Impact of Physical Exercise Programs on Women Diagnosed with Breast Cancer: Repercussion on Chronic Pain

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1. Introduction

Breast Cancer (BC) is the most common cancer in women, if we make a global review of the figures, we see that more and more patients survive this type of cancer. Increased survival depends directly on the implementation of screening programs and advances in the treatment of this disease [1]. The improvement in survival in this group of patients has also made it possible to detect potential medium-long-term adverse effects associated with the treatment. One of the most common adverse effects associated with cancer treatment is the development of chronic pain. Many patients experience persistent pain after treatment, which has a significant impact on their lives.

If we refer to BC, we find that almost 80% of patients will suffer pain at some point during the treatment and if we focus on Chronic Pain (CP), up to 30% of patients will suffer from it [2]. Chronic pain is defined as pain that persists for more than 3 months and is considered a disease in itself, and not a symptom.

In May 2019, the World Health Organization (WHO) published a new international classification of diseases ICD-11 [3]. This new classification divides chronic pain into seven groups. Of the seven groups, there are two that we will frequently find in patients treated for BC, chronic cancer pain and chronic post-surgical or post-traumatic pain:

1. Chronic cancer pain: it is pain caused by the cancer itself or by metastasis; or by its treatment.
2. Chronic pain from cancer or metastasis
3. Chronic pain after cancer treatment
4. Painful chronic polyneuropathy induced by chemotherapy
5. Chronic pain after radiation therapy
6. Post-surgical or post-traumatic chronic pain: pain that develops or increases in intensity after a surgical procedure or tissue injury and that persists beyond the healing process
7. The International Association for the Study of Pain (IASP) defines pain as an unpleasant sensory and emotional experience, associated with or similar to that associated with an actual or potential injury [4]. Pain must be understood from the point of view of the biopsychosocial model, so that it affects most aspects of life, including physical functioning, daily activity, psychological and emotional state, and social life.

Pain affects the psychological, cognitive, social and spiritual domains of patients' lives; in turn, the experience of pain can be influenced by emotional, cognitive, social and spiritual factors. The burden of pain is manifested not only through suffering, but also through impaired function, decreased activity, and alterations in the sense of identity and social role. Uncontrolled or poorly relieved cancer pain has a profoundly negative impact on a patient's quality of life and can even trigger hopelessness, despair, and the desire for an accelerated death.
There are multiple treatment options that can help improve chronic pain in cancer patients. Scientific evidence supports the use of both pharmacological treatment and interventional techniques in the treatment of chronic cancer pain. On the other hand, in recent years the benefits of physical exercise have been emphasized in these patients.

It is well known that regular physical exercise is very positive in cancer patients. Physical exercise has been shown to improve mood, decrease relapses, and improve survival in patients with or who have had cancer [5]. Regular physical exercise has also been shown to be beneficial in improving chronic pain in certain conditions, such as fibromyalgia, chronic fatigue syndrome, chronic low back pain, etc [6]. However, in the current literature, no studies have been found on the impact of physical exercise on chronic pain secondary to cancer treatment, and more specifically on pain secondary to breast cancer treatment.

From our workplace we have started a study that included a group of women operated on for breast cancer and who follow a concurrent physical exercise program, regulated and supervised by experts in physical and sports medicine (Annexed 1.1). In addition to managing this program, these professionals will carry out a series of measurements throughout the study (Annexed 1.2), which will help them to objectify the impact of the exercises on the evolution of the physical state of the patients.

From the point of view of pain medicine, the objective is to assess the impact that physical exercise programs, planned by these professionals, have on the pain of women diagnosed with breast cancer included in the program. This program was implemented last year for the first time, in which about 15 women diagnosed with breast cancer participated, so that a pilot study could be carried out in which it was seen that the pain of the participants improved considerably after the program. That is why we have decided to plan a study in order to follow the evolution of pain in these women and thus be able to draw conclusions about it.

For the study, about 40 women, who suffer or have suffered breast cancer and have received or are receiving treatment for it, have been included. This is an observational and prospective study; of the case series type, in which before starting the exercise programs, they were given a validated questionnaire (Annex 2) to assess the pain situation at that time. Once the program is finished, they will be given the same questionnaire again. In order to assess the impact of these exercise programs not only on a physical level, but also the impact on the pain of patients.

2. Annexed

2.1. Multicomponent Physical Exercise Program

Aerobic training consisted of 20–40 minutes of walking or running based on individual fitness level, 2–3 times a week and for a period of about 8 weeks in duration. During sessions, the work intensity was equivalent to 60-75% of the maximal aerobic velocity determined by VAM test. It was expected that aerobic training would mainly affect VO2max levels. A strength training program based on 40-50% of maximal force obtained from force-velocity curves, was adopted for the purposes of this study [7]. The program lasted for 8 weeks, with up to three 50-minutes sessions per week using guided weight exercises (Smith-Multi-power machines) for both upper and lower body. During the first 2 weeks, exercises comprised low-resistance lifts for learning and get safe adaptations (< 50% of 1 Repetition Maximum [1RM]). For the whole period, a typical session consisted of 5 exercises of 2-3 series each, with 8 out of a total of 30 repetitions in each exercise. A rest period of about 3 minutes was allowed between series and between exercises. Training loads were adjusted based on improvement on mid-term assessment.

2.2. Assessment

Anthropometric measures, muscle strength, maximal oxygen uptake and balance was obtained at baseline, mid-term and at 8 weeks into the intervention. Whole body mass, bone mineral density, muscle and fat mass, were determined through electrical bioimpedance (Tanita MC-780WC). Muscle Strength on essential force training exercises (Force-Velocity curve, González-Badillo & Sánchez-Medina, 2010) [8] was assessed using T-Force (T-Force System, Ergotech, Spain). Maximal oxygen uptake was measured indirectly through a VAM test (adapted from Léger & Boucher, 1980). Dynamic Balance was assessed using force platform and custom software.

References