Complementary Therapies in Clinical Practice 20 (2014) 193–196

Contents lists available at ScienceDirect

Complementary Therapies in Clinical Practice

journal homepage: www.elsevier.com/locate/ctcp

The effect of autogenic training on salivary immunoglobulin A in surgical patients with breast cancer: A randomized pilot trial

Chika Minowa [a, *], Kikuyo Koitabashi [b]

[a] School of Nursing, Saku University, 2384 Iwamurada, Saku, Nagano 385-0022, Japan
[b] Gunma University Graduate School of Health Sciences, 3-39-22 Showa-machi, Maebashi, Gunma 371-8514, Japan

Keywords:
Relaxation
Autogenic training
Immune function
Breast cancer
Immunoglobulin A

A B S T R A C T

Psychological stress among breast cancer patients can inhibit immune function and contribute to disease progression. We investigated the effects of autogenic training (AT), a relaxation method for reducing stress, on salivary immunoglobulin A (sIgA) in breast cancer surgery patients. Thirty patients scheduled to undergo breast cancer surgery were randomly assigned to an AT or control group (usual care). Patients in the AT group underwent training for 7 days after surgery. Salivary IgA and heart rate variability were assessed on the day before surgery, and on the third and seventh postoperative days. Levels of sIgA were significantly higher on the seventh postoperative day in the AT group ($n = 7$) compared to the control group ($n = 7$) ($p = 0.049$). These findings suggest that AT may improve immune function in breast surgery patients.

1. Introduction

The worldwide incidence of breast cancer is rapidly increasing. Previous studies have reported that psychological stress is high (40–50%) among breast cancer patients in the first year following diagnosis and is prevalent in nearly 25% of patients several years after receiving primary treatment [1–4]. Psychological stress can inhibit cellular immune responses in patients following breast cancer diagnosis and surgical treatment [5], and resistance to cancer tumor progression may be related to immune function. Studies have shown that mental health status can affect the prognosis and recurrence of cancer [6]. Therefore, there is increased interest among breast cancer patients in complementary and alternative medicine (CAM) for healing, well-being, and psychological stress reduction [7]. Along with other perceived benefits of CAM therapies, most breast cancer patients anticipate boosting their immune functions [8].

Autogenic training (AT) has been used to treat patients experiencing a strong anxiety response [9]. Several studies have reported that AT can reduce patient anxiety in various situations [10–12], and the relaxation response appears to benefit patients physically as well as psychologically. For example, patients report that their hands and feet become warm, their pulse rate slows, and their blood pressure is reduced during AT. Although immune responses normally decrease after surgery [13,14], Hidderley and Holt [15] reported that patients who underwent AT after breast cancer surgery and adjuvant radiotherapy had increased immune responses. Therefore, AT may be able to hasten postoperative recovery and minimize the reduction in immune responses. We designed a randomized clinical trial comparing AT intervention with usual care following breast cancer surgery in order to investigate the effect of AT on salivary immunoglobulin A (sIgA) as one of the indicators of immune function.

2. Methods

2.1. Participants

Women scheduled for breast cancer surgery were recruited from Asama General Hospital. Participants had to be >20 years old, could understand Japanese (the language of the intervention and study forms), and had to be able to use a compact disc (CD) player. Patients were ineligible if they had previously undertaken AT or another self-relaxation practice, or if they had major mental illness, severe complications, or heart arrhythmia preventing analysis of heart rate variability (HRV). Patients were randomly assigned to the AT group or the control group using a computer-generated randomization technique.

* Corresponding author. Tel.: +81 267 68 6680; fax: +81 267 68 6687.
E-mail addresses: minowa@saku.ac.jp (C. Minowa), kkoita@health.gunma-u.ac.jp (K. Koitabashi).

http://dx.doi.org/10.1016/j.ctcp.2014.07.001
1744-3881/

2.1.1. Ethical considerations

The study protocol was reviewed and approved by the Saku University Ethics Committee and Asama General Hospital Ethics Committee, and all participants provided written informed consent. Patients were enrolled from September 2011 to June 2013.

2.2. Intervention

All patients received standard care and met with the same interventionist (C.M.). Participants were taught AT individually and received a leaflet containing information about the exercise along with a CD containing instruction in the AT technique (Prem Promotions Inc., Tokyo, Japan), a CD player, and earphones. The CD was recorded by Gunma University Hospital Relaxation Visitors, a group affiliated with the medical school. It contained 20 min of relaxing music and the first and second verbal formulas for inducing heaviness and warmth based on the Shultz-type AT technique. The Japanese Society of Autogenic Therapy indicates that it is enough to measure heaviness and warmth to determine relaxation during AT. The AT procedure described in the CD was in accordance with standard practice recommended by the Japanese Society of Autogenic Therapy. Because the participants were exercising AT for the first time, the CD contained music to help them relax. Participants were instructed to conduct AT by themselves three times a day for 7 days following surgery while hospitalized. Collection of salivary samples was carried out between 7 and 9 p.m. to minimize the effects of circadian rhythms on sIgA. HRV power was determined at an average of 5 min before and after AT during which time participants were asked to lie on the bed. The AT and control group subjects rested quietly on bed for the same amounts of time.

2.3. Measurements

Demographic and clinical data were collected using an electronic medical chart. Trait anxiety score at baseline was assessed by using the Japanese version of Spielberger's State-Trait Anxiety Inventory (Jitsumu Kyoiku Press Inc. Tokyo Japan).

2.3.1. Immunoglobulin A

Salivary IgA is an antibody produced by B-cells that provides protection against pathogens that multiply in the mucosal epithelium in the oral cavity and respiratory and intestinal tracts. Decreasing amounts of sIgA are associated with the onset of upper respiratory tract infections [16]; therefore, IgA is considered an index of immune function. In this study, salivary samples were collected from the participants using a Salivette device 30 min or more after eating or drinking. Saliva samples were stored in a freezer and subsequently analyzed by the SRL Co. Ltd., Tokyo, Japan, kit utilizing a fully automated enzyme immunoassay (EIA) measuring device (POSEIDON II; Aloka Co., Tokyo, Japan).

2.3.2. Heart rate variability

The high frequency (HF) component of heart rate variability (HRV) increases after practice of AT, suggesting that AT is associated with an increase in cardiac parasympathetic tone [17]. Using three electrodes attached to the patient's chest, we recorded electrocardiograms (ECG) with an LRR-03 Memory Heart Rate Monitor (GMS, Tokyo, Japan), which also calculated HRV using the maximum entropy method for spectral analysis (MEM/Calc Tarawa, GMS Co, Tokyo, Japan). The area of spectral peaks within the range of 0.04–0.15 Hz represented low frequency (LF) power, and peaks within the 0.15–0.40 Hz range represented high frequency (HF) power. HF power is an index of parasympathetic nervous system activity.

2.4. Statistical analysis

Demographic and medical data were analyzed using the Student's *t*-test or chi-square (χ^2) test. The differences in sIgA levels between the groups were analyzed using Student's *t*-test. Paired *t*-test was used to determine whether changes in the HF component of HRV were significant at the pre- and post-test for each group. Analyses of the data were done with the SPSS software for Windows (version 18.0). All data were expressed as the mean ± standard deviation (SD). $p < 0.05$ was considered statistically significant.

3. Results

The study flow diagram is shown in Fig. 1. Fifty six women were assessed for eligibility, and 30 (53.6%) women with a breast cancer diagnosis were enrolled in this study. Salivary IgA could not be

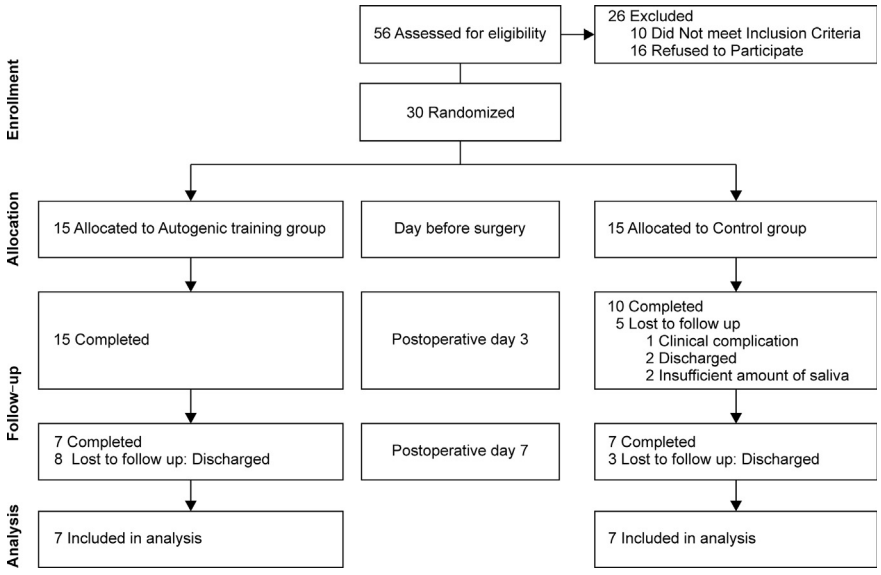

Fig. 1. Study flowchart.