Pain rehabilitation treatment for women with breast cancer

Tratamento de reabilitação para dor em mulheres com câncer de mama

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DOI 10.5935/2595-0118.20190049

ABSTRACT

BACKGROUND AND OBJECTIVES: Breast cancer is a public health problem due to its high rates of incidence and mortality, and the presence of pain in the arm and breast is a very frequent symptom in these women. The objective of this study was to organize scientific evidence on rehabilitation treatments for women after breast cancer surgery.

CONTENTS: The search was performed based on the Medline, LILACS, and Scielo database on articles published in the last 10 years, from January 2008 to January 2018. The survey was carried out with the following keywords: "Breast Cancer" and "Upper Limb" and "Pain" and "Rehabilitation". Randomized clinical trials, pilot study, and quasi-experimental study were included. The search totaled 92 articles, of which only seven articles were selected. The visual analog scale was used in most articles.

CONCLUSION: Physiotherapy and physical exercise can benefit women with breast cancer, reducing pain, and increasing the upper limb's functionality, as well as minimize the lymphedema.

Keywords: Breast cancer, Pain, Rehabilitation, Upper limb.

RESUMO

JUSTIFICATIVA E OBJETIVOS: O câncer de mama é um problema de saúde pública devido às altas taxas de incidência e mortalidade, e a presença de dor no braço e na mama é um sintoma de maior frequência nessas mulheres. O objetivo deste estudo foi organizar as evidências científicas sobre os tratamentos de reabilitação para dor utilizados com mulheres após a cirurgia do câncer de mama.

CONTEÚDO: A busca foi realizada a partir da consulta às bases de dados Pubmed, LILACS e Scielo, dos artigos publicados nos últimos 10 anos, de janeiro de 2008 a janeiro de 2018. O levantamento foi realizado com os seguintes descritores: "Breast Cancer" *AND* "Upper Limb" *AND* "Pain" *AND* "Rehabilitation". Foram incluídos ensaios clínicos randomizados, estudos piloto e estudos quase-experimentais. A busca totalizou 92 artigos e destes foram selecionados apenas sete. A escala analógica visual foi utilizada na maioria dos artigos.

CONCLUSÃO: A fisioterapia e o exercício físico podem beneficiar mulheres com câncer de mama, reduzindo a dor e aumentando a funcionalidade de membro superior, além de minimizar o linfedema.

Descritores: Câncer de mama, Dor, Extremidade superior, Reabilitação.

INTRODUCTION

Breast cancer (BC) is a public health problem due to the high incidence and mortality rates. Among the types of cancer, breast cancer has the highest incidence among women[1,2]. In the world, the growth rate has reached 20% in the last decade, and the impact of cancer will correspond to 80% in the population between developed and developing countries[1].

BC surgery, axillary lymphadenectomy, and manipulation of the pectoral muscles bring a risk of tissue injury and complications in up to 70% of cases. Complications due to axillary alterations include chronic pain, shoulder movement limitations, and muscle atrophy[3].

Thus, the presence of moderate or severe pain is more frequent in patients undergoing axillary dissection compared to those who underwent sentinel node biopsy[4]. The occurrence of pain in the arm that is homolateral to the surgery is more related to the extension of the axillary surgical procedure and injuries to some structures such as the intercostobrachial nerve and the serratus anterior[4]. Arm and breast pain is the most frequent symptom in these women, corresponding to 51.6%[4-6]. In patients under 40 years old, the presence of lymphedema significantly increases the risk of post-mastectomy pain syndrome[7], and the literature converges on sedentary behavior as a predictor of pain[8-10]. Thus, rehabilitation may be an acceptable non-pharmacological alternative to minimize pain in women with BC to promote an improvement in physical recovery.

Thus, to minimize the pain caused by the treatment of BC, rehabilitation becomes essential and an integral part in the adjunctive treatment of these women. Given the above, this study aimed to organize the scientific evidence on pain rehabilitation treatments used with women after BC surgery.

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Submitted on July 25, 2018.
Accepted for publication on January 07, 2019.
Conflict of interests: none – Sponsoring sources: none.

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CONTENTS

The systematic review was performed based on a retrospective consultation of the Scielo, Pubmed, and LILACS databases, in January 2018, and the search strategy was formulated by crossing descriptors (DeCS and MeSH). Only studies conducted with women diagnosed with BC and treated with pain rehabilitation techniques were included. In addition, the studies should be in Portuguese, English, or Spanish, published in the last 10 years (January 2008 to January 2018). Articles that did not present any intervention to treat pain were excluded.

In the Scielo, LILACS (DeCS) and Medline databases, the following crosses were used: "Breast Cancer" AND "Upper Limb" AND "Pain and Rehabilitation". In the initial phase, titles and abstracts were independently identified and assessed by two reviewers to select those that met the eligibility criteria. Articles that did not meet the criteria described were excluded by title analysis, followed by exclusion by the abstract. Finally, potentially relevant studies were retained for further analysis of the full text. The prominent information was presented in a descriptive table, considering the following variables: authors, sample, assessed outcomes, methodological design, intervention, and effects found. In the initial search in the databases, 92 articles were found. After a first selection by title, 75 articles were excluded, staying 17 for analysis of the abstracts. Of these, eight articles were selected that met the inclusion criteria established.

Figure 1 shows the selection process of the included articles, and table 1 shows the list of selected studies that used rehabilitation to treat pain in women with BC.

Analyzing the results obtained by the search strategy, there was a higher concentration of studies in 2016, with a single publication in 2008. It is also evident that the study participants were volunteers of different age groups, but the average age of the analyzed samples corresponded to the middle-age population. Of the eight articles that were used in this study, four used

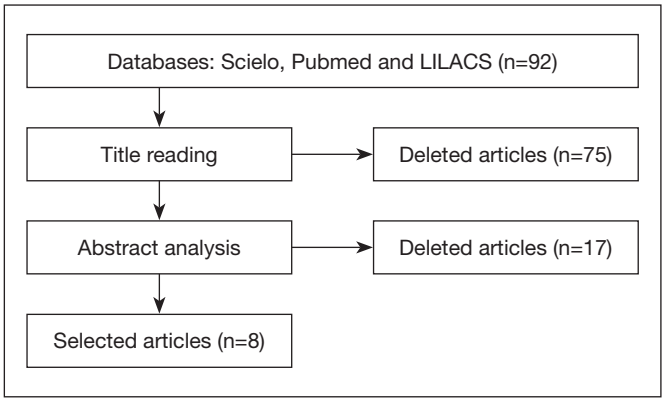

Figure 1. Data Search

Table 1. Description of the selected studies that used rehabilitation to treat pain in women with breast cancer

Authors	Sample	Assessed outcomes	Methodological design	Intervention	Results
De Groef et al.[12]	147 women in CG 53±9 years old and IG 54±7 years old.	A question regarding the prevalence point of pain, shoulder and neck region, arm, armpit, trunk side, and breast region (yes/no). VAS and McGill pain. DASH upper limb (UL) functionality. QoL SF-36.	Randomized clinical trial divided into 2 groups. CG (n=74). IG (n=69). All patients were assessed before surgery and at 2, 4, 9, and 12 months after surgery.	All participants (n=147) four months before randomization received physical therapy. CG received physical therapy and placebo treatment IG received physical therapy and myofascial therapy.	There were no significant differences in pain prevalence rate and intensity between IG and CG. No significant differences in shoulder function and QoL in both short- and long-term groups.
Ibrahim et al.[8]	59 women aged 39.2 ±5.0 years old.	General information ROM was used the goniometer for flexion, abduction, adduction, ER and IR movements. Presence of pain (yes/no) during isolated movements. Wrist strength was measured using a hand dynamometer.	Prospective randomized study. 6 assessments (T1) after surgery and before radiotherapy, (T2) after radiotherapy completion, (T3) 3 months, (T4) 6 months, (T5) 12 months and (T6) 18 months after radiotherapy.	CG (n=30) received standard care (general information and encouragement of a healthy lifestyle with physical exercise). IG (n=29) 12-week exercise program that began in the first three to four weeks after radiotherapy.	T1-T2 postoperative pain levels were lower in IG for ER, flexion, and abduction movements. T3-T4 IG improved ROM in ER and abduction movements; the same movements were decreased in CG. Pain levels were decreased in IG for flexion, abduction, and ER movements and increased incidence of pain in the same movements in CG. T5-T6 12 months after radiotherapy IG did not report pain in all movements except for ER. Recurrence of IG pain at 18 months after radiotherapy was present in all shoulder movements. In contrast, CG at 12 months after radiation reported pain in all movements and persisted at 18 months after radiotherapy in flexion and ER movements.

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Table 1. Description of the selected studies that used rehabilitation to treat pain in women with breast cancer – continuation

Authors	Sample	Assessed outcomes	Methodological design	Intervention	Results
House et al.[13]	6 women aged 57±8 years old.	Pain assessed by NRS. UL, FMA, and CAH-AI-9 function. JHFT hand function. BDI Dynamometer hand strength. Wrist weights strength.	Pilot study	Twice a week training for eight weeks with robotic rehabilitation, each session lasted 20 to 50 minutes.	The pain was measured at the beginning and end of each session, with a 20% decrease in reported severity. UL movements improved (p=0.02). The BDI scale results were statistically significant after training (p=0.01).
Cho et al.[14]	48 women aged 50±7 years old in the physical therapy group (PT) and 46±6 years old in the physical therapy combined with manual lymphatic drainage (PTMLD) group.	Assessment of perimetry lymphedema. Manual dynamometer force. Digital inclinometer shoulder ROM. QL EORT QLQ-C30. DASH functionality. Visible and palpable presence of the axillary cord.	Randomized	Two groups, one PT (n=24) and another PTMLD group (n=24). Three times a week for four weeks.	In both groups, there was a significant improvement in physical, emotional, and social role, fatigue, and pain (p<0.05). Arm volume increased significantly over time in the PT group (p<0.05). The PTMLD group significantly decreased the NRS score compared to the PT group (p<0.05). The same occurred based on the EORT QLQ-C30. The pain was also significantly decreased in the PTMLD group compared to the PT group (p<0.05). Significant decrease in arm volume was observed in the PTMLD group (p<0.05).
Zengin Alpozgen et al.[9]	57 women aged 46.22±11.19 years old in the Pilates group (PE), 51.94±8.05 in the exercise group (CE) and 51.53±13.81 in the home-exercise group (HE).	Pain assessed by VAS. Digital goniometer shoulder ROM. Force digital dynamometer. UL DASH and Constant-Murley Functionality.	Randomized	Three groups: PE (n=18), Stretching, strengthening, and shoulder range of motion (CE) exercise group (n=18) and the home exercise (HE) group (n=19). PE and EC groups were supervised by a physical therapist three times a week for eight weeks.	Pain on movement decreased significantly in all groups (p<0.001). Resting pain also improved significantly in all PE (p=0.004), CE (p=0.002), and HE (p=0.005) groups. Muscle strength increased in the PE and CE groups. In ROM, the CE group had an improvement in all shoulder movements (p<0.001), in the PE group only in shoulder flexion (p=0.001) and shoulder abduction movements (p=0.002) and in the HE group only. In shoulder abduction movement (p=0.002). There was a significant improvement in UL functionality for PE and CE groups (p<0.001).
Angooti Oshnari et al.[15]	36 women aged 53±10.28 years old	Arm volume was calculated as arm percentage volume reduction (PVR) VAS pain	Quasi-experimental study.	1st phase - six times a week for two weeks, it was performed by manual lymphatic drainage (MLD) physical therapist. 2nd phase - maintenance, for two weeks included daily lymphatic drainage performed by the patient (SLD) with monitoring of the physical therapist twice a week	Lymphatic drainage was effective in reducing lymphatic edema and pain in women after breast cancer surgery.
Rett et al.[16]	39 women aged 50.6±10.8 years old	ROM by Goniometry. VAS - intensity of pain. McGill (Br-MPQ) pain characterization.	Descriptive and longitudinal analytical study.	There were 20 physical therapy sessions, 3 times a week, lasting 60 minutes. The exercises were cervical stretching and active-free exercises of flexion, extension, abduction, adduction, IR, and ER.	VAS pain decreased from 3.8±1.7 to 3.0±1.9 when compared from the 1st session to the 10th session. From the 1st session to the 20th session, there was no decrease in pain (p=0.09), and from the 10th session to the 20th session (p=0.79). In the Br-MPQ scale from the 1st session (p=0.0021) and the 10th session (p=0.0159) and from the 1st (p=0.0001) session to the 20th (p=0.0003). ROM improved in all movements, and no association was found between ROM and pain intensity.

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Table 1. Description of the selected studies that used rehabilitation to treat pain in women with breast cancer – continuation

Authors	Sample	Assessed outcomes	Methodological design	Intervention	Results
Keays et al.[10]	4 women	ROM by Goniometry. UL functionality self-reported 12-item questionnaire. Pain - BPI Humor - (POMS) Lymphedema - Perimetry	Not shown	Pilates specific exercises for 12 weeks, three times a week.	All women improved shoulder flexion and ER, and 2 women improved abduction and RI. 3 women had zero pain score. 3 women showed improved mood. In the analysis of UL functionality, 2 women reported improvement, and only 1 woman kept UL functionality stable.

VAS = visual analog scale; QoL = quality of life; ER = external rotation; IR = internal rotation; Br-MPQ = McGill Pain Questionaire; BPI = Brief Pain Inventory Short; DASH = Disabilities of the Arm, Shoulder and Hand; ROM = range of motion; NRS = Numeric Rating Scale; FMA = Fugl-Meyer Assessment; CAHAI-9 = Chedoke arm and hand activity inventory; JHFT = Jebsen-Taylor Hand Function Test; UL = upper limb; BDI = Beck Depression Inventory; EORTC QLQ-C30; European Organization for Research and Treatment of Cancer Quality of Life Questionnaire C30; POMS = Profile of Mood States.

VAS to assess pain, two articles were assessed by the McGill pain scale, and one article was assessed by the Brief Pain Inventory Short (BPI). VAS is a one-dimensional measure for pain intensity assessment. Composed of a 10 BC line, with anchors at both ends, on one end of the line is marked "no pain" and the other "worst pain imaginable." The magnitude of pain is indicated by marking the line, and a ruler is used to quantify the measurement on a scale from zero to 100mm[11]. It is recognized worldwide and widely used in studies with BC patients.

DISCUSSION

BC is the most common among women, causing upper limb disability homolateral to surgery and chronic pain, being observed in the listed studies. Decreased upper limb functionality homolaterally to surgery may interfere with the quality of life of these women, and the prevalence of pain is high as a result of treatment. This study revealed effective outcomes regarding pain relief rehabilitation in women with BC.

The interaction of psychological and social factors, surgery, upper limb muscle weakness homolateral to the surgery, decreased range of motion (ROM) and pain are determinant to cause reduced upper limb functionality. Impaired functionality negatively affects the QoL of these women. Studies by Ibrahim et al.[8], Zengin Alpozgen et al.[9] and Keays et al.[10] reported that physical exercise was able to promote the improvement of clinical symptoms related to pain. In addition, physical exercise improves joint mobility, upper limb functionality, and increased muscle strength[8-10]. The duration of pain treatment in these women can be from 4 to 12 weeks. However, some authors suggest the need to treat this symptom for a longer period of time[8-10].

In the specific exercise program, Ibrahim et al.[8] were able to improve shoulder ROM three months after radiation compared to the control group, and it was found that increased ROM is associated with a reduction in the incidence of pain. Participants had pain in all shoulder movements at 12 months after radiation. However, there was a decrease in pain in the intervention group compared to the control group. On the other hand, shoulder movement pain remained in both groups at 18 months after radiation.

The Pilates method was used in rehabilitation in the studies by Zengin Alpozgen et al.[9] and Keays et al.[10]. The method has been shown to be adequate and capable of eliminating adverse effects of BC treatment, relieving or reversing the reduction of shoulder mobility, improving ROM, decreasing pain at movement and at rest, and consequently promoting the improvement of upper limb functionality.

Robotic rehabilitation for eight weeks was used by House et al.[13]. The authors observed improvement in activities of daily living due to increased muscle strength and ROM. Also, the study's most notable finding was a significant improvement in depression. This finding facilitates the hypothesis that the ability to interact with virtual media may be beneficial to the mental health of this population.

The upper trapezius muscle region has been described as one of the most sensitive areas in patients with BC. Pain caused by myofascial dysfunction may, in fact, manifest as increased pressure and hypersensitivity in the upper limb region[12]. Myofascial therapy, however, had no beneficial effects on the prevalence, quality, and intensity of postoperative pain after BC surgery[12].

It is noteworthy that lymphedema causes pressure on the vessels and peripheral nerves of the skin and muscles of the upper limb and trunk, causing pain. In this context, in studies by Cho et al.[14] and Angooti Oshnari et al.[15], lymphatic drainage reduced muscle pain and lymphedema, which is a painful condition that limits upper limb functioning and leads to low QoL[14,15].

Kinesiotherapy improves the ROM of these women and reduces pain when performed at the beginning of treatment, even without showing a direct relationship between increased ROM and decreased pain[16]. Knowing the interference in daily life with the physical and social tasks that the pain can lead, it is extremely relevant and valid to think about this strategy within rehabilitation.

Rehabilitation has been shown to be effective in improving pain in patients with BC. From this review, it was noted that several features such as manual therapy, stretching and muscle strengthening exercise, upper limb mobility, lymphatic drainage, and Pilates exercises bring notable benefits for women with BC[8-16].

CONCLUSION

Physical therapy and physical exercise can benefit patients with BC by reducing pain and increasing upper limb functionality and improving lymphedema.

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