
10. Paramanandam VS, Roberts D (2014) Weight training is not harmful for women with breast cancer-related lymphoedema: a systematic review. J Physiother 60(3):136–143
11. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gotzsche PC, Ioannidis JPA et al (2009) The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. PLoS Med 6(7):1000100
12. Box RC, Reul-Hirche HM, Bullock-Saxton JE, Furnival CM. Physiotherapy after breast cancer surgery: results of a randomised controlled study to minimise lymphoedema. Breast cancer research and treatment. 2002 Sep 1;75(1):51-64.
13. Devoogdt N, Geraerts I, Van Kampen M, De Vrieze T, Vos L, Neven P, Vergote I, Christiaens MR, Thomis S, De Groef A. Manual lymph drainage may not have a preventive effect on the development of breast cancer-related lymphoedema in the long term: a randomised trial. Journal of physiotherapy. 2018 Sep 18.
14. Baumann FT, Reike A, Hallek M, Wiskemann J, Reimer V. Does Exercise Have a Preventive Effect on Secondary Lymphedema in Breast Cancer Patients Following Local Treatment-A Systematic Review. Breast Care. 2018.
15. Rafn BS, Hung S, Hoens AM, McNeely ML, Singh CA, Kwan W, Dingee C, McKevitt EC, Kuusk U, Pao J, Van Laeken N. Prospective surveillance and targeted physiotherapy for arm morbidity after breast

cancer surgery: a pilot randomized controlled trial. Clinical rehabilitation. 2018 Jun;32(6):811-26.

16. Cobbe S, Nugent K, Real S. Pilot Study: The Effectiveness of Complex Decongestive Therapy for Lymphedema in Palliative Care Patients with Advanced Cancer. Journal of palliative medicine. 2018 Apr 1;21(4):473-8.

17. Lacomba MT, Sánchez MJ, Goñi ÁZ, Merino DP, del Moral OM, Téllez EC, Mogollón EM. Effectiveness of early physiotherapy to prevent lymphoedema after surgery for breast cancer: randomised, single blinded, clinical trial. Bmj. 2010 Jan 13;340:b5396.

18. McKenzie DC, Kalda AL. Effect of upper extremity exercise on secondary lymphedema in breast cancer patients: a pilot study. Journal of clinical oncology. 2003 Feb 1;21(3):463-6.

19. Baumann FT, Reike A, Reimer V, Schumann M, Hallek M, Taaffe DR, Newton RU, Galvao DA. Effects of physical exercise on breast cancer-related secondary lymphedema: a systematic review. Breast cancer research and treatment. 2018 Feb 22:1-3.

20. Harris SR, Niesen-Vertommen SL (2000) Challenging the myth of exercise-induced lymphedema following breast cancer: a series of case reports. J Surg Oncol 74:95-99