Eur Rev Aging Phys Act (2013) 10:57–59
DOI 10.1007/s11556-012-0111-7

SCIENTIFIC REPORT

Physical exercise programs following cancer treatment

F. T. Baumann

Received: 29 November 2012 / Accepted: 3 December 2012 / Published online: 8 January 2013

Abstract Oncological patients should engage in physical activities during the entire period of medical treatment and aftercare taking into account the contraindications. Therapeutic exercises should be customized, according to the individuals' cancer entity, medical side effects, and exercise experience—personalized exercise therapy. After medical treatment, cancer patients in Germany have a legal right to visit an oncological rehabilitation clinic. In addition, they have the opportunity to attend a rehabilitative sports group, which is funded by the health insurance companies. The aim of therapeutic exercises in the curative and palliative phase is prevention of negative physical and psychological consequences. The aim of therapeutic exercises in the rehabilitation phase is physical and mental recovery as well as psychosocial stabilization or improvement. During aftercare, cancer patients should also be encouraged to engage in home-based programs; however, these are not as effective as supervised therapy. Future studies must consider aspects of training control, specific assessments and exercise programs for palliative patients.

Keywords Cancer · Physical activity · Exercise · Rehabilitation

Introduction

When the first gynecological cancer survivors were supposed to be involved in a 6-week exercise-oriented rehabilitation program in the summer of 1980, the enormous protest was not surprising. The Cologne sports scientist Klaus Schüle conducted the nationwide first feasibility study, in which he was able to demonstrate that physical activity was feasible for gynecological cancer survivors [15]. Numerous studies examining feasibility and effectiveness have been performed since. Studies with an (early) rehabilitative approach show that therapeutic exercise interventions within oncological rehabilitation and after care can be feasible and effective. However, this statement cannot be transferred to all cancer entities, since most studies mainly involve patients with breast cancer, leukemia, or Hodgkin's diseases. Data for other cancer entities is still missing [1, 5, 14].

F. T. Baumann (✉)
Institute of Cardiovascular Research and Sport Medicine, Department of Molecular and Cellular Sport Medicine, German Sport University Cologne, Am Sportpark Müngersdorf 6, 50933 Cologne, Germany
e-mail: f.baumann@dshs-koeln.de

Personalized exercise therapy

A variety of relevant therapeutic aspects may influence physical exercising with oncological patients and therefore must be considered. When planning a therapeutic exercise intervention first of all, the cancer entity and its specific medical treatment have to be taken into account. Fundamental differences between the patient groups, for example between prostate cancer and breast cancer, already appear here. In addition, it is important to consider the stage of the disease, the associated treatment phase (acute, rehabilitation clinic, after care), as well as, the medical therapy approach (curative or palliative). Three factors that are relevant when determining a physical exercise program with oncological patients are:

- Cancer entity and its impact
- Medical treatment and its adverse effects
- Individual background

When defining the aims of physical activity in cancer patients, the following four levels need to be regarded: the physical, psychological, social, and educative level of the patient. These four aims apply to all cancer patients whether

they are in the acute and rehabilitation phase or take part in a home-based program. Yet, the evidence evaluation, regarding the different aims of physical exercise, still varies considerably. Meaningful reviews with various entities indicate that physical activity can reduce the loss of power, counteract cancer related cachexia, reduce treatment-related side effects (nausea, vomiting, and pain), and improve general performance. In addition, physical active patients experience a psychophysical stabilization, including a reduction in depression and anxiety and an increase in confidence. Further research has shown that a targeted and controlled exercise therapy improves quality of life, reduces fatigue, and inhibits the inactivity-induced loss of function in oncological patients. Finally, an increased level of activity reduces the risk of comorbidities such as the metabolic syndrome [3–8, 10, 11, 14, 16].

Physical activities in the rehabilitation hospital

A central and daily question regarding therapeutic exercising with oncological patients is: When to start with the exercise program? In the clinical setting, the trend is to involve exercise therapy as early as possible. The aim here is prevention and stabilization. The loss of power, for example, resulting from the long hospital stay and inactivity can be hampered. Thus, exercise therapy not only has rehabilitative aims but also includes preventive aspect, since a major (health) problem is also the lack of exercise. Exercise therapy should therefore start as early as possible, i.e., already during the medical treatment of cancer [14].

The aim of therapeutic exercises in the curative and palliative phase: Prevention of negative physical and psychological consequences and psychosocial stabilization.

Exercise therapy continues within the rehabilitation center and is then carried on within a rehabilitation sports program in a cancer sports group. In case the participation in a sports group is not possible or not wanted, patients are recommended to exercise individually in order to stay active all their life.

Ideally, patients in the rehabilitation center receive exercise-related diagnostics to determine whether moderate or more intensive physical activities are feasible. Furthermore, the obtained data enables the determination of the exercise therapy's intensity and volume. Yet, the entire medical history, current medication, but also the sporting experiences must be considered, as well as the patient's personal preferences. In order to ensure a targeted-oriented therapy, unsettled questions must be answered at an early stage. A patient will only continue to exercise individually at home, if he/she enjoys his/her activity and feels safe.

The aim of therapeutic exercises in the rehabilitation phase: Regeneration of physical and mental components and psychosocial stabilization or improvement.

Physical activities in the rehabilitative sports group

The ambulatory rehabilitative cancer sports groups in Germany are open for all oncological patients within a curative and palliative treatment concept. In 1981, the first cancer sports group was setup at the German Sport University in Cologne. By now almost 1,000 groups exist in Germany. Since 2001, the statutory health insurance companies (§44 SGB IX, §43 SGB V) are obliged to pay for this exercise offer [17]. The aim is for patients to experience that physical activity is fun and joyful and can improve the overall fitness. In fact, the cancer sport group involves a certain self-help character; yet not to be mistaken with that of a support group. During exercising the cancer disease is "secondary". By means of the rehabilitative sports groups, patients are to be motivated to stay physically active and mobile during their entire lifetime. The range of exercises includes endurance, resistance, and coordination exercises, as well as relaxation techniques. In addition, the groups typically offer further group activities such as hiking, cycling, and cross-country skiing. Despite 30 years of experience and the increasing and improving care structure nationwide, the evidence of the effectiveness of these cancer sports groups is still poor. In fact, only few studies have evaluated the rehabilitation sports in the oncological after-care and therefore only very few scientific experiences with therapeutic exercise interventions within this setting exist. Especially data concerning the implementation, risk factors, and the effects of this therapy concept are still missing [17].

Physical activities within home-based programs

There are different ways to motivate oncological patients to become physically active at their place of residence. In "home-based programs", patients receive a training program and exercise independently without therapeutic support. Studies show that "home-based programs" are not as effective as supervised therapy concepts [12, 13]. Furthermore, investigations show that unsupervised exercises bring about more adverse events or unwanted complications [9]. However, implementing "home-based programs" is reasonable, because the psychosocial influence of a therapist can be excluded, which enables the evaluation of physical activity exclusively. Also true-to-life concepts can be evaluated and implemented.

Prospect

In general, there are still a whole range of subjects that have not been (sufficiently) examined in the field of "cancer and exercise". Only recently, the study question of individualized training control arose. Clearly, different and individualized training programs, depending on cancer entity,

medical treatment, and patients' deficits, are necessary. In addition, the large field of palliative care has hardly been studied so far. An increasing number of patients that cannot be cured of their disease will live longer with cancer. In this context, physical activity has the ability to enrich the improved quantity of life with a corresponding quality. Further, sports medical diagnostics for cancer patients, including specific assessments or valid instruments, is another important field. Meaningful data to determine the endurance performance by means of spiroergometry are, for example, still missing [2]. In this context, we need to conduct further studies in order to improve the scientific statement and to optimize exercise therapy in oncology.

Conflict of interest None.

References

1. Baumann F, Bernhörster M, Dimeo FC, Graf C, Jäger E, Kleine-Tebbe A, Steindorf K, Tschuschke V (2009) Kommission "Krebs und Sport" der Deutschen Krebsgesellschaft. Teil 2: Richtlinien für die Anwendung von Sport und körperlicher Aktivität in der Prävention, supportiven Therapie und Rehabilitation neoplastischer Erkrankungen. Forum–Das offizielle Magazin der Deutschen Krebsgesellschaft eV 5(24):9–12
2. Baumann FT, Bloch W (2010) Evaluierte Trainingsinterventionen während und nach Tumortherapie—eine review analyse. Deutsche Zeitschrift für Sportmedizin 61(1):6–10
3. Baumann FT, Jäger E, Bloch W (2012) Sport und körperliche Aktivität in der Onkologie. Springer, Medizin Berlin
4. Baumann F, Zopf EM, Bloch W (2012) Clinical exercise interventions in prostate cancer patients—a systematic review of randomized controlled trials. Suppor Care Canc 20:212–233
5. Hayes S, Spence R, Galvao D, Newton R (2009) Australian Association for Exercise and Sport Science Position Stand: optimising cancer outcomes through exercise. J Sci Med Sport/Sports Med Australia 12:428–434
6. Humpel N, Iverson D (2005) Review and critique of the quality of exercise recommendations for cancer patients and survivors. Support Care Can 13:493–502
7. Jacobsen PB, Donovan KA, Vadaparampil ST, Small BJ (2007) Systematic review and meta-analysis of psychological and activity-based interventions for cancer-related fatigue. Health Psychol 26:660–667
8. Kangas M, Bovbjerg DH, Montgomery GH (2008) Cancer-related fatigue: a systematic and meta-analytic review of non-pharmacological therapies for cancer patients. Psychol Bull 134:700–741
9. Kilgour RD, Jones DH, Keyserlingk JR (2008) Effectiveness of a self-administered, home-based exercise rehabilitation program for women following a modified radical mastectomy and axillary node dissection: a preliminary study. Breast Cancer Res Treat 109:285–295
10. Knols R, Aaronson NK, Uebelhart D, Fransen J, Aufdemkampe G (2005) Physical exercise in cancer patients during and after medical treatment: a systematic review of randomized and controlled clinical trials. J Clin Oncol 23:3830–3842
11. McNeely ML, Campbell KL, Rowe BH, Klassen TP, Mackey JR, Courneya KS (2006) Effects of exercise on breast cancer patients and survivors: a systematic review and meta-analysis. CMAJ 175:34–41
12. Overgard M, Angelsen A, Lydersen S, Mørkved S (2008) Does physiotherapist-guided pelvic floor muscle training reduce urinary incontinence after radical prostatectomy? A randomised controlled trial. European Urology 54:438–448
13. Parekh AR, Feng MI, Kirages D, Bremner H, Kaswick J, Aboseif S (2003) The role of pelvic floor exercises on post-prostatectomy incontinence. J Urol 170(1):130–133
14. Schmitz KH, Courneya KS, Matthews C, Demark-Wahnefried W, Galvão DA, Pinto BM, Irwin ML, Wolin KY, Segal RJ, Lucia A, Schneider CM, von Gruenigen VE, Schwartz AL (2010) American College of Sports Medicine roundtable on exercise guidelines for cancer survivors. Med Sci Sports Exe 42(7):1409–1426
15. Schüle K (1983) Zum Stellenwert von Sport- und Bewegungstherapie bei Patientinnen mit Brust- und Unterleibskrebs. Rehabilitation 22(1):36–39
16. Wiskemann J, Huber G (2008) Physical exercise as adjuvant therapy for patients undergoing hematopoietic stem cell transplantation. Bone Marrow Transplant 41:321–329
17. Zopf ME, Braun M, Machtens S, Zumbé J, Bloch W, Baumann FT (2012) Implementation and scientific evaluation of rehabilitative sports groups for prostate cancer patients: study protocol of the ProRehab Study. BMC Cancer 12:312. doi:10.1186/1471-2407-12-312