Complementary Therapies in Clinical Practice 31 (2018) 126–131

Contents lists available at ScienceDirect

Complementary Therapies in Clinical Practice

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

Effect of hand and foot surface stroke massage on anxiety and vital signs in patients with acute coronary syndrome: A randomized clinical trial

Hasheminia Seyyed Alimohammad [a], Zahra Ghasemi [a, *], Salehi Shahriar [b], Sedehi Morteza [b], Khaledifar Arsalan [b]

[a] Community-Oriented Nursing Midwifery Research Center, Shahrekord University of Medical Sciences, Shahrekord, Iran
[b] Shahrekord University of Medical Sciences, Shahrekord, Iran

ARTICLE INFO

Article history:
Received 8 October 2017
Received in revised form
22 December 2017
Accepted 30 January 2018

ABSTRACT

Background and objectives: Anxiety affects various body systems, which leads to an increase in respiratory rate, heart rate, blood pressure, and myocardial oxygen demand. The aim of this study was to investigate the effect of hand and foot surface stroke massage on the level of anxiety and vital signs in patients with acute coronary syndrome (ACS).

Materials and methods: The single-blind clinical trial was performed on 70 patients with ACS. The patients were randomly assigned to the case and control groups. Anxiety levels were controlled 30 min before and 15 min after the intervention. The vital signs were checked in the two groups before, immediately after, 60 min, and 90 min after the intervention. The data were analyzed using SPSS software, descriptive statistics (mean ± standard deviation), independent *t*-test, paired *t*-test, and chi-square test.

Results: No significant difference was observed in the patients' levels of anxiety, systolic blood pressure, diastolic blood pressure, respiratory rate, and pulse rate before the intervention. However, after the intervention, the mean changes in the levels of anxiety, blood pressure, heart rate, and respiratory rate were significant.

Conclusion: Hand and foot massage can be a useful nursing intervention in attenuating anxiety levels and improving the vital signs in patients.

1. Introduction

Acute coronary syndrome (ACS) is an urgent condition that requires emergency intervention and occurs as a result of impaired coronary circulation; in the absence of timely actions, this syndrome can cause death. The American Heart Association reported that about 40.5% of the population has cardiovascular disease and 34% die from the disease each year [1]. Cardiovascular disease is the leading cause of death in the United States [1]. According to the Ministry of Health and Medical Education of Iran, the annual incidence rate of myocardial infarction in Iran is 64.9 per 100,000 people [2]. ACS and myocardial infarction are considered to be the main causes of hospitalization of patients in coronary care units (CCU). However, 50–70% of these patients experience anxiety attacks due to their fear of death [3,4].

Hospitalization creates anxiety among patients [5]. In care units, the unfamiliar environment, equipment, diagnostic procedures, clinical symptoms and pain, lack of social support, and unpredictability of the future can result in stress, anxiety, and hemodynamic instability in patients [4,6]. Stress and anxiety affect the nervous system by stimulating the sympathetic system, which increases the secretion of epinephrine and norepinephrine, and triggering the pituitary–hypothalamic axis, which increases the secretion of cortisol [7]. Subsequently, other organ systems, such as the cardiovascular, endocrine, pulmonary, and nervous systems, become involved and cause changes in consciousness, respiration, heart rate, blood pressure, and platelet aggregation [6,8–10]. Anxiety attacks stimulate the sympathetic system and, thus, cause a decrease in renal blood flow, which is followed by an increase in renin and angiotensin. Angiotensin leads to systemic

* Corresponding author.
E-mail address: st-ghasemi.z@skums.ac.ir (Z. Ghasemi).

https://doi.org/10.1016/j.ctcp.2018.01.012
1744-3881/

vasoconstriction, an increase in systemic blood pressure, and a decrease in systemic blood flow [11]. Anxiety also results in a high myocardial oxygen demand and an increased risk of cardiac dysfunction, dysrhythmia, ischemia, and death [3,12], as well as an increased incidence of myocardial infarction without angina in patients with cardiovascular disease [8].

Due to the negative effects of anxiety on the body, anxiety-relieving techniques are needed in CCUs. The current therapy given to attenuate anxiety in patients is medical treatments, such as sedative medications. However, because of the side effects of drugs, the use of complementary and alternative therapies is recommended to reduce anxiety in patients [3]. One of the most common and popular alternative therapies and an important part of nursing [13,28] is massage therapy, which is the scientific manipulation of soft tissues to relieve pain and anxiety in patients [13]. Studies have reported contradictory results about the effect of massage on vital signs. For example, Wang et al. found that hand and foot massage significantly reduced postoperative pain, but did not cause significant changes in blood pressure, respiratory rate (RR), or heart rate [14]. In 2006, Cambron et al. reported that massage increased diastolic blood pressure (DBP) and decreased systolic blood pressure (SBP) [15], while in 2015, Kanitz et al. stated that massage therapy had no significant effect on the level of salivary cortisol, a stress hormone, in patients [16]. Pinar et al. found that massage caused significant changes in cortisol levels ($p = 0.01$), blood pressure, and sleep quality in cancer patients [17]. Asadollahi et al. observed that massage had a significant effect on the level of cortisol in patients admitted to intensive care units [18]. Gholami et al. showed that stroke massage led to a significant decrease in SBP in healthy women, but did not affect the level of anxiety [19]. Kordi et al. stated that massage reduced pain and anxiety in patients because it triggered the secretion of endorphin, which had an analgesic effect [20,21]. Bahrami et al. showed that massage improved SBP in participants, but had no significant effect on DBP [22].

In this study, we aimed to evaluate the effect of hand and foot massage therapy on the level of anxiety and vital signs in patients with ACS. The whole body does not have to be bare for hand and foot massages, unlike whole body massages. These organs have many neural receptors [20]. Manual lymphatic drainage (MLD) leads to reduced recurrence of deep vein thrombosis [23]. To the best of our knowledge, there are no studies that have investigated the effect of hand and foot massage on anxiety and vital signs in patients with ACS.

2. Materials and methods

2.1. Study design

This randomized clinical trial was performed on 70 patients with ACS. These patients had been referred to Hajar Hospital in Shahrekord, Iran.

2.2. Data collection

Data were collected from July 6, 2017 to August 16, 2017 at Hajar Hospital, which is affiliated with Shahrekord University of Medical Sciences, Iran.

2.3. Inclusion criteria

Patients were over 18 years old, conscious, and had been diagnosed with ACS by a physician based on clinical symptoms, electrocardiogram (ECG) changes, and laboratory tests. They also did not have severe anxiety according to the physician, were not mentally impaired, had no history of taking warfarin due to the probability of bleeding, had a pulse rate (PR) > 60 beats per min and <110 beats per min, had no history of respiratory arrest in the last 72 h, did not have a pacemaker (due to hemodynamic instability), had no amputations, their DBP was not ≥110 mm Hg and their SBP was not ≥180 mm Hg, did not have cardiac arrhythmias, such as ventricular tachycardia or ventricular fibrillation, had no history of bone fractures in the previous 2 months, had not been diagnosed with a clotting disorder or deep vein thrombosis, had no dialysis fistula in the upper limb, did not take hypnotic drugs, opioids, benzodiazepines, or alcohol, and had received no spinal anesthesia in the last 4 h. The patients were willing to participate in the research, had healthy areas for massage (i.e., no red and swollen skin), and had no skin lesions or healing wounds [3,14,25,26].

2.4. Exclusion criteria

The exclusion criteria were that the participants were unwilling to cooperate in the research project and that they had obtained scores >65 for the Spielberger Anxiety Inventory. In this way, patients with severe and very severe anxiety were omitted from the study [34].

2.5. Subjects

The current study was conducted on 70 patients with ACS. The convenience sampling method was used to select study participants from individuals who met the inclusion criteria. The confidentiality of information, the importance of volunteering and cooperating during the study, and the study objectives were explained to each participant prior to the study. The research methodology, including the way of selecting participants, was also explained. Patients were given enough time to consult with their relatives to declare their intention to participate and cooperate in the study. The patients completed a written consent to participate in the research project.

Participants were randomly assigned to either the case group or the control group. Two envelopes, one for the case group and one for the control group, were used to randomize the participants in each group. The participants selected one of the two envelopes to determine which group they were in.

2.6. Sample size

The study sample size was determined to be 32.5 in each group according to the following equation:

$$n = \frac{\left(z_{1-\alpha} + z_{1-\beta}\right)^2 \left(s_1^2 + s_2^2\right)}{d^2}$$

where $S_1 = 5$, $d = 4$, $S_2 = 5$, $1 - \alpha = 0.95$, and $1 - \beta = 0.90$. Finally, 35 subjects were considered in each group by taking 10% attrition [21].

2.7. Procedures

Initially, patients in both groups provided their histories verbally. The Spielberger Anxiety Inventory was completed for the patients 30 min before the intervention; the vital signs of the patients were controlled and recorded in a checklist. A skin hypersensitivity test was performed on each patient's arm in the case group 30 min before the intervention. The patient was asked about a possible skin allergy to almond oil. In the absence of a skin allergy, the patient was placed on a bed in a supine position with a pillow under their feet. A massage was first performed on the hands from