Exercise and Breast Cancer

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Background

There is a small amount of data on the role of exercise in cancer patients undergoing chemotherapy, but many of the studies are limited by small size, imperfect design or patient selection. More information about exercise in outpatient chemotherapy patients is needed, as are more comprehensive studies of the effects of chemotherapy on functional status and psychological states.

In the mid 1980s, MacVicar and Winningham, two oncology nurses, began studying exercise in breast cancer patients (1-3). They noticed that patients who exercised during treatment experienced positive mood enhancing effects, and, incidently, reported less nausea (1). This led to a second study in 42 breast cancer patients, which confirmed that those who exercised experienced less nausea than the non-exercisers or those who stretched only (2). A third, similar study found that patients who exercised had significant improvements in functional capacity, as measured by Vo2Lmax (3).

In 1991, Young-McCaughan and Sexton investigated the relationship between exercise and quality of life (QOL) (4). This retrospective study of 42 previously treated breast cancer patients found that those who had exercised during treatment had a significantly improved quality of life (based on an 18 question QOL Index) than the non-exercisers. This study was limited by size, as well as retrospective design and the select group of predominately white, upper class women with early stage breast cancer. Similarly, a study by Mock et al enrolled 14 predominately white, married, college educated women with breast cancer, with nine of them participating in a comprehensive rehabilitation program of walking and support groups. They noticed increased physical performance, and less fatigue, difficulty sleeping, and depression among the rehabilitation patients (5).

There has also been research in the area of fatigue in chemotherapy patients. In a retrospective study, Schwartz reported patients felt physically renewed and more alert after exercise (6), though in this study the patients were recalling events that occurred several years prior to the questionnaire. Dimeo, et al have performed a number of studies on patients receiving high dose chemotherapy with stem cell transplant, and have reported benefits of exercise ranging from increased physical performance and decrease in fatigue (7-10), decreased duration of pancytopenia (8,9), and other toxicities, such as severity of diarrhea and pain, and length of hospitalization (9). Furthermore, psychological parameters, such as somatization, anxiety, and obsessive compulsive traits were significantly decreased in exercise groups (11). It may be difficult, however, to apply these data to other cancer patients, who are outpatients and receiving lower doses of chemotherapy.

We plan to study a population of women undergoing outpatient adjuvant chemotherapy for breast cancer, assessing the impact of exercise on chemotherapy related toxicities and quality of life. The study will be questionnaire-based and prospective, comparing toxicities among patients, and attempting to correlate toxicity with amount of exercise.

IRB PROTOCOL

A. Study Purpose and Rationale

To assess the impact of aerobic exercise on incidence of treatment related complications and quality of life on women undergoing adjuvant chemotherapy for breast cancer.

B. Study Design and Statistical Analysis

A prospective, randomized study assessing exercise versus usual care among patients at the medical oncology clinic at New York Presbyterian Hospital who will be undergoing adriamycin-based adjuvant chemotherapy for breast cancer.

There will be two groups, the control (usual activities) group and the exercise group. Eligible patients will be randomly assigned to one of the groups, and at all further evaluations the investigator will be blinded to the study group. A total of 120 women will be enrolled. Chi-square tests will be used to analyze the data.

C. Study Procedures

A questionnaire will be completed during the regularly scheduled clinic visit prior to the first cycle of chemotherapy. This will provide baseline data on exercise habits and quality of life prior to treatment and before and after breast cancer diagnosis. Other baseline data, such as smoking status, will be obtained from the chart. Karnofsky score will be obtained by an investigator blinded to study group at baseline and at the clinic visit after therapy is complete.

Exercise and toxicity questionnaires will be completed during regularly scheduled clinic visits prior each cycle of chemotherapy. Quality of life questionnaires will be completed every three cycles, and at the end of treatment. Patients will keep journals to help recall the amount of exercise performed and side effects experienced.

Complete blood counts will be obtained from each patient on the day of the clinic visit and midway through each cycle of chemotherapy. The investigators will review the laboratory data in order to assess continued eligibility for exercise and the need for blood products or growth factors. No comparison of values will be performed until completion of the study.

Patients in the control group will be advised to continue with their daily activities as tolerated. If they are exercisers at baseline, they will not be asked to discontinue exercise. The study group will be instructed to perform any type of exercise (walking, swimming, aerobics, etc.), for a minimum of 3 times per week, 30 minutes each session. Information regarding exercise will be provided, and questions will be answered. Patients will be advised to postpone exercise if their blood counts reveal severe thrombocytopenia (platelets <20), anemia (hemoglobin <8) or neutropenia (ANC<500), or if they have fever (t>101) until counts normalize or fever resolves.

Regular contact with all patients in the study will be made by telephone in addition to the clinic appointments, to attempt to keep the exercise group motivated to continue their regimens. Conversations unrelated to exercise will be made with the control group so as to not enter bias.

D. Study Drugs

None. All patients will receive adjuvant chemotherapy with an adriamycin-based regimen for the standard number of cycles.

E. Medical Devices

None

F. Study Questionnaires

See attached sheets

G. Study Subjects

All women age ≥18 with histologically confirmed breast cancer, stages I, II, or III, beginning adjuvant chemotherapy at the Breast Oncology Outpatient Clinic at New York Presbyterian Hospital and/or from the private clinics of medical oncologists affiliated with NYPH will be considered for the study. Patients will be screened for eligibility by resting EKG and history, and a MUGA scan will be performed. Exclusion criteria will include any contraindications to exercise, such as physical disability, or major health problems which significantly impact their general well being, such as COPD, heart failure, or cognitive dysfunction. A Karnofsky score of ≥80% at baseline will be required, as will signed informed consent.

H. Recruitment of Subjects

Patients will be approached during a regular clinic visit prior to starting chemotherapy. The study will be described and consent obtained.

I. Confidentiality of Study Data

All data will be contained in the clinic area, with access available only to investigators.

J. Potential Conflict of Interest

None

K. Location of the Study

Investigators will perform all aspects of the data collection in clinic. The study group will perform their exercise during their own time and in the location of their choice. No one form of exercise or location will be advocated specifically by the investigators.

L. Potential Risks

Minimal risks will be involved. Patients will be explained the risks and benefits of the chemotherapy.

M. Potential Benefits

Patients may or may not receive benefit from the exercise, such as improved functional status and ability to carry on daily activities, less severe treatment induced toxicities, and an improved quality of life.

N. Alternative Therapies

None

O. Compensation to Subjects

None

P. Costs to Subjects

Costs will be minimal. There should be no travel to the clinic outside of the regularly scheduled appointments. Journals and information regarding exercise will be provided.

Q. Minors as Research Subjects

None

R. Radiation or Radioactive Substances

None

INITIAL QUESTIONNAIRE

1 . What type/types of physical activity do you do? (Hours/week)
Housework
Swimming
Walking
Running
Bike riding
Aerobics
Other - please specify

2. How many hours per week did you spend exercising prior to your diagnosis of breast cancer?
0-2
2-4
4-6
6-8
>8

3. How many hours per week do you spend exercising now?
0-2
2-4
4-6
6-8
>8

4. Which of the following did you experience prior to your diagnosis?
Fatigue/lethargy
Nausea/vomiting
Diarrhea
Poor appetite
Pain
Depression
Muscle aches
Mouth ulcers

5. Are you currently working?
If so
Part time
Full time

6. If so, what is your occupation?

QUESTIONNAIRE - EACH CYCLE OF CHEMOTHERAPY

1. How many hours per week did you spend exercising after the last cycle of chemotherapy?
   0-2
   2-4
   4-6
   6-8
   >8

2. Specify when you commenced exercise post chemotherapy

3. Which activities have you changed in your life routine since starting chemotherapy? (Specify number of hours increased or decreased)
   Housework
   Swimming
   Walking
   Running
   Bike riding
   Aerobics
   Other - please specify

4. Which of the following have you experienced since your last cycle of chemotherapy? (specify duration of symptoms)
   Fatigue/lethargy
   Nausea/vomiting
   Diarrhea
   Poor appetite
   Muscle aches
   Mouth ulcers
   Pain
   Depression
   Fever/infection
   Hospitalization

5. List of current medications

6. Did you work after your last cycle of chemotherapy?

7. If yes, quantify Part time Full time

FACT-B (Version 3)

Below is a list of statements that other people with your illness have said are important. By circling one number per line, please indicate *how* true each statement has been for *you during the past 7 days.*

PHYSICAL WELL-BEING	not at all	a little bit	some-what	quite a bit	very much
1. I have a lack of energy	0	1	2	3	4
2. I have nausea	0	1	2	3	4
3. Because of my physical condition, I have trouble meeting the needs of my family	0	1	2	3	4
4. I have pain	0	1	2	3	4
5. I am bothered by side effects of treatment	0	1	2	3	3
6. I feel ill	0	1	2	3	4
7. I am forced to spend time in bed	0	1	2	3	4

8.Looking at the above 7 questions, how much would you say your PHYSICAL WELL-BEING affects your quality of life?(circle one number)

0 1 2 3 4 5 6 7 8 9 10
Not at all Very much so

SOC1AL/FAMILY WELL-BEING	not at all	a little bit	some-what	quite a bit	very. Much
9. I feel distant from my friends	0	1	2	3	4
10. I get emotional support from my family	0	1	2	3	4
11. I get support from my friends and neighbors	0	1	2	3	4
12. My family has accepted my illness	0	1	2	3	4
13. Family communication about my illness is poor	0	1	2	3	4
14. 1 feel close to my partner (or the person who is my main support)	0	1	2	3	4
15. Have you been sexually active during the past year? No ___ Yes ___, If yes: I am satisfied with my sex life	0	1	2	3	4

10. Looking at the above 7 questions, how much would you say your SOCIAL/FAMILY WFLL-BEING affects your quality of life? (circle one number)

0 1 2 3 4 5 6 7 8 9 10
Not at all Very much so

RELA TIONSHIP WITH DOCTOR	not at all	a little bit	some-what	quite a bit	very. much
17. I have confidence in my doctor(s)	0	1	2	3	4
18. My doctor is available to answer my questions	0	1	2	3	4

19. Looking at the 2 questions, how much would you say your RELATIONSHIP WITH THE DOCTOR affects your quality of life, (circle one number)

0 1 2 3 4 5 6 7 8 9 10
Not at all Very much so

EMOTIONAL WELL-BEING	not at all	a little bit	some-what	quite a bit	very. Much
20. I feel sad	0	1	2	3	4
21. I am proud of how I'm coping with my illness	0	1	2	3	4
22. I am losing hope in the fight against my illness	0	1	2	3	4
23. I feel nervous	0	1	2	3	4
24. I worry about dying	0	1	2	3	4
25. I worry that my condition will get worse	0	1	2	3	4

26. Looking at the above 6 questions; how much would you say your EMOTIONAL WELL-BEING affects your quality of life (circle one number)

0 1 2 3 4 5 6 7 8 9 10
Not at all Very much so

FUNCTIONAL WELL-BEING	not at all	a little bit	some-what	quite a bit	very. Much
27. I am able to work (include work in home)	0	1	2	3	4
28. My work (include work in home) is fulfilling	0	1	2	3	4
29.I am able to enjoy life	0	1	2	3	4
30.I have accepted my illness	0	1	2	3	4
31. I am sleeping well	0	1	2	3	4
32. I am enjoying the things I usually do for fun	0	1	2	3	4
33. I am content with the quality of my life right now	0	1	2	3	4

34. Looking at the above 7 questions, how much would you say your FUNCTIONAL WELL-BEING affects your quality of life? (circle one number)

0 1 2 3 4 5 6 7 8 9 10

Not at all Very much so

CANCER THERAPY-BREAST QUALITY-OF-LIFE INSTRUMENT *ADDITIONAL CONCERNS*	not at all	a little bit	some-what	quite a bit	very much
35.1 have been short of breath	0	1	2	3	4
36. I am self-conscious about the way I dress	0	1	2	3	4
37. One or both of my arms are swollen or tender	0	1	2	3	4
38. I feel sexually attractive	0	1	2	3	4
39. I am bothered by hair loss	0	1	2	3	4
40. I worry about the risk of cancer in other family members	0	1	2	3	4
41. 1 worry about the effect of stress on my illness	0	1	2	3	4
42. 1 am bothered by a change in weight	0	1	2	3	4
43. I am able to feel like a woman	0	1	2	3	4

44.. Looking at the above 9 questions, how much would you say these ADDITIONAL CONCERNS affect your quality of life? (circle one number)

0 1 2 3 4 5 6 7 8 9 10

Not at all Very much so

TOXICITY DATA - EACH VISIT

KPS

Weight

BP

NCI Common Toxicity Criteria	Grade I	Grade 2	Grade 3	Grade 4
Fatigue/lethargy				
Nausea				
Vomiting				
Diarrhea				
Pain				
Depression				
Myalgias				
Mucositis				
Fever				
Other				

Use of G-CSF

Treatment delay?

Hospitalization?

Current medications

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