



## RESEARCH ARTICLE

### EFFECT OF ACUPRESSURE ON PREOPERATIVE CESAREAN SECTION ANXIETY

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#### ABSTRACT

**Background:** Control of preoperative anxiety especially before cesarean section, is one of the most important goals of nursing care around the world. **Aim of study :** To determine the effect of acupressure on preoperative cesarean section anxiety. **Methods:** Forty primiparae undergoing elective cesarean section surgery, were selected from El Galaa Teaching hospital, Cairo, Egypt , their age ranged from 20- 35 years, and BMI was less than 30 kg/m<sup>2</sup>. They were divided randomly into two groups equal in number, (group A) Study group, consisted of twenty women who received acupressure in two points (HE7 and Yintang) for 5 minutes each 30 minutes before surgery and (group B) control group, consisted of twenty women who received acupressure in two ineffective points (sham points) for 5 minutes each , 30 minutes before surgery. All women on both groups (A &B) were assessed pre and post treatment through assessing their vital signs: heart rate, and blood pressure to indicate the state of a patient's essential body functions Also, the State-Trait Anxiety Inventory (questionnaire) for measuring the circumstantial or temporary arousal of anxiety. **Results :** There was no statistical significant difference in heart rate between the pretreatment values compared to post treatment values in both groups (A&B) and there was no significant difference between both groups (A&B) when comparing heart rate post treatment values , while for systolic and diastolic blood pressure in group (A) there was a statistical significant decrease in post treatment values compared with pretreatment values, while there was no statistical significant difference between the pretreatment and post treatment values in group (B).When comparing the post treatment values of systolic and diastolic blood pressure of both groups there was a statistical significant decrease for favor of group (A) when compared to group (B), and for the State trait anxiety inventory questionnaire there was a statistical significant decrease between the pretreatment values compared to the post treatment values in both groups .When comparing the post treatment values of both groups there was a statistical significant decrease for favor of group (A) than group (B). **Conclusion:** Application of acupressure is effective in decreasing preoperative cesarean section anxiety.

#### INTRODUCTION

Anxiety is a normal and often healthy emotion. However, when a person regularly feels disproportionate levels of anxiety, it might become a medical disorder. Anxiety disorders form a category of mental health diagnoses that lead to excessive nervousness, fear, apprehension, and worry. These disorders alter how a person processes emotions and behave, also causing physical symptoms. Mild anxiety might be vague and unsettling, while severe anxiety may seriously affect day-to-day living [1]. Anxiety is one of the most common health problems and the second most important cause of disability worldwide [2].

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 [3]. Many studies reported that the high preference for caesarean section is associated with fear of childbirth. Nulliparous women experience more childbirth fear and the high antenatal fear is associated with emergency caesarean delivery [4]. 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[5,6]. Acupressure, the practice of applying finger pressure to specific acupoints throughout the body, was used in China as early as 2000 B.C. Acupressure is widely practiced both professionally and informally throughout

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Asia for relaxation, for the promotion of wellness and for the treatment of disease. These techniques are growing in popularity in North America and Europe [7]. Acupuncture and acupressure leads to improvement (living energy) through releasing nervous mediums like endorphins, encephalin, dopamine and serotonin in the central nervous system, which cause relaxation, since most patients get anxious due to needles, acupressure is a better substitute [8]. While pressure is put in the body it helps in removing the blocks, toxins, makes the blood flow smoothly and creates energy [9]. Owing to the noninvasive and nonpharmacological 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 [10]. This topic was chosen because it is a new field of knowledge that few researchers explore, after choosing my dissertation topic, I was quite literally given access to a very small and dark room which no one entered before.

## MATERIALS AND METHODS

Forty primiparae at the preoperative period of an elective cesarean section surgery, were recruited from El Galaa Teaching hospital, Cairo, Egypt, The practical part lasted for six months from May 2019 to November 2019, it was approved by research ethical committee of faculty of Physical Therapy, Cairo university in May 2019 NO : P.T.REC/012/002659. Were participated in this study to evaluate the effect of acupressure on the treatment of preoperative cesarean section anxiety.

**Inclusion criteria:** Primiparae women, their age ranged from 20 to 35 years, their BMI was less than 30 kg/m<sup>2</sup>, general anesthesia was used during surgery, type of cesarean section used was lower segment cesarean section.

**Exclusion criteria:** Any condition may affect usage of acupressure as specific problems at the site of acupressure (wounds, burns, cysts,.....), Significant arrhythmia before surgery, cardiovascular diseases, any sedatives or drugs used that would affect preoperative anxiety, history of mental problems, history of drug addiction or alcohol abuse.

**Subjects:** All women were randomly assigned into two groups equal in number, Group (A) (study group) (n=20) received acupressure in two points (HE7 and Yintang) for 5 minutes for each point, 30 minutes before surgery, and group (B) (control group) (n=20) received acupressure in two ineffective points (sham points) for 5 minutes for each point, 30 minutes before surgery. All participants read and signed informed consent form before initiation of the study.

## Procedures

### Assessment procedures

- J The physiotherapist conducted clinical assessment by recording personal data sheet, Weight and height measurements, Assessment of vital signs : (heart rate and blood pressure).
- J Assessment of patient anxiety intensity using (The Spielberger state-trait anxiety inventory (STAI) questionnaire form (y) which was performed two times for each patient, the first was about 1 hour before the

intervention, and the second was immediately after the intervention.

- J 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.

### Treatment procedures

- J Each participant in both groups (A&B) instructed about benefits of acupressure to gain her cooperation.
- J Patient position was long sitting with back and upper arms were supported, pillows and cushions were used under the knees and arms as well as cervical and lumbar curvature for body support and relaxation.
- J All participants were on quiet place with dim light to enhance relaxation
- J Body weight and height were measured for each participant.
- J Assessment of vital signs Pulse rate, and blood pressure for each participant in both groups (A&B) before treatment, the left arm was used for all participants.
- J Assessment of anxiety intensity using the spielberger state-trait anxiety inventory (STAI) questionnaire form (y) which was performed two times for each participant in both groups (A&B). the first one was about 1 hour before the intervention, and the second one was immediately after the intervention
- J The therapist was on the right side of the patient to apply acupressure.
- J Accupoints were pressed consecutively with the thumb of the therapist for 5 minutes each continuously 30 minutes before surgery.

**Group (A) (Study Group):** Consisted of twenty women who received Acupressure in two points (HE7 and Yintang). **He-7 (Shenmen) acupoint** is located On the ulnar end of the transverse crease of the wrist, in the small depression between the pisiform and ulnar bones (Figure 3) and **Yintang acupoint** is located between the two eyebrows. Acupressure was applied on two points **HE7** and **Yintang** which were pressed consecutively with the thumb of the therapist for 5 minutes each then release, this was done 30 minutes before surgery, the right side of the body was selected for acupressure in all of the participants.

**Group (B) (Control Group):** Consisted of twenty women who received acupressure in two ineffective points (sham points). Two Sham points were used, one on the external corner of the left eyebrow and the other one was located on the entrance of the cavity of the nonprevailing ear (located according wither person is right or left handed) Acupressure was applied on a sham point (placebo acupoint) which were pressed consecutively with the thumb of the therapist for 5 minutes each then release. This was done 30 minutes before surgery.

**Statistical analysis:** Results are expressed as mean  $\pm$  standard deviation, mean difference is calculated from the equation: -post-treatment - pre-treatment. Test of normality, Kolmogorov-Smirnov test, was used to measure the distribution of data measured pre-treatment, accordingly, comparison between normally distributed variables in the two groups was performed using unpaired t test.

**Table 1. Mean age, weight, height and BMI in the two studied groups (A&B)**

|                           | Group A (n= 20) | Group B (n= 20) | t value | P value    |
|---------------------------|-----------------|-----------------|---------|------------|
| Age (yrs.)                | 27.25 ± 3.91    | 28.85 ± 3.72    | -1.327  | 0.192 (NS) |
| Weight (kg.) <sup>2</sup> | 74.10 ± 3.24    | 73.25 ± 4.35    | 0.700   | 0.488 (NS) |
| Height (cm) <sup>2</sup>  | 161.40 ± 4.55   | 162.10 ± 5.40   | -0.444  | 0.660 (NS) |
| BMI (kg/m <sup>2</sup> )  | 28.47 ± 1.33    | 27.91 ± 1.67    | 1.180   | 0.246 (NS) |

Data are expressed as mean ± SD. NS= p> 0.05= not significant.

**Table 2. Comparison between mean values of HR in both groups (A&B) measured at pre- and post-treatment**

|                 | Group A (n= 20) | Group B (n= 20) | F value | P value    |
|-----------------|-----------------|-----------------|---------|------------|
| Pre-treatment   | 89.35 ± 7.92    | 86.45 ± 8.11    | 1.308   | 0.260 (NS) |
| Post-treatment  | 89.15 ± 8.05    | 86.50 ± 8.29    | 0.001   | 0.972 (NS) |
| Mean difference | 0.20            | 0.05            |         |            |
| % change        | 0.22            | 0.06            |         |            |
| p value         | 0.751 (NS)      | 0.964 (NS)      |         |            |

Data are expressed as mean ± SD. F value= ANCOVA test. NS= p> 0.05= not significant.

**Table 3. Comparison between mean values of systolic blood pressure in both groups (A&B) measured at pre- and post-treatment**

|                 | Group A(n=20)  | Group B (n= 20) | F value | P value   |
|-----------------|----------------|-----------------|---------|-----------|
| Pre-treatment   | 123.50 ± 11.37 | 118.50 ± 12.26  | 1.789   | 0.189(NS) |
| Post-treatment  | 111.75 ± 11.73 | 117.50 ± 11.87  | 21.116  | 0.001 (S) |
| Mean difference | 11.75          | 1.00            |         |           |
| % change        | 9.51           | 0.84            |         |           |
| p value         | 0.001 (S)      | 0.163 (NS)      |         |           |

Data are expressed as mean ± SD. F value= ANCOVA test. NS= p> 0.05= not significant. S= p< 0.05= significant.

**Table 4. Comparison between mean values of diastolic blood pressure in both groups (A&B) measured at pre- and post-treatment**

|                 | Group A (n= 20) | Group B (n= 20) | F value | P value    |
|-----------------|-----------------|-----------------|---------|------------|
| Pre-treatment   | 79.00 ± 10.21   | 73.50 ± 11.37   | 2.592   | 0.116 (NS) |
| Post-treatment  | 71.00 ± 8.83    | 72.75 ± 10.82   | 9.909   | 0.003 (S)  |
| Mean difference | 8.00            | 0.75            |         |            |
| % change        | 10.13           | 1.02            |         |            |
| p value         | 0.001 (S)       | 0.577 (NS)      |         |            |

Data are expressed as mean ± SD. F value= ANCOVA test. NS= p> 0.05= not significant. S= p< 0.05= significant

**Table(5): Comparison between values of self-evaluation questionnaire in both groups (A&B) measured at pre- and post-treatment**

|                       | Group A(n= 20) | Group B(n= 20) | Z <sup>#</sup> value | P value   |
|-----------------------|----------------|----------------|----------------------|-----------|
| Pre-treatment         | 54.60 ± 8.46   | 52.75 ± 4.99   | -1.058               | 0.290(NS) |
| Post-treatment        | 46.80 ± 8.65   | 49.80 ± 5.41   |                      | 0.207 NS) |
| Mean difference       | 7.80 ± 5.42    | 2.95 ± 2.98    | -3.360               | 0.001 (S) |
| % change              | 14.29          | 5.59           |                      |           |
| Z <sup>##</sup> value | -3.749         | -3.283         |                      |           |
| p value               | 0.001 (S)      | 0.001 (S)      |                      |           |

Data are expressed as mean ± SD. NS= p> 0.05= not significant. S= p< 0.05= significant. Z<sup>#</sup>= Mann Whitney test. Z<sup>##</sup>= Wilcoxon Sign Ranks test.

Analysis of covariance (ANCOVA) test was used to compare the pre-treatment values of the two groups and on the same time between post-treatment values on controlling the effect of pre-treatment value. Bonferroni correction test was used to compare within group (pre- vs post-treatment) differences. In not normally distributed data, comparison between variables in the two groups was performed using Mann Whitney test. While comparison between pre- and post-treatment data in the same group was performed using Wilcoxon Sign Ranks test. Statistical Package for Social Sciences (SPSS) computer program (version 19 windows) was used for data analysis. P value 0.05 was considered significant.

## RESULTS

**General characteristics of the participants in both groups (A & B):** The mean values (± SD) of age in groups A and B were 27.25 ± 3.91 yrs. and 28.85 ± 3.72 yrs., respectively.

There was no statistical significant difference between the two groups (t= -1.327, p= 0.192) (Table 1). The mean values (± SD) of weight in groups A and B were 74.10 ± 3.24 and 73.25 ± 4.35 kg., respectively. There was no statistical significant difference between the two groups (t= 0.700, p= 0.488) (Table1) The mean values (± SD) of height in groups A and B were 161.40 ± 4.55 and 162.10 ± 5.40 cm, respectively. There was no statistical significant difference between the two groups (t= -0.444, p= 0.660) (Table 1). The mean values (± SD) of BMI in groups A and B were 28.47 ± 1.33 and 27.91 ± 1.67 kg/m<sup>2</sup>, respectively. There was no statistical significant difference between the two groups (t= 1.180, p= 0.246) (Table 1)

**Within group comparison (intra group comparison) In Group (A),** there was no statistical significant difference between the mean value of HR measured at pre-treatment (89.35±7.92) and its corresponding value measured at post-treatment (89.15±8.05) with p value = 0.751.

**In group (B)**, there was **no statistical significant** difference between the mean value of HR measured at pre-treatment ( $86.45 \pm 8.11$ ) and its corresponding value measured at post-treatment ( $86.50 \pm 8.29$ ) with  $p$  value = 0.964

**Between groups comparison:** At pre-treatment, in groups (A & B), the mean values ( $\pm$  SD) of HR were  $89.35 \pm 7.92$  and  $86.45 \pm 8.11$ , respectively. There was no statistical significant difference between the two groups ( $F= 1.308$  &  $p= 0.260$ )

**Within group comparison (intra group comparison):** In Group (A), there was a statistical significant decrease in the mean value of systolic blood pressure measured at post-treatment ( $111.75 \pm 11.73$ ) when compared with its corresponding value measured at pre-treatment ( $123.50 \pm 11.37$ ) with  $p$  value = 0.001. In Group(B), there was no statistical significant difference between the mean value of systolic blood pressure measured at pre-treatment ( $118.50 \pm 12.26$ ) and its corresponding value measured at post-treatment ( $117.50 \pm 11.87$ ) with  $p$  value = 0.163.

**Between groups comparison:** At pre-treatment, in groups (A & B), the mean values ( $\pm$  SD) of mean systolic blood pressure were  $123.50 \pm 11.37$  and,  $118.50 \pm 12.26$  respectively. There was no statistical significant difference between the two groups ( $F= 1.789$  &  $p=0.189$ )

**Within group comparison (intra group comparison):** In group(A), there was a statistical significant decrease in the mean value of diastolic blood pressure measured at post-treatment ( $71.00 \pm 8.83$ ) when compared with its corresponding value measured at pre-treatment ( $79.00 \pm 10.21$ ) with  $p$  value = 0.001 In group (B), there was no statistical significant difference between the mean value of diastolic blood pressure measured at pre-treatment ( $73.50 \pm 11.37$ ) and its corresponding value measured at post-treatment ( $72.75 \pm 10.82$ ) with  $p$  value = 0.577

**Between groups comparison:** At pre-treatment, in groups (A & B), the mean values ( $\pm$  SD) of diastolic blood pressure were  $79.00 \pm 10.21$  and  $73.50 \pm 11.37$ , respectively. There was no statistical significant difference between the two groups ( $F= 2.592$  &  $p=0.116$ )

**Within group comparison (intra group comparison):** In Group(A), there was a statistical significant decrease in the value of self-evaluation questionnaire measured at post-treatment ( $46.80 \pm 8.65$ ) when compared with its corresponding value measured at pre-treatment ( $54.60 \pm 8.46$ ) with  $Z$  value= -3.749 and  $p$  value = 0.001

**In Group (B)**, there was a statistical significant decrease in the value of self-evaluation questionnaire measured at post-treatment ( $49.80 \pm 5.41$ ) when compared with its corresponding value measured at pre-treatment ( $52.75 \pm 4.99$ ) with  $Z$  value= -3.283 and  $p$  value = 0.001

**Between groups comparison:** At pre-treatment, in groups (A & B), the values ( $\pm$  SD) of self-evaluation questionnaire were  $54.60 \pm 8.46$  and  $52.75 \pm 4.99$ , respectively. There was no statistical significant difference between the two groups ( $Z= -1.058$  &  $p= 0.290$ ). To calculate the actual effect of physical therapy program, the mean difference in self-evaluation questionnaire was calculated. The mean values ( $\pm$  SD) of difference in self-evaluation questionnaire in both groups A and B were  $7.80 \pm 5.42$  and  $2.95 \pm 2.98$ , respectively. There was

a statistical significant decrease in its value in group A when compared with its corresponding value in group B ( $Z= -3.360$  &  $p= 0.001$ )

## DISCUSSION

Preoperative period is a stressful event that triggers specific emotional, cognitive, and physiological responses of a patient. Preoperative anxiety, is a common reaction experienced by patients who are admitted to a hospital for surgery. It can be described as an unpleasant state of tension or uneasiness that results from a patient's doubts or fears before an operation [11].

### The results of this study revealed that

**Study group (Group A):** There was no statistical significant difference between the mean value of HR measured at pre-treatment and its corresponding value measured at post-treatment with  $p$  value = 0.751. There was a statistical significant decrease in the mean value of both systolic and diastolic blood pressure which were measured at post-treatment when compared with its corresponding value measured at pre-treatment with  $p$  value = 0.001. Also, the Spielberger state-trait anxiety inventory (STAI) questionnaire, proved that there was a statistical significant decrease in the value of self-evaluation questionnaire measured at post-treatment when compared with its corresponding value measured at pre-treatment with  $Z$  value= -3.749 and  $p$  value = 0.001.

**Control group (group B):** There was no statistical significant difference between the mean value of heart rate (HR), systolic blood pressure and diastolic blood pressure measured at pre-treatment and its corresponding value measured at post-treatment with  $p$  value = 0.964,  $p$  value = 0.163,  $p$  value = 0.577 respectively. While the Spielberger state-trait anxiety inventory (STAI) questionnaire proved that there was a statistical significant decrease in the mean value of self-evaluation questionnaire measured at post-treatment when compared with its corresponding value measured at pre-treatment with  $Z$  value= -3.283 and  $p$  value = 0.001.

**Between groups comparison:** The results of HR revealed that there was no statistical significant difference between both groups (A & B) post treatment. ( $F= 0.001$  &  $p= 0.972$ ), while there was a statistical significant decrease in systolic blood pressure, diastolic blood pressure, and State-Trait Anxiety Inventory (questionnaire) for favor of group (A) when compared to group (B) post treatment. ( $F= 21.116$  &  $p= 0.001$ ), ( $F= 9.909$  &  $p= 0.003$ ), ( $Z= -3.360$  &  $p= 0.001$ ) respectively. The result of this study came in agreement with that of Abadi et al., (2018) who found that the synergistic effect of acupressure on HE-7 and Yin-tang points can reduce preoperative anxiety and may have a relaxing effect in women before C-section. Also, the result of the current study came in agreement with that of Arami et al., (2015) who examined the effect of acupressure points shenmen (HE7) with (yintang) acupoint on anxiety in patients undergoing coronary angiography, patients in study group received acupressure 30 minutes before angiography for 5 minutes in point's yintang and heart7 (shenmen) and those in control group received acupressure on false points near the thenar muscles. Anxiety of patients was measured one hour before and 10 minutes after the intervention by Spielberger's questionnaire.

The difference between intervention and control groups was significant ( $p=0.04$ ). Also the results of current study agreed with that of a study conducted by Agarwal et al.(2005), who investigated the effect of acupressure on pre-operative anxiety before elective surgery, patients in group 1 (control) received acupressure at an inappropriate site and group 2 (acupressure) received acupressure at Extra 1 point situated between the two eyebrows at the root of the nose. Anxiety was decreased significantly during acupressure application at extra 1 point ( $p < 0.001$ ). Anxiety was significantly reduced at the end of pressure application for 10 min in both the acupressure and control groups when compared to their respective baseline values. It was concluded that acupressure was effective in decreasing both pre-operative anxiety and bispectral index (BIS).

The results of the current study were consistent with those of Valiee et al. (2012) who investigated the effect of acupressure on preoperative anxiety before abdominal surgery and concluded that acupressure in true points was more effective and beneficial for preoperative anxiety than sham points, as the obtained results showed a statistically significant difference between the mean vital signs before and after intervention in the acupressure group. Also, it was concluded that acupuncture and acupressure cause neurotransmitters such as serotonin to be set free, which can have an impact on individuals' comfort. Armario et al., (2020) stated that the objective parameters, such as heart rate, blood pressure, respiratory rate, level of catecholamine, the cortisol level in the blood, and the skin temperature have a slight relationship with the mental changes as a result of acute anxiety before surgery. The weak relationship between reduction of anxiety and vital signs has always been a problem confronted by studies that looked at methods to reduce anxiety. So we can or can't see a change in the vital signs after performing acupressure and this explain the change in blood pressure without a change in the heart rate in the study group at the present study.

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