

Case Study: Auricular acupressure relieves anxiety and fatigue, and reduces cortisol levels in post-caesarean section women: A single-blind, randomised controlled study

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Abstract:

Background

Anxiety and fatigue adversely affect women's postpartum recovery, but few effective non-pharmacological interventions are known to relieve these two common and unpleasant symptoms.

Objectives

To examine the efficacy of an auricular acupressure intervention provided during early postpartum in reducing anxiety, fatigue levels, cortisol levels, blood pressure, and heart rate.

Design

A single-blind, randomized controlled trial...

Participants

Women who underwent cesarean section were randomly allocated to two groups: intervention (auricular pressure, $n = 40$), and control (usual care, $n = 40$).

Methods

The intervention group received auricular acupressure on the shenmen acupoint twice a day (9 AM and 5 PM), and the

control group received usual postpartum care. Serum cortisol levels were assessed by immunochemiluminescence, with blood pressure and heart rate assessed by electric sphygmomanometer. Anxiety and fatigue symptoms were assessed using the State Anxiety subscale of the State-Trait Anxiety Inventory and the Fatigue Continuum Form, respectively.

Results

Of the 76 women who completed the study, those who received auricular acupressure had significantly lower mean cortisol levels (mean difference = 4 $\mu\text{g/dl}$, $p < 0.05$), heart rate (mean difference = 9.2 beats/min, $p < 0.001$), anxiety symptoms (mean difference = 3.8, $p < 0.01$), and fatigue symptoms (mean difference = 7.1, $p < 0.01$) than women in the control group at 5 days postpartum.

Conclusions

Auricular acupressure is an effective non-pharmacological method for reducing cortisol levels, heart rate, anxiety, and fatigue in early postpartum after cesarean section.

Keywords

Auricular, Acupressure, Cortisol, Anxiety, Fatigue, Caesarean section, Postpartum, Randomised, controlled, trial

Introduction:

What is already known about the topic:

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Auricular acupressure tends to be less invasive and much easier to use than acupuncture, particularly for mothers who need to take care of a newborn in the postpartum period...

What this paper adds:

In this randomized controlled trial, we found that early postpartum mothers who received auricular acupressure had significantly lower mean cortisol levels, heart rate, anxiety symptoms, and fatigue symptoms than women in the control group...

1. Introduction

Anxiety and fatigue are the most common distressing symptoms that adversely impact mothers' recovery (Ebnesahidi and Mohseni, 2008, Groër et al., 2005; Lai et al., 2015; Rychnovsky, 2007) and breastfeeding (Ebnesahidi and Mohseni, 2008, Groër et al., 2005, Lai et al., 2015, Rychnovsky, 2007) in the early postpartum period after both vaginal delivery and caesarean section (Ebnesahidi and Mohseni, 2008; Lai et al., 2015). Compared to women after vaginal delivery, post-caesarean section mothers often experience more anxiety symptoms (Andersen et al., 2012), higher

levels of depressive symptoms (Yang et al., 2011), more pain discomfort (Declercq et al., 2008), and are less likely to breastfeed in the first 3 months postpartum (Wiklund et al., 2007). Given the worldwide increase in the rate of caesarean section (Souza et al., 2010) and its great impact on maternal and neonatal health, it is clinically important to identify effective measures for relieving anxiety symptoms of post-caesarean section women.

Relieving these symptoms with pharmacological methods may affect postpartum recovery and breastfeeding (Ross et al., 2006). An alternative, non-pharmacological approach to relieving postpartum anxiety may be auricular acupressure, a noninvasive method that involves applying pressure to the auricle (outer ear). Indeed, auricular acupressure has been shown to reduce anxiety during ambulance transport before emergency hip surgery (Barker et al., 2006), improve sleep quality (Barker et al., 2006, Lo et al., 2013), and severity of hot flashes (Zhou et al., 2011). ...

For mothers undergoing caesarean section, early postpartum is a stressful and painful period characterised by elevated anxiety and fatigue because of the surgical process and surgical wound pain (Kuguoglu et al., 2012, Paul et al., 2013, Smith and Kroeger, 2010). Growing evidence suggests that postpartum women's anxiety, fatigue and depression are closely related (Kuo et al., 2014, Paul et al., 2013, Skouteris et al., 2009) and

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linked to adverse maternal physiological and psychological adjustment (Forster et al., 2008). Anxiety symptoms often activate the stress response, i.e. increased sympathetic nervous system activity (Spielberger, 2010) and decreased parasympathetic activity, which are linked to a variety of cardiovascular responses, including increased blood pressure and heart rate (Friedman, 2007). These changes may contribute to postpartum energy consumption as they have been suggested lead to more fatigue symptoms during labour (Tzeng et al., 2008). In addition, the co-occurrence of anxiety and fatigue may be due to dysregulation of the hypothalamic-pituitary-adrenal axis, notably by elevated cortisol levels (Brummelte and Galea, 2010)...

Increasing numbers of women have been adopting alternative therapies during their pregnancies because they are perceived as having fewer side effects than standard therapies and medications (Strouss et al., 2014) ...

Auricular acupressure tends to be less invasive and much easier to use than acupuncture, particularly for mothers who need to take care of a newborn in the postpartum period. Auricular acupressure involves applying pressure to an acupoint in the auricle (outer ear) so that a person's energy or *qi* can link to specific organs or body systems by channels or meridians (Oleson, 2013). The acupoint of the outer ear is called the shenmen acupoint, meaning a heavenly or spirit gate in Chinese. Applying

pressure to the shenmen acupoint has been shown to have a calming effect, promoting relaxation and sedation, as well as regulating and stabilising emotions (Frank and Soliman, 1999, Frank and Soliman, 2006).

For example, shenmen auricular acupuncture or acupressure decreased preoperative anxiety in patients undergoing elective ambulatory surgery (Wang et al., 2001), reduced the need for sedatives and anti-anxiety medications in postmenopausal women with anxiety (Kao et al., 2012), and alleviated anxiety in elderly patients before hip-fracture surgery (Barker et al., 2006)...

Since anxiety and fatigue symptoms are strongly correlated in women undergoing labour (Tzeng et al., 2008), we hypothesised that auricular acupressure would effectively reduce both anxiety and fatigue levels in early postpartum. To test this hypothesis, we examined the efficacy of an auricular acupressure intervention during early postpartum of post-caesarean section women in reducing anxiety, fatigue levels, cortisol levels, blood pressure, and heart rate.

Case Presentation:

2.1 Design

This single-centre, single-blind, randomised controlled study with parallel-group design was conducted in Taichung, Taiwan between January 2012 and May 2012...

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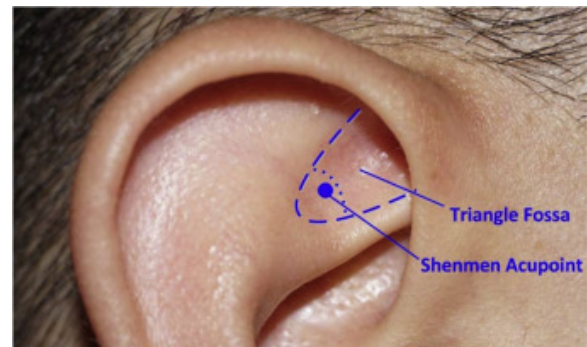
2.4 Intervention

The auricular acupressure protocol, including the frequency (Feng et al., 1994) and duration (Kao et al., 2012) of auricular acupressure, was developed based on prior research and consultations with two traditional Chinese medicine physicians and a traditional Chinese nursing specialist with >25 years clinical experience. Auricular acupressure was provided consistently by the second author (SHT) who had comprehensive training in auricular acupressure. The acupressure protocol included selecting the auricular shenmen acupoint, embedding and taping the vaccaria seed to the auricle, and applying acupressure twice a day according to schedule (see next paragraph).

Women in the acupressure group received auricular acupressure at the shenmen point located in the superior lateral wall of the triangular fossa (Fig. 1). The shenmen acupoint was located by forceps to confirm the position for embedding a 1.5-mm diameter vaccaria seed. After disinfecting each participant's auricles with 75% alcohol pads, one vaccaria seed was embedded on the shenmen point and secured by an adhesive tape. The seed remained in place during the study period. From postpartum day 1 to day 4, the second author (SHT) used her fingertip to apply

intermittent auricular acupressure to the shenmen point for 3 min twice daily (around 9 AM and 5 PM). "Intermittent acupressure" meant that pressure was applied every 0.5 s with a tolerable force level resulting in mild tingling and *qi* sensation (Hui et al., 2000, Kao et al., 2012). Given that mothers in the early postpartum period are often involved in various activities such as breastfeeding and resting, the frequency of auricular acupressure was only twice a day. In addition, to ensure consistency in the duration of acupressure (3 min), the same person (SHT) applied auricular acupressure to all participants.

Fig. 1



2.5 Control

Women in both the control and intervention groups received standard postpartum care offered at the hospital. Briefly, postpartum usual care included nursing assessment of vital signs, uterine fundus, abdominal incision, and postpartum nursing care.

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2.6 Outcome Measures

On postpartum days 1 and 5, data were collected on women's physiological outcomes (cortisol level, blood pressure, and heart rate) and psychological outcomes (fatigue and anxiety symptoms).

The primary outcome measure, cortisol level, was measured in participants' 8 AM blood specimens collected in BD tubes (Becton, Dickinson and Company, Franklin Lakes, NJ, USA) and assayed by immunochemiluminescence (Access Cortisol reagent, Beckman Coulter Inc., Chaska, MN, USA)..

Secondary outcomes included systolic and diastolic blood pressure, heart rate, fatigue symptoms, and anxiety symptoms. Blood pressure and heart rate were measured using an electric sphygmomanometer with participants in a seated position...

Results:

3.1 Participant Characteristics

Of the 80 participants recruited, 40 were randomly assigned to the auricular acupressure group and 40 to the control group...

3.2. Cortisol levels

On postpartum day 5, the mean cortisol level of the intervention group was significantly lower than that of the control group (mean difference = 4 µg/dl, $p < 0.05$). Within-group changes in cortisol

level differed significantly by intervention group...

3.4. Heart rate

The average heart rate of the intervention group decreased significantly from pretest to post-test ($p < 0.001$), while the average heart rate of the control group did not change significantly. After the intervention (post-test), the average heart rate of women in the auricular acupressure group was significantly lower than that of women in the control group...

3.5. Fatigue

Mean fatigue levels decreased significantly from pretest (postpartum day 1) to post-test (postpartum day 5) in both the intervention ($p < 0.001$) and control ($p < 0.05$) groups, but the mean fatigue score after the intervention was significantly lower in the intervention group than in the control group (mean difference = 7.1, $p < 0.01$). Overall, the change in within-group fatigue score differed significantly by group...

3.6. Anxiety symptoms

The mean anxiety level of the intervention group decreased significantly from pretest (postpartum day 1) to post-test (postpartum day 5) ($p < 0.05$), while the mean anxiety level of the control group increased significantly ($p < 0.01$). At post-test (postpartum day 5), the mean anxiety level of the intervention group was lower than that in the control group

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(mean difference = 3.8, $p < 0.01$). The interaction between time and group was significant for changes in anxiety level...

Discussion:

Our study, which is the first randomised controlled trial of the efficacy of auricular acupressure on anxiety and fatigue in mothers after caesarean section, used both subjective and biological measures of the effectiveness of auricular acupressure. Mothers who received 5 days of auricular acupressure at the shenmen acupoint experienced significantly fewer anxiety and fatigue symptoms at 5 days post-caesarean section than mothers who received usual postpartum care. Furthermore, the intervention effectively reduced cortisol levels and heart rate of post-caesarean section mothers during the early postpartum period...

Our finding that shenmen auricular acupressure effectively reduced both anxiety and fatigue symptoms after caesarean section is not likely to be explained by group differences in maternal or neonatal condition, as the acupressure and control groups did not differ significantly in indications for caesarean section and infants' condition at birth...Our findings are also similar to those demonstrating that auricular acupressure reduced anxiety symptoms in women undergoing in vitro fertilisation ([Qu et al., 2014](#)) or during peri- or early

menopause ([Kao et al., 2012](#)). These results are consistent with evidence that stimulating the ear shenmen acupoint has a sedative effect by regulating brain function and blood circulation based on the meridian theory of traditional Chinese medicine ([Frank and Soliman, 2006](#))...

We also found that auricular acupressure decreased fatigue symptoms of post-caesarean section women in early postpartum...

Our results show that after 5 days of shenmen auricular acupressure, post-caesarean section mothers' heart rate and cortisol levels were significantly reduced along with anxiety levels. Our findings on heart rate are consistent with previous reports that the heart rate of patients with chronic insomnia was significantly decreased after shenmen auricular acupressure ([Wang et al., 2013](#)), ...and tachycardia among patients who underwent coronary angiography was decreased by third eye and shenmen auricular acupressure ([Mansoorzadeh et al., 2014](#))...

Conclusion:

Our study is the first to show that shenmen auricular acupressure reduces early postpartum fatigue and anxiety of post-caesarean section women more than routine postpartum care. Our findings support the hypothesis that auricular acupressure effectively reduces both

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symptoms during early postpartum by revealing that auricular acupressure effectively reduced both subjective and objective indicators of anxiety and fatigue. Based on our findings on the positive effects of auricular acupressure, we recommend that caregivers consider applying this non-invasive method to deal with these two common and distressing symptoms, fatigue and anxiety in the early postpartum period.

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