



Research Article

Effect of Acupressure on Preoperative Cesarean Section Anxiety

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Abstract

Anxiety is a common preoperative problem in cesarean section candidates. Nonpharmacologic anxiety control has been demonstrated to be more suitable in pregnant women. The current study was a randomized, single-blind clinical trial which evaluated the effect of acupressure on preoperative C-section anxiety. In this study, 60 patients facing surgery were randomly divided into two groups of 30 patients each. Those patients in the intervention group received simultaneous acupressure at the Yintang and HE-7 acupoints for 5 minutes before surgery, and patients in the control group received intervention at a sham acupoint. The anxiety level of patients was preoperatively assessed twice using the Spielberger's State-Trait Anxiety Inventory. The mean anxiety scores of the two groups were shown to be insignificantly different before the intervention ($p = 0.859$), whereas a significant difference between the mean anxiety scores of the two groups was observed after the intervention ($p = 0.001$), suggesting that acupressure reduced the anxiety of patients before surgery.

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1. Introduction

Anxiety is one of the most common health problems and the second most important cause of disability worldwide [1]. By stimulating the sympathetic nervous system, anxiety causes tachycardia, increased blood pressure, arterial vessel contraction, decreased blood circulation to wounds, and decreased partial pressure of tissues [2].

Owing to the invasive nature of surgery, the majority of surgeries result in anxiety in patients [3]. According to the literature, preoperative anxiety occurs in 60–70% of adults. Available statistics indicate that 11–80% of adults undergoing various surgeries experience varying degrees of anxiety [4, 5].

In a study by Lopez, the most important reasons for preoperative anxiety were enumerated as fear of the hospital environment (35%), fear of surgery (33%), fear of anesthesia (45%), and unawareness of surgery (45%) [6]. Studies showed that surgical patients with high levels of preoperative anxiety repeatedly reported problems during the postoperative period and were susceptible to psychological reactions such as pain, which can increase the need for analgesics and anesthetics and, subsequently, length of stay in the hospital [7, 8]. One of the most common surgical procedures for women is a cesarean section, with 18.5 million C-sections being performed annually worldwide [9]. This number has increased significantly in the last two decades, especially in high-income countries [10].

Preoperative anxiety control and management, such as in C-section cases, are of the most important goals of nursing care around the world. Mothers need mental and physical relaxation following a C-section in order to take care of their babies. Therefore, postoperative tranquility for mothers requires planning prior to the C-section. One common way to control anxiety before surgery is by using sedatives, yet they are always associated with side-effects [11].

Therefore, the development of a noninvasive, low-cost, and uncomplicated method to reduce preoperative anxiety seems necessary. Preoperative anxiety control strategies are divided into two groups: pharmacological and non-pharmacological methods. The latter is preferred due to the fewer complications associated with it [12].

One nonpharmacological method is a technique known as acupressure, which is the practice of pushing acupuncture points using a sharp object or fingers, but without using needles [13]. Acupressure is a simple therapeutic approach applicable by nurses or even patients who have

The theory of acupressure states that there are 12 meridians in the body called energy channels. Diseases are believed to be caused by an unbalanced flow of vital energy in these meridians. By stimulating certain points in these meridians, vital energy flow is balanced in the body, and diseases are treated [16]. Moreover, acupressure can reduce anxiety by adjusting the concentration of neurotransmitters and decreasing the concentration of 5-hydroxytryptamine and adrenocorticotrophic hormones in the neurological pathway [17]. The most important points generally agreed to result in anxiety control in acupressure are the Yintang and HE-7 points [18, 19], which were used in this study. Despite numerous studies in this area, controversy still exists regarding the effect of acupressure on preoperative anxiety. In their meta-analysis, Bae et al. suggested that further studies be done in this field [18]. The present study evaluated the effects of acupressure on anxiety in patients preparing to undergo a C-section.

2. Materials and methods

2.1. Study participants

The present study was a single-blind randomized clinical trial conducted at the Vali-e-Asr Hospital of Fasa University of Medical Sciences in December 2017.

Inclusion criteria were absence of specific problems at the site of acupressure (no wounds, burns, cysts, and abscesses), no sedative, analgesic, or drug use that would affect preoperative anxiety, no history of mental problems, and no addiction or history of drug addiction or alcohol abuse. Exclusion criteria were the presence of an emergency condition, occurrence of a significant arrhythmia before surgery, spinal anesthesia, and being above 45 years of age.

2.2. Study design

A total of 60 women participated in the study, of whom 30 were in the intervention group and 30 in the control group. This sample size was calculated according to the study of Varaei et al. [20]. In this study, the clinical score difference before and after intervention was 7. A sample size of 27 was calculated for each group based on the following formula, which was ultimately increased to 30 to eliminate any uncertainty.

$$n = \frac{\left(z_{1-\frac{\alpha}{2}} + z_{1-\beta}\right)^2 \left(S_1^2 + S_2^2\right)}{\Delta^2} = \frac{(1.96 + 1.28)^2 \times (7.7^2 + 8.3^2)}{(7)^2} = \frac{10.5(59.25 + 68.89)}{49} = \frac{1345.7}{49} = 27$$

the necessary training as it is simple and requires no instruments [14]. Owing to the noninvasive and non-pharmacological nature of this method, the number of applicants interested in using acupressure to control and reduce the complications and symptoms of illnesses is increasing each day [15].

After obtaining approval from the Research Ethics Committee of Fasa University of Medical Sciences and before conducting the study, the details of the project were fully explained to all participants, and informed consent was obtained from each of them. Sample randomization was performed using the block

Table 1 Demographic data.

Demographic characteristics	Acupressure group		Placebo group	
Number of patients	30		30	
Age, mean ± SD [y]	28.26±4.51		28.66 ± 4.49	
Body mass index, mean ± SD [kg/m ²]	30.06±3.44		29.70 ± 3.61	
Gestational age, mean ± SD [WK]	38.26±0.86		38.00 ± 0.74	
Cesarean history	Nulliparas	6	Nulliparas	6
	Multiparas	24	Multiparas	24
Patient literacy	Pre-diploma	n = 10	Pre-diploma	n = 12
	Diploma	n = 14	Diploma	n = 10
	Post-diploma	n = 6	Post-diploma	n = 8

SD = standard deviation.

Two groups were homologized in age and previous cesarean history.

randomization method which consisted of 4-part blocks; in each block, two parts were in the control group and two were in the intervention group. Samples in both groups were matched in terms of age and history of C-section as well as other demographic information when possible (Table 1). Acupressure was performed by a trained individual under the supervision of an acupuncturist half an hour before the patient was transferred to the operating room (Fig. 1). Individuals in the control group were unaware (blinded) that acupressure was performed on a sham point.

2.3. Interventions

The points selected in this study were HE-7 and Yintang [21], which were simultaneously pressed with the thumb of the intervening person in the intervention group for 5 minutes [Fig. 2]. The right side of the body was selected for acupressure in all of the participants. In the control group, a sham point was pressed for 5 minutes.

2.4. Main outcome measures

Patients’ anxiety was measured by the Spielberger State-Trait Anxiety Inventory (STAI) in two steps. In both groups, the first was performed about 1 hour before the patient was transferred to the operating room, and the second immediately after the intervention. The standard STAI was introduced by Spielberger et al. in 1970. This inventory has been used repeatedly in various studies to measure anxiety and has a good validity and reliability [18]. In the study of Dehghan Nayeri et al., the reliability of the test was 94% [22].

The main purpose of the anxiety scale is to rate the intensity of anxiety from low to high. The questionnaire used in this study contained 20 short items. The lowest possible anxiety score was 20, indicating the absence of anxiety, and the maximum score was 80, indicating the highest anxiety level [19].

2.5. Statistical analysis

Normalization of the data was first measured using the Kolmogorov–Smirnov test, according to which all the data

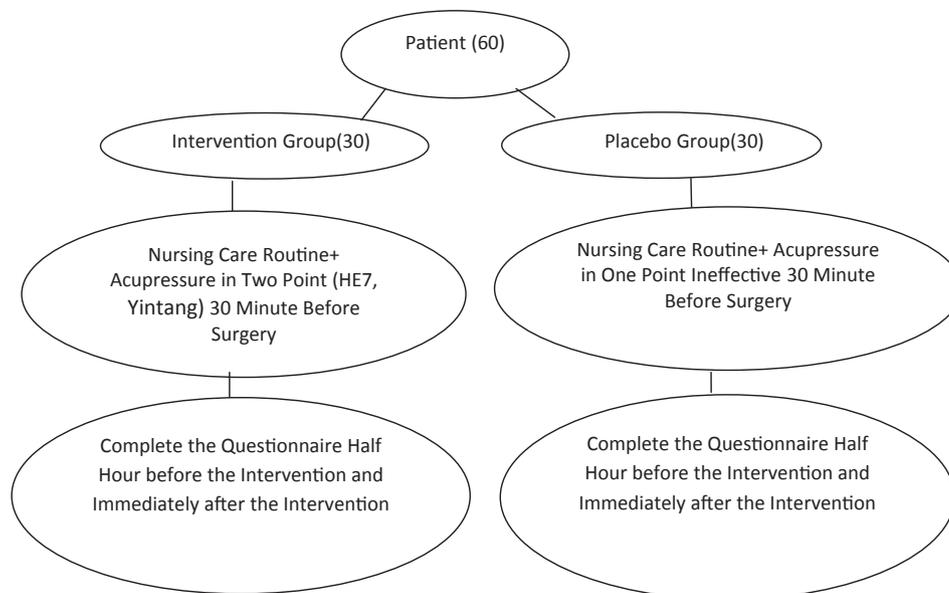


Figure 1 Diagram of materials and method.

Acupoint	Anatomical location		
Third eye[Yintang]	Between the two eyebrows		A
He-7 [Shenmen]	On the ulnar end of the transverse crease of the wrist, in the small depression between the pisiform and ulnar bones.		B
Placebo			C

Figure 2 The acupoints used in this study. Anatomic locations of the acupoints. (A) Third Eye (Yintang). (B) He-7 (Shenmen). (C) Placebo acupoint [21].

had a normal distribution. Then, paired *t* test was used to determine the effect of acupressure on patient anxiety before and after intervention in each group (Table 2). To compare the mean anxiety score in two groups before intervention, *t* test was used. It was also used to compare the mean anxiety score in two groups after intervention (Table 3). Finally, *p* < 0.05 was considered statistically significant.

3. Results

The total number of participants in the study was 60, of whom 30 were in the intervention group and 30 in the control group. Before assigning the samples in the intervention and control groups, they were matched in terms of age and history of previous C-section, so that each group comprised 18 and 12 women aged less and more than 30 years, respectively, and 6 nulliparas and 24 multiparas. Attempts were made to match other demographic variables as much as possible [Table 1]. Owing to the short time of the intervention, no samples were missed, and the patients cooperated well.

Comparison of the mean anxiety score before intervention showed no significant difference between the intervention (65.66 ± 8.08) and control (65.33 ± 6.29) groups (*p* = 0.859). However, a statistically significant difference existed between the intervention and control groups in terms of the mean anxiety score after the intervention (*p* = 0.001) (Table 3). In addition, the mean anxiety score in the intervention group was 65.66 ± 8.08 before intervention and 52.93 ± 3.50 after intervention (*p* = 0.001),

Table 2 Outcome measures of acupressure and placebo groups.

Groups	Time of intervention		<i>p</i> < 0.05
	Before intervention	After intervention	
Acupressure group [n=30]	65.66±8.08	52.93±3.50	=0.001
Placebo group [n=30]	65.33±6.29	67.46±5.55	=0.175

Data are presented as mean ± standard deviation. Each group was compared using paired *t* test for parametric data (first and second outcome).

Table 3 Outcome measures of acupressure versus placebo groups.

Anxiety score	Groups		<i>p</i> < 0.05
	Acupressure group [n=30]	Placebo group [n=30]	
Anxiety before intervention	65.66 ± 8.08	65.33 ± 6.29	=0.859
Anxiety after intervention	52.93 ± 3.50	67.46 ± 5.55	=0.001

Data are presented as mean ± standard deviation. Two groups were compared using *t* test for parametric data (first and second outcome).

while the results of this comparison in the control group were not statistically significant ($p = 0.175$) [Table 2].

Comparison of the mean anxiety score before intervention showed no significant difference between the intervention (65.66 ± 8.08) and control (65.33 ± 6.29) groups ($p = 0.859$). However, a statistically significant difference existed between the intervention and control groups in terms of the mean anxiety score after the intervention ($p = 0.001$) (Table 3). In addition, the mean anxiety score in the intervention group was 65.66 ± 8.08 before intervention and 52.93 ± 3.50 after intervention ($p = 0.001$), while the results of this comparison in the control group were not statistically significant ($p = 0.175$) [Table 2].

4. Discussion

Most women experience anxiety prior to undergoing a cesarean section. The feeling of anxiety can postpone the postoperative recovery process in mothers and affect both mother and infant. Therefore, preoperative anxiety control is very important and can reduce both surgery time and the harmful effects of anesthesia [23, 24]. There are various pharmacological methods for controlling preoperative anxiety, but nonpharmacologic methods are more important in pregnant women, in whom the passage of medicine from the placenta can endanger the fetus. Therefore, noninvasive and harmless methods are more suitable [25, 26]. In the present study, the effects of acupressure on preoperative anxiety were evaluated.

The results of this study showed that performing acupressure at the Yintang and HE-7 points significantly reduced preoperative anxiety. The results of the current study are consistent with those of Valiee et al. [3], despite minor differences in the study procedures. Valiee et al. used the Shenmen point in the ear, but in the present study, the Shenmen point in the patients' hands was used. In addition, the intervention time in the study of Valiee et al. was 10 minutes; in the present study, the intervention time was 5 minutes, as patients seemed to more easily tolerate shorter intervention times. In a study by Arami et al., the same two points were used to control anxiety before coronary angiography. In that study, the samples were divided into three groups of 45, including one control group and two groups of intervention with acupressure on the Yintang and HE-7 points for 5 minutes. In the present study, the results of which are consistent with those of Arami, the synergistic effects of these two points were evaluated [19]. A study conducted by Agarwal et al. included 76 patients and showed that acupressure is effective in reducing preoperative anxiety; however, its effects were not stable 30 minutes after the intervention. This result is consistent with the results of the current study, except that the stability of the treatment's effect on anxiety was not investigated in the present study [8]. In addition, the results of the present study are consistent with those of the meta-analysis of Hyojeong et al. In their study, 14 articles published through 2014 were evaluated, and the effects of acupuncture on preoperative anxiety were investigated and compared with the control group; Spielberger's Inventory and the visual analog scale (VAS) instrument were used in six and eight studies, respectively, and the results confirmed the positive

effects of acupuncture on reducing anxiety. However, they ultimately suggested that further studies are needed in this regard [27]. A study by Bansal et al. on the causes of anxiety before a C-section showed that the level of education and type of surgery (selective or emergency) influenced the severity of anxiety in patients before a C-section. Therefore, in the present study, emergency surgery was an exclusion criterion to eliminate the possibility of this factor affecting the results. In addition, patients in the two groups were matched in terms of education, i.e., high school diploma, under diploma, and above diploma (Table 1), to control the impact of education on data outcomes [28]. Eric et al. evaluated the risk factors of preoperative anxiety and showed that age, gender, and previous experience (in this case, unpleasant) increased the severity of preoperative anxiety. Therefore, in this study, the gender factor was controlled by investigating only C-section candidates as the target group. In addition, by matching the patients during sampling (nulliparity or multiparity; aged less than or more than 30 years), the effects of these confounding variables were also controlled [29].

The present study had several limitations, the first of which was the experience and expertise of the gynecologist. It seems that women's levels of anxiety vary with different surgeons. It is suggested that in future studies, the research samples be matched in terms of surgeons. The second limitation was the consumption of sedatives by women with high preoperative anxiety; in this study, women who received sedatives (2 patients) were excluded from the research. The third limitation was the insertion of a urinary catheter for patients before entering the operating room. Given the aggressive nature of this procedure, it could raise the patient's level of anxiety. Although this was beyond the control of the researcher, the procedure is performed routinely for all women; hence, it did not have an adverse effect on the research results. However, acupressure was performed after catheterization and when the patients had reached a level of tranquility. The fourth limitation was that patients were transferred to the operating room shortly after the intervention; thus, the duration of the intervention could not be measured. It is recommended that future studies evaluate the duration of the effects of intervention. It is also suggested that future studies compare the effects of acupressure with other therapies, such as medication methods and aromatherapy, and evaluate the impact of acupressure on other points that may affect anxiety, in other situations that lead to patient anxiety such as before endoscopy, and on anxiety susceptibility. Future studies should also investigate the effects of acupressure on variables such as less use of postoperative analgesics and anesthetics, shorter length of stay, and improved blood flow to the wound. A larger sample population should be selected in future studies in order to reduce the impact of confounding effects in research. Finally, it is suggested that researchers evaluate the effects of self-administered acupressure in future studies.

5. Conclusion

Based on the findings of this study, it can be concluded that the synergistic effect of acupressure in HE-7 and Yintang points can reduce preoperative anxiety and may have

a relaxing effect in women before C-section. Considering the effect of this method on decreasing anxiety before C-section, it can be used as a preoperative routine nursing care. In addition, patients can be trained to control preoperative anxiety through performing acupressure by themselves, because this technique is very easy and can be learnt simply.

Disclosure statement

The authors declare that there is no conflict of interest.

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