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Occupational Therapy Lymphedema Management and Its Relationship to Quality of Life

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Focused Question

What evidence is there for the effectiveness of exercise, compression and massage interventions in relationship to lymphedema management in order to establish, modify, and maintain activities of daily living (ADLs) and instrumental activities of daily living (IADLs) for middle aged adults with status post-breast cancer lymphedema and the effects the diagnosis has on their quality of life?

Clinical Scenario

In the United States, one in five women who survive breast cancer will develop lymphedema (DiSipio, Rye, Newman, & Hayes, 2013). Lymphedema is the chronic, progressive swelling of tissue due to inadequate lymphatic function. Over time, protein-rich fluid accumulates in the tissue, causing skin and tissue to enlarge (Maclellan & Greene, 2014). This condition often leads to impaired performance of activities of daily living (ADL) and instrumental activities of daily living (IADL) due to this abnormal swelling. Activities of daily living are defined as "activities oriented toward taking care of one's own body" (Rogers & Holm, 1994, p. S19). Instrumental activities of daily living are defined as "activities that support daily life within the home and community that often require more complex interactions than those used in ADL's" (AOTA, 2014, p. S19).

Lymphedema has a high prevalence rate in the United States, but its epidemiology is underwhelmingly researched. The two major types of lymphedema are primary and secondary. Primary lymphedema affects one in one hundred thousand people in the United States. Primary lymphedema is categorized by congenital defects in lymphatic system formation that most often occurs because of genetic mutation. This malformation results in either hyperplasia, hypoplasia,

or aplasia of the lymphatic vessels which causes irregular draining of lymph from the vessels. Secondary lymphedema is caused by damage or dysfunction to the lymphatic system that is not related to congenital factors (Sleigh & Manna [Updated 2019 Dec 5]). This damage or dysfunction could be attributed to several factors such as a parasitic infestation of lymph nodes, cancer treatments, surgeries that impact the lymph nodes, recurrent tumors that metastasize in the lymph nodes, or traumatized lymphatic vessels. Secondary lymphedema is responsible for one in one thousand cases, making it much more commonly occurring than primary lymphedema. This presents a gap in the research where the dysfunction of the lymphatic system is not well studied but the rates of lymphedema and lymphatic disorders are relatively high (Sleigh & Manna [Updated 2019 Dec 5]).

Breast-cancer related lymphedema differs from primary and secondary lymphedema as a blockage is present in the one-way lymphatic transport system from physical trauma to the affected area caused by surgery or radiation (McClure, McClure, Day, & Brufsky, 2010). Symptom progression over time without continual management highlights the need for high-quality long-term therapy programs as there is a high degree of physical morbidity including swelling and loss of limb flexibility.

By utilizing occupational therapy services in this area, clients are able to be educated on their diagnosis, strategies to manage symptoms, and to increase overall participation in ADL's and IADL's, which in turn increases their quality of life. The purpose of this review is to assist occupational therapy practitioners in making evidence-based decisions on the use of interventions for adults with lymphedema, recovering from cancer treatment and the effects the diagnosis had on their quality of life.

Synthesized Summary of Key Findings

The total number of articles reviewed initially was 30 before being narrowed down to four. The articles demonstrating the best available evidence were three randomized control trials (RCT) and one quasi-experimental clinical trial. The three RCTs all used the design of a randomized control trial with a control and treatment group (Buchan, Janda, Box, Schmitz, & Hayes, 2016; McClure et al., 2010; Thakur, Bhat, & Kaur, 2016). Sampling procedures throughout all four articles were similar as female patients meeting the criteria within each study volunteered, provided consent to participate, and were recruited through flyers placed within hospitals, outpatient clinics, or private practices offering lymphedema treatment. Also, within two of the articles, criteria included a clinical diagnosis of unilateral lymphedema in the upper limb as a result of breast cancer and a third study involved patients who had planned to undergo a mastectomy (Buchan et al., 2016; McClure et al., 2010; Thakur et al., 2016). The age of female participants was consistent within each study and included women 18 years old to the age of 80 years. However, the number of participants within each treatment and control group varied greatly, with sample sizes below 30 participants within each group.

Among the treatment provided in each study, bioimpedance, or the measure of arm swelling and girth of the infected upper limb in comparison to the unaffected limb was used before and after the intervention (Buchan et al., 2016; McClure et al., 2010; Thakur et al., 2016). Also, in two of the three RCTs, a Quality of Life (QoL) questionnaire was given before and after treatment, and the interventions were based on a previous program already put in place (Buchan et al., 2016; Thakur et al., 2016). Treatment procedures varied significantly between studies based on the focus of the activities.

Wellness Programming: Aerobic Exercise and Resistance Training

Within the first RCT by McClure et al. (2010), participants attended ten biweekly sessions lasting an hour for five weeks that involved watching a relaxation video program, "From Lymphedema Onto Wellness" that incorporated relaxation techniques and resistive arm flexibility activities along with educational material, and strategies on ways to cope" (McClure et al., 2010, p.3). During post-intervention, change in weight, swelling, mood (Beck Depression Inventory-II), arm range of motion using a goniometer, QoL, and adherence to the program were measured (McClure et al., 2010). Intervention varied considerably within the next RCT by Buchan et al. (2016), measuring differences in aerobic resistance exercises that took place over twelve weeks. The resistance training group completed a full-strength program, for example, squat, pull up, and/or shoulder press. New exercises were introduced each week while the aerobic group engaged in activities of their preference, such as walking/jogging and cycling while under constant supervision and maintaining their routine lymphedema management (Buchan et al., 2016).

Compression and Decongestive Therapy.

The third RCT by Thakur et al. (2016), used the Self-Management of Lymphedema Program (SMLP) to provide education on awareness of Lymphedema risk factors, training, step by step photos, and a time schedule to complete the program. This study focused on the early intervention and prevention of lymphedema by providing post-operative patients with massage and stretching techniques to practice in early recovery (Thakur et al. 2016). The quasi-experimental study by Oshnari, Hosseini, Haghighat, and Zadeh (2016) incorporated treatment options related to the other studies but used different bandaging compression techniques and asked clients to perform self-massages to drain their lymph out of the affected tissue manually.

Strengths

All the articles demonstrated that incorporating educational strategies in combination with treatment proved to be more effective (Buchan et al., 2016; McClure et al., 2010; Oshnari et al., 2016; Thakur et al., 2016). The third RCT by Thakur et al. (2016) and the quasi-experimental study by Oshnari et al. (2016) both exhibited statistically significant results in volumetric reduction ($p < 0.0001$) by instilling the strategies of self-massage, compression sleeves, bandages, exercise, and manual lymphatic drainage that aided in pain reduction and increased QoL (Oshnari et al., 2016; Thakur et al., 2016). While the last two RCTs by Buchan et al. (2016) and Thakur et al. (2016) lacked statistically significant evidence, each demonstrated strengths for future implementation of exercise as part of a lymphedema program based on the improvements in physical and emotional health seen throughout the articles (Buchan et al., 2016; Thakur et al., 2016). The clinical significance shows promise for any or all of these programs to be implemented in a clinical setting to treat clients with lymphedema with a history of breast cancer.

Weaknesses

Each article had a limited sample size and was not accurately representative of the general population. The population being focused on is predominantly women due to our inclusion criteria of a breast cancer diagnosis. The omittance of males in the population samples might indicate a gender bias in the research. The narrow focus of the inclusion criteria of the study also omits a large portion of the population suffering from lymphedema as breast cancer is not the only cause. The lack of statistical significance is another identified weakness due to the lack of support through numerical data to demonstrate the effectiveness of treatments and to include findings in clinical practice.

Overall, the results were similar in each study. Statistically significant evidence was incongruent between each intervention and sample sizes limited generalizability as they did not represent the general population (Buchan et al., 2016; McClure et al., 2010; Oshnari et al., 2016; Thakur et al., 2016). However, improvements in physical and emotional symptoms among the treatment groups enhanced QoL and decreased physical symptoms (Buchan et al., 2016; Thakur et al., 2016). The evidence-based programs used within some of the studies provided flexibility as they could be implemented within the clinic or home setting. By supporting and promoting healthy activity participation, an effective increase in self-management and awareness of symptoms was discovered.

Clinical Practice Applicability

Review of Evidence

The evidence found in our four articles reviewed demonstrated that the researched treatments were successful in reducing symptoms of lymphedema in both physical and emotional aspects that impact QoL. The evidence has been sufficient in finding treatments to reduce lymphedema symptoms. Physical, aerobic, strengthening exercises and compression in the form of various bandaging techniques was found to reduce lymphedema symptoms as reviewed in our articles. Each article differed based on the involvement of the researcher or instructor in the program, how often they met, and the duration the programs studied. Some programs combined exercises and compression, while others looked at one or the other separately. An indicated gap in the research lies in which professions can implement and be reimbursed for this type of treatment. Biases that were presented in each of the four articles were small sample sizes comprised exclusively of women, leading to a possible gender bias of the data.

OT Perspective

Cultural considerations were not found or discussed among any of the articles and each article lacked participant demographics that would have taken culture into account. Based on one's cultural background, participation could be limited in approaches to rehabilitation mentioned in the studies due to value and belief systems. Occupational therapy (OT) is a diverse profession that is educated on all aspects of the person, including their cultural context. This perspective from an OT would make them a culturally competent practitioner to work with lymphedema patients in future studies. Occupational therapy is a profession with widespread knowledge across multiple settings to improve the client's quality of life through the therapeutic use of daily activities to enhance participation in occupations involving ADLs and IADLs (AOTA, 2014). Activities of daily living are defined as "activities oriented toward taking care of one's own body" (Rogers & Holm, 1994, p. 3). Instrumental activities of daily living are defined as "activities that support daily life within the home and community that often require more complex interactions than those used in ADL's" (AOTA, 2014, S43). The treatments of lymphedema consist of education programs, exercise regimens, and the use of equipment such as compression bandages to manage the symptoms of lymphedema. Symptoms such as swelling, pain, and reduced range of motion in the affected limb(s) are among the most common and are within OT's scope of practice.

Need for Lymphedema Treatment

OTs possess the education, professional skills, and ability to work across a variety of settings such as mental health, acute and community health, and oncology to treat the whole person in a holistic manner (Occupational Therapy Australia, 2015; Dimick et al., 2009).

Occupational therapy specializes in tailoring treatment options to the client's needs and knows how to form client-centered treatment programs to use in therapy. In working with these clients, it would be advisable to first administer a QoL assessment to identify if a client qualifies for OT services and implement a program to address their lymphedema as needed. The results of the QoL assessment would determine which aspects of life the client is unsatisfied with, assisting the OT in establishing client-centered goals. Next, the OT would work with the client to decide which approaches the client would benefit from most, such as education, physical exercises, or compression therapy. The need for professional lymphedema treatment is essential to aid in reducing complications from breast cancer surgeries. This need only continues to grow as life expectancy grows longer and breast cancer is more frequently detected and treated before it becomes fatal, thus increasing the amount of breast cancer surgeries that occur. Other health professionals that could be involved on the treatment team are physical therapists, massage therapists, or nursing staff to provide the treatments recommended for lymphedema. A physical therapist may provide support in aerobic or resistance programs or stretching techniques to improve range of motion. A massage therapist may also offer services to perform decongestive therapy to assist in draining the lymph out of the tissue. Lastly, nursing staff could aid in compression or bandaging techniques. Although none of these professions were utilized in the studies, each could play a pivotal role working alongside OTs to treat the client populations within this diagnosis.

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