Influence of Physical Activity on Prostate Cancer Patients Undergoing Radiotherapy and/or Hormone Deprivation Therapy: An Integrative Literature Review

Influência da Atividade Física em Pacientes com Câncer de Próstata Submetidos a Radioterapia e/ou Terapia de Privação Hormonal: Revisão Integrativa da Literatura

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1 INTRODUCTION

Prostate cancer (PC) is the fifth most common cancer worldwide and the second most common neoplasm among men. According to the global cancer observatory website, PC is the most prevalent in Brazil and among men its incidence is 74 cases per 100,000 inhabitants, followed by colorectal cancer with an incidence of 21.1. See official data from the World Health Organization ude and the American Cancer Society in 2018 there were 1,280,000 cases diagnosed and 359,000 deaths from PC in the world. Analyzing these data, we conclude that its prevalence has been growing worldwide, requiring a solid prevention policy.

2 OBJECTIVE

This work aimed to verify in the literature the impacts of regular physical activity in patients with prostate cancer under treatment and after treatment.

3 METHODOLOGY

This is an integrative literature review, we chose to research the following concepts: Prostate, tumor, prostate cancer, physical activity. Then, based on these keywords, the guiding question of the work was produced: What are the impacts of regular physical activity on the quality of life of patients with prostate cancer under treatment or after treatment?

After developing the guiding question, a scan of the PubMed database was performed in the period from September to October 2020. To select the publications related to the theme, the filters available on the platform were used for texts published between January 2010 and December 2020. Thus, the following inclusion criteria were adopted: Scientific articles, published in English, from 2010 to 2020, available online and free of charge in full. The excluded publications were: articles without abstract in the database or incomplete, editorials, letters to the editor, reflective studies, systematic reviews or integrative literature reviews.

After developing the guiding question, locating and selecting articles, 140 potentially eligible publications were identified to be part of this work. With the introduction of the inclusion and exclusion criteria, the sample was composed of 42 articles. To verify that publications would meet the eligibility criteria and answer the guiding question of this review, abstracts of 26 records were examined, of which 19 were excluded and only 7 were analyzed in full to confirm eligibility for quantitative synthesis and data analysis.

4 DEVELOPMENT

In the time frame defined for this study (2010-2020), 7 publications were found and analyzed (table 1). In 2015 and 2017, 2 articles (57.1%) were published each year respectively, whereas in 2016, 2018 and 2019 there is only 1 publication each year (42.9%). The publications resulted from different journals: BMC Cancer, European Urology, BMJ Open, Polish Archives of Internal Medicine and European Journal of Physical and Rehabilitation Medicine. Analyzing the study sites, 2 articles were conducted in Australia (28.6%), 2 articles in Poland (28.6%), 1 article in the United States of America (14.27%), the Netherlands (14.27%), and the United Kingdom (14.27%).

Dawson and collaborators [14], promoted a study to investigate the effects of 12 weeks of resistance training and protein supplementation in men with prostate cancer and under treatment with HDT. 40 volunteers were divided into 4 groups: 1) Resistance training with protein supplementation; 2) Resistance training only; 3) Protein supplementation only, and 4) Control. After the interventions, it was observed that the groups submitted to physical activity significantly improved lean mass, sarcopenia, body fat, strength, and quality of life, when compared to the groups not submitted to exercise. In this context, Taaffe and Collaborators [15], sought to determine the long-term effects of different modes of exercise on fatigue. Between 2009 and 2012, 163 prostate cancer patients on HDT were randomized to participate in the study. Of these patients, 58 exercised the musculoskeletal system with impact loading and resistance training for 12 months; 54 patients exercised the cardiovascular and muscular systems with aerobic and resistance training for 6 months and an additional 6 months of home training; and 51 patients did usual care for 6 months, followed by exercise on a bicycle ergometer for 6 months. They concluded that fatigue was reduced in the impact and resistance exercise groups at 6 months and 12 months, and in the other groups at 12 months. Similarly, vitality increased for all groups at 12 months.

In the article written by Hojan, et al. [16], in which they evaluated the effect of supervised physical exercise on blood inflammatory markers, as well as the relationship of these parameters with functional capacity, fatigue and quality of life in high-risk prostate cancer patients undergoing Radiation Therapy (RT), 2 groups were created: Study Group (27 men) and Control Group (27 men) for the intervention which would be regular Physical Exercise of moderate intensity. There were no significant differences between the study

groups at the initial assessment. After the intervention with physical activity, there was significant improvement in functional capacity and decrease in the levels of pro-inflammatory cytokines and fatigue. The level of fatigue was significantly higher in the control group after RT than before. It was concluded that regular moderate intensity exercise improved functional capacity, decreased the production of inflammatory markers and fatigue, and positively influenced quality of life during the RT period. Regarding the influence of physical activity on the immune system in the presence of tumors, preclinical and clinical studies show that physical activity alters the patterns of immune responses to antitumor cell profiles, at systemic and intratumoral levels, leading to control of the inflammatory state and potentiating a rejection response to the tumor, with synthesis of profile 1 cytokines of T helper lymphocytes, profile 1 of macrophages, and improving the maturation of dendritic cells.

Hojan and co-workers [22], conducted a study to evaluate the effect of a 12-month exercise program on inflammatory and cardiometabolic parameters, as well as functional status, in prostate cancer patients undergoing radiotherapy and androgen deprivation therapy. Thus, 72 volunteers were divided into 2 groups (exercise group and control group). A significant improvement in quality of life, functional capacity, BMI, waist-to-hip ratio, and decreased level of inflammatory cytokines and fatigue was observed in the control group.

According to Buffart, et al. [23], they examined the effects of physical activity for 12 months on the quality of life of prostate cancer survivors. The study included 100 subjects, mean age 71.7 years, who were divided into two groups: 1) EX: a book with detailed instructions for resistance exercise and aerobic exercise; 2) PA: an educational book with recommendations for 150 minutes of aerobic activity per week. It was shown that aerobic and resistance exercises generated beneficial effects for the EX group, increasing quality of life and maintaining physical and social function in relation to the AF group. However, even though the beneficial effects were significant, little changed in the clinical practice of these patients.

Similar results were obtained by Livingston, et al. [24], who evaluated the efficacy of a 12-week exercise program indicated by a physician for men who have completed active treatment for prostate cancer. In this study, two groups were selected: the Intervention Group (54 men) and the Control Group (93 men), with a mean age of 65.6 years. The effects of the exercise program on psychological well-being, quality of life, and objective assessment of physical activity were evaluated. They also evaluated variables such as blood pressure, submaximal fitness, and body mass. As a result they noticed improvement in depressive symptoms, quality of life (improved cognitive function), fitness levels, and physical and mental health.

In a study conducted by Lemanska, et al. in 2019 [25], the acceptability and feasibility of an exercise and diet intervention through community pharmacies on the health and physical activity of men with prostate cancer was evaluated. This study used 116 men with a mean age of 70.4 years whose treatment for prostate cancer had been terminated at least 3 months prior to the study. A personalized exercise program was applied

for each of the participants, through a DVD with exercise instructions and dietary guidelines to be followed. They were followed up by a pharmacist through 2 phone calls and a consultation 3 months after the first evaluation. The individuals showed weight reduction and strength increase. The study concluded that this community pharmacy training improved quality of life and decreased cardiovascular risk.

5 CONCLUDING REMARKS

From the studies presented in this integrative review, we can conclude that there is a limited number of studies on the evaluation of the influence of physical activity on prostate cancer patients. Regarding the positive impacts of physical activity on the quality of life in patients with prostate cancer, the articles showed that both physical activity during treatment, either alone or combined between RT and HDT, and after treatment, improved the quality of life of patients, being responsible for increasing vitality, strength and functional capacity and reducing sarcopenia, fatigue, body fat, inflammatory markers, BMI, blood pressure and cardiovascular risk. Finally, it is suggested that new studies be conducted to confirm and enhance the performance of physical activity in this population.

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