The Breast 35 (2017) 8–13

Contents lists available at ScienceDirect

The Breast

journal homepage: www.elsevier.com/brst

Original article

Impact of physical activity in group versus individual physical activity on fatigue in patients with breast cancer: A pilot study

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ARTICLE INFO

Article history:
Received 18 January 2017
Received in revised form
10 May 2017
Accepted 4 June 2017

Keywords:
Breast cancer survivor
Physical activity
Exercise
Hormonal therapy

ABSTRACT

Background: Physical activity improves the quality of life of cancer survivors, but whether there is a difference between individual vs. group physical activity is unknown.
Objectives: To compare fatigue at 12 weeks in breast cancer survivors after participation in a program of group vs. individual video-assisted physical activity.
Methods: This was a randomized phase II pilot study carried out in breast cancer survivors at a tertiary breast cancer center. Eligible patients were randomized to individual or group 12-week physical activity program. The primary outcome was fatigue (FACT-F). Aerobic capacity (6-min walk test), muscular strength, and quality-of-life (FACT-G and FACT-B) were assessed. Because of poor accrual, 200 consecutive breast cancer patients were surveyed about their physical activity habits to assess reasons for low recruitment.
Results: For all participants (n = 26; n = 12 for group vs. n = 14 for individual), there were some improvement in FACT-F, FACT-G, FACT-B, physical activity level, aerobic capacity, and shoulder strength. Among the 200 patients surveyed, 58% were interested to increase their physical activity level, 15% declared that they were already exercising enough, 9% declared being unable to, 3% declared having no time, and 2% declared having no interest, and other reasons (13%). Among the 200 patients surveyed, 25% preferred in group, 57% preferred alone, and 18% had no preference.
Conclusion: Low recruitment precluded conclusions about the efficacy of physical activity practiced in group vs. individually, but both groups derived a benefit. Low willingness to change exercising habits could be the biggest barrier to physical activity in breast cancer survivors.

Introduction

Breast cancer is the most common cancer diagnosed in Canadian women [1]. Survival has been continuously improving in the past 15 years due to prevention and better treatments [1], but the treatments affect the patients' quality of life [2,3]. Breast cancer survivors often complain of fatigue, especially those under chemotherapy and hormonal therapy [2,4–6]. Fatigue may be felt for as long as three years after the end of chemotherapy [7] or even longer [8]. Aromatase inhibitors are used to decrease the risk of breast cancer recurrence, but they are associated with significant side effects such as arthralgia and menopausal symptoms [9–11], which could be associated with a poor adherence to treatment and motivation to exercise.

In recent years, data on physical activity in patients with breast cancer have consistently shown that physical activity is beneficial

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http://dx.doi.org/10.1016/j.breast.2017.06.001
0960-9776/

in these patients. Indeed, a systematic review has shown that physical activity could significantly decrease fatigue in breast cancer survivors [12]. A Cochrane review has also shown that physical activity improved the quality of life [13] including muscle pain [14,15] and menopausal symptoms [16]. The American College of Sport Medicine stated that physical activity during cancer treatments was safe and efficient in reducing treatment symptoms, thereby improving quality of life [17]. Nevertheless, only about 44–49% of physicians suggest physical activity to their patients with breast cancer [18,19]. Traditionally, the physical activity programs tested in women receiving chemotherapy were using group-based strategies, but personal training approaches might be more convenient for some individuals [20,21].

Therefore, the aim of this pilot study was to compare the fatigue level in breast cancer survivors under aromatase inhibitor treatment after a 12-week program of group physical activity vs. individual video-assisted physical activity. The working hypothesis was that women practicing physical activity individually received as much benefits from physical activity as women who practiced physical activity in groups. Secondary objectives were: 1) to compare physical fitness in these women; 2) to compare quality of life in these women; 3) to explore the factors predicting compliance with a physical activity program; and 4) to explore compliance to hormonal therapy in women participating in a physical activity program. Given low recruitment, the study was modified to add a survey about physical activity level and interest in physical activity in a population of breast cancer survivors. In addition, because of low accrual, secondary objectives 3 and 4 could not be carried out.

Methods

Study population

This was a prospective randomized phase II pilot study carried out in women who had been diagnosed and treated at the Deschênes-Fabia Center for Breast Diseases (CHU de Québec - Université Laval, Quebec City, Canada), which is a tertiary breast cancer care center treating >1200 new breast cancers yearly. Women were recruited between August 2013 and January 2014. Inclusion criteria were: 1) women diagnosed with stage I, II, or III breast cancer; 2) was receiving aromatase inhibitor therapy; and 3) radiation therapy has been completed for at least 1 month. Exclusion criteria were: 1) metastatic breast cancer; or 2) any contraindication to physical activity (uncontrolled heart disease, lung condition, poor cardiopulmonary function, psychological disorders, severe disability, etc.).

Eligible women were offered to participate in the trial by their attending physician. Patient lists were screened each morning and women potentially eligible were flagged (a same woman could have been flagged more than one time). A study form was placed in the chart for the physician to discuss the study with the patient and to refer the patient to the trial. There were then four scenarios: 1) the physician ruled that the patient was non-eligible; 2) the physician proposed the study but the patient refused; 3) the physician proposed the study, the patient was interested, but then decided not to participate; and 4) the physician proposed the study and the patient participated. This study was approved by the research ethics board of the CHU de Québec - Université Laval. A written informed consent was obtained from each participant for the physical activity program study. For the survey among the 200 women, the ethics committee waived the need for individual consent because the survey was anonymous; filling the survey was considered as a *de facto* consent.

Randomization

Patients were randomized using a computer-generated random table. Physical activity allocation was carried out using sequential sealed envelopes by the study coordinator.

Intervention

Patients randomized to individual physical activity exercised with the help of a video respecting the general principles of training [22]: 1) specificity (training adaptations are specific to the system or muscles trained with exercise); 2) progression (for continued improvement, the volume or intensity must be increased); 3) overload (for an intervention to improve fitness, it must be greater than what the individual is already doing); 4) initial values (improvements in the outcomes of interest must be greatest in those with lower initial values); 5) reversibility (once a training stimulus is removed, fitness levels will eventually return to baseline); and 6) diminishing returns (the expected degree of improvement in fitness decreases as individuals become fit) [22]. The video lasted 50 min and included four parts: 1) warming up (5 min); 2) cardiovascular training (15 min); 3) muscular reinforcement (20 min); and 4) relaxation (10 min). The nature and intensity (low to moderate) of the exercises were adapted to women who had undergone breast cancer surgery. Three levels of intensity were proposed to each patient and she chose the level she preferred according to her perception of her energy level. All exercises were developed by a kinesiologist and approved by a surgical oncologist. The patients had to exercise a minimum of twice a week for 12 weeks.

For the video of the individual physical activity arm, the kinesiologist was filmed doing the exercises. The group intervention physical activity program was exactly the same as the individual one, but it was directly animated by the kinesiologist.

Original data collection scheme

Patients were asked to fill out questionnaires at baseline and at 6 and 12 weeks. Fatigue was assessed using the Functional Assessment of Cancer Therapy - Fatigue Scale (FACT-F, total score), which is a questionnaire with appropriate validity, reliability, and responsiveness [23–25]. Aerobic capacity (VO_2) was measured using the 6-min walk test [26–28]. Muscular strength was measured using a manual dynamometer according to the Andrews' method [29]. This method has been shown to be valid and safe in an elderly population [30]. Quality of life was assessed using the Functional Assessment of Cancer Therapy in General (FACT-G, total score) [31] and the Functional Assessment of Cancer Therapy for Breast Cancer (FACT-B, total score) [32]. Adherence to training was monitored using a journal completed by the patients. Finally, body mass index (BMI), blood pressure, questions about compliance to anti-hormone therapy, blood cell counts, treatments, and surgery were collected. The Godin Leisure-Time Exercise questionnaire [33–36] was used to evaluate the physical activity of the participants. It is a brief questionnaire about the leisure-time exercise habits. The participants are asked their weekly frequencies of strenuous, moderate, and light physical activities, which are multiplied by nine, five, and three, respectively. The total weekly leisure activity is calculated in arbitrary units by summing the individual components. High scores indicate more physical activity. This index also classifies people accordingly three different categories: insufficiently active (<14 units), moderately active (14–23 units), and active (≥24 units) [33–36].

Additional data collection about the willingness to exercise

Because of accrual lower than expected, a survey was conducted in our breast cancer patient population in order to improve our understanding of the level of physical activity and the interest in