

Xbox 360 Kinect exercise for men receiving androgen deprivation therapy for prostate cancer

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Introduction

The incidence of prostate cancer was 4060 in Denmark in 2010 (1). Prostate cancer is mostly treated with radical prostatectomy, radiation therapy, androgen deprivation therapy and chemotherapy. Metastatic prostate cancer is treated with androgen deprivation therapy and chemotherapy (2-5). The treatment reduces the production of testosterone but adverse effects such as hypercholesterolemia, obesity, type 2 diabetes, osteoporosis, loss of muscle mass and muscle strength, decreased quality of life, increased risk of cardio-vascular disease and increased fatigue are well known in this patient population. (6-30). Some of these adverse effects are part of the metabolic syndrome, and newer studies show, that metabolic syndrome occurs in more than 50 % of men receiving long-term androgen deprivation therapy (31), and there is a significant correlation between the duration of treatment and the degree of insulin resistance, fasting glucose and waist circumference (32).

Resistance and aerobic exercise increase muscle mass, muscle strength, cardio-vascular fitness, walking distance, improves insulin-like growth factor-I, quality of life, immune system, physical function, suppleness and haemoglobin percentage (33). Studies also show less nausea, fatigue, disease symptoms, fat mass, lower pulse rate and lower systolic blood pressure (34-46).

Resistance and aerobic exercise is successful in preventing the adverse events of androgen deprivation therapy but this type of exercise is mostly performed outside the home.

There is a need for finding the most optimal and individual exercise plan for men with prostate cancer receiving androgen deprivation therapy, and according to the literature studies investigating home based exercise are called for to examine the potential in this exercise modality (20, 22, 45-48).

Interactive video games can be used for home based exercise. The Nintendo Wii system has been used in cancer patients with positive effect on mood, fatigue and physical function (49-50), and in the older population, an exercise intervention with Nintendo Wii has shown an 18 % increase in muscle strength, and the participants in the study were amused by this type of exercise (51). The Xbox 360 Kinect interactive video game gives the person playing more room for free movement and therefore might offer more possibilities than Nintendo Wii. Xbox can be used for high intensity home based exercise (52) and has shown positive results on motor function and activities of daily living in a study with rehabilitation of chronic stroke patients (53). To the best of our knowledge there has not been published any studies with the Xbox in rehabilitation of cancer patients.

Men receiving androgen deprivation therapy need information about the adverse effects of androgen deprivation therapy, the treatment and the prevention of it and how important is it to perform exercise. Nurses are in a unique position to support and help patients through health promoting lifestyle changes (54). The nurse can give oral information accompanied by a leaflet with specific suggestions to lifestyle changes, which can prevent and treat the adverse effects of androgen deprivation therapy (55). And a physiotherapist can give practical instructions to a safe and effective exercise programme (56).

In this study we examine whether the patient comply with an exercise programme using Xbox 360 Kinetic and experience higher quality of life and less fatigue based on the information and support given by a nurse accompanied with exercise instructions given by a physiotherapist.

Aim

The aim of this study is to determine the efficacy of patient information about adverse effects of androgen deprivation therapy and the information about the importance of compliance to a 6 months exercise program using the Xbox system in order to prevent and/or overcome adverse effects to the treatment for prostate cancer.

Hypothesis

Information given by a nurse about androgen deprivation therapy and preventing or treating adverse effects via a 6 month exercise program using the Xbox 360 Kinetic system will probably ensure that patients comply with the exercise programme and therefore experience less fatigue and higher quality of life.

Short literature review

A systematic literature review has been conducted, and the findings have been integrated in the introduction. The literature search was performed in the PubMed, Cochrane and Cinahl databases using MeSH terms where possible. The search terms used were: prostate cancer, androgen deprivation therapy, metabolic syndrome, exercise, Nintendo Wii, Xbox, nursing intervention.

Relevance to urology nursing

Urological nurses administer androgen deprivation therapy and therefore they have a great opportunity to talk with patients about adverse effects and how to prevent and treat them. Urological nurses are in a unique position to support lifestyle changes and therefore play a very important role in the prevention and treatment of adverse effects in this patient population. Seeing the patients from time to time the urological nurse can discuss the lifestyle change with the patients.

Methodology

90 men receiving androgen deprivation therapy for prostate cancer will be randomly assigned to either patient information about adverse effects of androgen deprivation therapy and information about the importance of compliance with a 6 months exercise program using the Xbox system (n=45) or usual care/no detailed information about adverse effects and the importance of exercise (n=45).

The exercise will be performed for at least 90 minutes pr. week in the patients own home.

There is an expected drop out rate of about 20 patients due to the long intervention period.

The study team will not know which group patients get randomised to.

Study procedures

At baseline a trained nurse will support and help the patient to a lifestyle change by informing the patient about prevention and treatment of adverse effects of androgen deprivation therapy and the importance of exercise using the Xbox 360 Kinect system. The patient will receive a leaflet with the oral information in print.

The patient will be asked to fill out the EORTC QLQ-C 30 and FACIT – F questionnaire at baseline, end of intervention and 6 months after end of intervention.

A physiotherapist gives the patients two lessons of practical instruction to the Xbox 360 Kinect exercise programme to make sure, the patient will be able for perform the exercise in their own home.

The patient will be asked to keep a diary of the exercise programme.

Study population

Inclusion criteria

Male > 18 years old, diagnosed with prostate cancer where androgen deprivation therapy is needed and still effective, performance status 0-1, signed informed consent, being able to read and understand Danish.

Exclusion criteria

Men who within 3 months from inclusion have performed regular intensive exercise more than twice a week, hemoglobin ≤ 6.0 mmol/l, the use of narcotic drugs, any mental or physical condition that makes the patient unsuitable for inclusion, men at risk of getting an osteoporotic fracture due to long term use of steroids or earlier fractures, participation in other intervention studies, no access to a television.

Outcome measures

Adherence to the exercise programme by going through the exercise diary, fatigue measured on the FACIT-F questionnaire, quality of life measured on the EORTC QLQ-C30 questionnaire.

Statistical considerations

Data will be evaluated using the Mann-Whitney test for unpaired measurements and Wilcoxon Signed Ranks Test for paired measurements. There will be a confidence interval of 95%.

Feasibility

Timetable

August 2013 – February 2014: development of project plan

June 2014: inclusion starts

December 2016: inclusion ends

December 2017: research articles will be sent to peer review in international scientific publications

Spring 2018: presentation of research results at EAUN

Statistical analysis will be done continuously.

Budget

Nursing hours in the intervention group: 3 hours x 45 patients	4644 €
Nursing hours in the control group: 2½ hours x 45 patients	3870 €
Physiotherapist hours in intervention group: 2 hours x 45 patients	2640 €
Questionnaires including software programme:	2000 €
27 Xbox 360 Kinetic systems and games:	9720 €

The EAUN budget will be used for buying Xbox 360 Kinect systems.

Applications have been sent and will be sent to several private and public funds to cover the costs.

Relevance

This project is expected to show the potential in a nursing intervention that help and support cancer prostate patients to begin a lifestyle change which can improve their quality of life and health. It is also expected that the nursing intervention will put adverse effects of androgen deprivation therapy such as fatigue and metabolic syndrome into focus because nurses are presumed to be able to prevent some adverse effects for some men in this patient population.

The Xbox system represents a new exercise regimen that gives patients the opportunity to have fun together with relatives or friends while fighting the adverse effects of androgen deprivation therapy. And finally the interdisciplinary health team strengthens when physiotherapists get involved by supporting the nursing intervention when instructing the patients in a safe and effective exercise program.

Conflicts of interests

To our knowledge there are no possibly conflict of interests.

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