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JOURNAL-BASED CME ARTICLE

The Effectiveness of a Deep Water Aquatic Exercise Program in Cancer-Related Fatigue in Breast Cancer Survivors: A Randomized Controlled Trial

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Statement of Need

Cancer-related fatigue (CRF) is mainly characterized by tiredness to exhaustion, which is not precipitated by activity. It can also occur after activity if it is out of proportion to the level of exertion and is not relieved by or in fact may be worsened with rest. Between 56% to 95% of breast cancer survivors experience CRF after treatment. Nearly 20% of breast cancer survivors can suffer from CRF several years after completing treatment. A moderate to high level of CRF is associated with reduced quality of life and perceived as a barrier to exercise, thus justifying the need to seek different methods of treatment for these patients.

Previous research has investigated the effects of exercise as a nonpharmacologic treatment for CRF with clinical impact ranging from small to moderate effect sizes on CRF; these studies have mainly focused on land-based exercise programs, although many benefits can be obtained in an aquatic environment. Different properties of water could increase potential benefits of exercise, such as buoyancy, which significantly decreases stress on weight-bearing joints, bones, and muscles, thereby reducing pain.

Exercise can reduce depression, anxiety, and improve mood state in breast cancer survivors. Aquatic group exercise interventions have also been shown to improve psychological state in several conditions.

This journal-based activity has been planned and developed in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the sponsorship of Professional Education Services Group (PESG).

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PESG designates this Journal-based CME activity for a maximum of 2.0 *AMA PRA Category 1 Credit(s)*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

All other health care professionals completing continuing education credit for this activity will be issued a certificate of participation.

Educational Objectives

To support the attainment of knowledge, competence, and performance, the learner should be able to achieve the following objectives:

1. Identify the components of deep water aquatic exercise for cancer-related fatigue and how they can be applied in practice.
2. List the outcomes of deep water aquatic exercise for cancer-related fatigue.
3. Compare deep water aquatic exercise for cancer-related fatigue to other modalities.
4. Evaluate the limitations of deep water aquatic exercise for cancer-related fatigue.

Planning Committee

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Faculty Profiles & Disclosure Information

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2. Any limitations on the information presented, such as data that are preliminary or that represent ongoing research, interim analyses, and/or unsupported opinion. Faculty may discuss information about pharmaceutical agents that is outside of FDA-approved labeling. This information is intended solely for CME and is not intended to promote off-label use of these medications. If you have questions, contact the medical affairs department of the manufacturer for the most recent prescribing information.

Intended Audience

This program is intended for physicians and health care professionals responsible for the comprehensive care for individuals with chronic illness and disabilities.

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Method of Participation

In order to claim credit, participants must complete the following:

1. Pre-activity self-assessment questions
2. Read the activity
3. Complete the CME Test and Evaluation. Participants must achieve a score of 70% on the CME Test.

Participants can complete the pre-activity self-assessment and CME Test and Evaluation online by logging on to http://acrm.cds.pesgce.com. Upon successful completion of the online tests and evaluation form, you can instantly download and print your certificate of credit.

To better define and meet the CME needs of health care professionals and enhance future CME activities, PESG will conduct an outcomes-measurement survey following the conclusion of the program. This follow-up survey is designed to measure changes to participants' practice behaviors as a result of their participation in this CME activity. You will be contacted by e-mail 60 days following the conclusion of this activity with an outcomes measurement survey. We would greatly appreciate your participation.

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This continuing education activity is active starting February 1, 2013 and will expire January 31, 2014.

Estimated time to complete this activity − 2.0 hours

Abstract

Objective: To investigate the effectiveness of an 8-week aquatic program on cancer-related fatigue, as well as physical and psychological outcomes in breast cancer survivors.

Design: A randomized controlled trial.

Setting: Outpatient clinic, urban, academic medical center, and a sport university swimming pool.

Participants: Breast cancer survivors (N=68) were randomly assigned to either an experimental (aquatic exercise group in deep water pool) group or a control (usual care) group.

Interventions: The intervention group attended aquatic exercise sessions 3 times per week for 8 weeks in a heated deep swimming pool. Sessions lasted 60 minutes in duration: 10 minutes of warm-up, 40 minutes of aerobic and endurance exercises, and 10 minutes of cool-down exercises. Patients allocated to the usual care group followed the oncologist's recommendations in relation to a healthy lifestyle.

Main Outcome Measures: Values for fatigue (Piper Fatigue Scale), mood state (Profile of Mood States), and abdominal (trunk curl static endurance test) and leg (multiple sit-to-stand test) strength were collected at baseline, after the last treatment session, and at a 6-month follow-up.

Results: Immediately after discharge, the aquatic exercise group showed a large effect size in total fatigue score (d=.87; 95% confidence interval, .48−1.26), trunk curl endurance (d=.92; 95% confidence interval, 1.97−3.83), and leg strength (d=1.10; .55−2.76), but negligible effects in vigor, confusion, and disturbance of mood (d<.25). At the 6-month follow-up period, the aquatic exercise group maintained large to small effect sizes in fatigue scores, multiple sit-to-stand test, and trunk curl static endurance (.25>d>.90) and negligible effects for the fatigue-severity dimension and different scales of the Profile of Mood States (d<.25).

Conclusion: An aquatic exercise program conducted in deep water was effective for improving cancer-related fatigue and strength in breast cancer survivors.

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Cancer-related fatigue (CRF) is mainly characterized by tiredness to exhaustion that is not precipitated by activity. It can also occur after activity if it is out of proportion to the level of exertion and is not relieved by or in fact may be worsened with rest.[1] Between 56% and 95% of breast cancer survivors experience CRF after treatment.[2] Close to 20% of breast cancer survivors can suffer CRF several years after finishing their curative treatment.[3,4] A moderate to high level of CRF is associated with reduced quality of life in these patients[1,5-7] and is perceived as a barrier to include exercise in their lifestyle,[8] justifying the need to seek different methods of treatment for these patients.

Previous research has investigated the effects of exercise as nonpharmacologic treatment for CRF,[9-11] with clinical impact ranging from small to moderate effect sizes on CRF.[10-12] There continues to exist limited research examining the effects of exercise for patients with cancer who experience CRF.[7,12,13] New studies are necessary to identify optimal treatment options for individuals with CRF to improve their quality of life.

A potential contributor to CRF may be abnormalities of energy balance,[14] which are associated with diminution of muscle biosynthesis.[15] These deficits are sensitive to neuromuscular measures of skeletal muscle endurance.[16] In fact, deficits in muscular performance are associated with a reduction in the quality of life and increase in symptoms related to cancer in breast cancer survivors.[17,18]

Previous research has mainly focused on land-based exercise programs, but many benefits can be obtained with the aquatic environment. Different properties of water such as buoyancy, which significantly decreases the stress on weight-bearing joints, bones, and muscles, thereby reducing pain, can increase the potential benefits of exercise.[19] Water immersion decreases axial loading, allowing patients to perform exercises that they are otherwise unable to do on land.[20] Different resources can be used in aquatic therapy. A chest-high pool is used to reduce pain and stiffness during weight-bearing exercise. A recent report[21] found that water exercise in a chest-high pool had no effect on CRF in breast cancer survivors suffering from hormone therapy−associated arthralgia pain. Exercises such as running in deep water produce a lower heart rate, which may relate to hydrostatic pressure and water depth and the subsequent increase in venous return and stroke volume.[22] These physiological responses result in lower perceived exertion than would be experienced with the same exercise intensity conducted on land.[23] It is not known whether an aquatic exercise program could result in reductions in CRF.

Exercise has shown the ability to reduce depression[24] and anxiety[25] and improve mood[26] state in breast cancer survivors.

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