Effect of Electroacupuncture versus Paced Respiration on Post Menopausal Hot Flashes

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ABSTRACT

Background: This study was conducted to determine the effect of electro acupuncture versus paced respiration on post-menopausal hot flashes. **Subject Materials And Methods:** Thirty post-menopausal women suffering from hot flashes participated in this study. The participants were divided randomly into two groups equal in numbers (A and B); group A (n=15) received electro acupuncture on the acupuncture point for hot flashes for 15 minutes, 3 times/week for one month, group B (n=15) received relaxation technique in form of (paced respiration) for 15 minutes /sessions, 3 times/ week for one month Assessment of hot flashes in both groups was performed by using serum FSH level and hot flash questionnaire before and after the study. **The results showed that:** there was a statistically significant reduction in the post testing mean values of F.S.H in both experimental groups (A and B) compared with their pre testing one ($p < 0.05$) and this mean there was improvement of F.S.H in both groups. Moreover, there was significant difference in the mean values of F.S.H in favor of group (A) than group (B) ($p =0.002$). It can be concluded that four weeks of acupuncture and paced respiration were capable of improving serum FSH and can be used as intervention programs for menopausal hot flashes. In addition, patients with menopausal hot flashes may get additional benefit in improving their FSH level through acupuncture more than paced respiration.

Keywords: electro acupuncture, paced respiration, menopausal, hot flashes.

INTRODUCTION

Flat foot is one of the Vasomotor episodes with hot flashes and night sweating are the most prevalent complaints related to menopause. Other symptoms related to the menopause are disturbed sleep, anxiety and depression, reduced memory and concentration, urinary incontinence, and sexual problems. **(1).**

spontaneously within a few months. On the other hand, some women may experience long-lasting hot flashes that require clinical intervention **(2).**

Hormonal therapy (HT) including estrogens combined with progesterons or estrogens alone is the most effective treatment of hot flashes and sweating. Although HT is an effective treatment, some women are not recommended to use this treatment due to breast cancer or thromboembolic disease. HT seems to increase breast cell proliferation and therefore promotes breast cancer growth. Women on HT have increased risk of breast cancer compared with non-treated women **(3).**

Acupuncture has been suggested to be an alternative to HT, based on the fact that acupuncture increases central β-endorphin activity and therefore may make the thermoregulation more stable and decrease hot flashes and sweating. It was demonstrated that acupuncture significantly decreased the number of hot flashes after menopause and that the effect with electro-acupuncture persisted at least 3 months after the end of the treatment **(4)**.

Purpose of the study:

The aim of this study was to determine and compare the effect of electro acupuncture versus paced respiration on post-menopausal hot flashes.

MATERIALS AND METHODS

The current study was conducted on thirty post menopausal women suffering from hot flashes. They were selected from physiotherapy department at El Agoza police hospital, Cairo, Egypt.

Inclusion criteria:

The age of the participants ranged from 50-60 years. They were chosen as hot flashes suffers. Their body mass index (BMI) was from 25-28 kg/m2.

Exclusion criteria:

Women were excluded from this study if they had a history of breast cancer, myocardial infarction or pulmonary embolism. They were randomly assigned into 2 equal groups (A and B)

Group A:

This group consisted of 15 postmenopausal woman who received electro acupuncture on the acupuncture point for hot flashes for 15 minutes, 3 times/week for one month.

Group B:

This group consisted of 15 postmenopausal woman who received relaxation technique in form of (paced respiration) for 15 minutes /sessions, 3 times/ week for one month.

All subjects read and signed informed consent form before initiation of testing. The study was approved by research ethical committee of Faculty of Physical Therapy, Cairo University, in March 2016

Design of the study:

Pre and post experimental design

Materials:

a. Assessment materials

1) Data recording sheet:
2) Weight–height scale:
3) Patient reported hot flashes questionnaire:
4) Follicular stimulating hormone analysis:
5) Test tubes, syringes, cotton and alcohol:
6) ADVIA Centaur XPT system: (Bayer Corp, USA)

It was used to assess the level of FSH level.

A) Treatment materials :

1) Electro – acupuncture device:

It was used for application of electrical stimulation on the acupuncture points for group (A).

The device designed model was (phyaction 787), the chosen wave form was dynamic , the frequency was 100 HZ and the pulse duration was 0.5 ms**.**

Procedures:

A)Assessment procedures

1) History taking: Data recording sheet was given to each female at the starting of this study to collect personal data .
2) **Patient reported hot flashes questionnaire:** It was used to determine the level of hot flashes by post menopausal women. Each female was left for enough time to answer all the questions without interfering with her answers.
3) **Weight and height measurements:** The body weight and height were measured for each female. The weight-height scale was calibrated. Then, each female stood on the scale 2 times and the average of weight was taken. Then, each female stood with her back against the wall, her feet together and their heels, back, shoulders, and head all touching the wall. They were asked to tuck in their chin and look straight ahead then, the movable horizontal headboard was lowered until it rested gently on the top of the female's head and height was recorded. Weight and height were recorded to calculate BMI according to the following equation:

BMI = Weight/ Height squared (kg/m^2) (5).

4) **Blood analysis:** Woman was asked to lie in half lying position, with well

supported back and arms, the anticubital area were cleaned with alcohol. Blood sample of about 5cm will be drawn from the anticubital vein from all subjects by disposable sterile syringe by veinpuncture to determine the F.S.H hormone level which was done in the biochemistry department in El Agouza Police Hospital. This was done two times , before starting and after the end of the study. All sample was collected in the morning before breakfast for all cases.

B) Treatment procedures:

Group (A): Each patient in this group received electro acupuncture on the following acupuncture point for hot flashes for 15 minutes, 3 times/week for one month, **Table (1)**.

Group (A): Each patient in this group received electro acupuncture on the following acupuncture point for hot flashes for 15 minutes, 3 times/week for one month, **Table (1)**.

Table(1): Acupuncture points (6)

Point	Meridian	Location
SP4	Spleen	In the depression distal To or below the base of the first metatarsal bone, on the medial side of the foot.
SP6	Spleen	3cun above the medial malleolus,dorsal to the posterior border of the tibia.
He7	Heart	On the transverse crease of the wrist ,radial to the tendon of medial flexor carpi ulnaris.
L1 11	Large intestine	With elbow flexed at 90 degrees the point is on the anterolateral elbow joint in the mid point between the radial side of the skin crease of the elbow and lateral epicondyle humerous.
Liv2	Liver	Dorsum of foot in the fossa between the first and the second proximal phalanges and proximal to the margin of the toe web.
Ki6	Kidney	1cun directly below the tip of the medial malleolus.
Lu7	Lung	On the radial side of the forearm on the border of the radius,1.5 cun proximal to the tranveres crease of the wrist.
Pc6	Pericardium	Between the tendons of the Palmaris longus and flexor carpi radialis 2cun proximal to the transvers crease of the wrist.
GB34	Gall bladder	At the point of intersection of lines from anterior and inferior borders and head of fibula.
Liv3	Liver	Between the first and second metatarsal bones, 2cun proximal to the margin of the web.

N.B:A cun is relative body measure in traditional chines medicine, it is the distance between the transverse creases of the inter phalangeal bone of the thumb when the finger is slightly flexed **(6).**

Application of electroacuapuncture:

Skin was cleaned with an alcoholic swab, Sterile electrods were applied on the acupuncture points, the type of electrical current was (didynamic) with frequency (100 HZ) for (15 min), the intensity increased slowly and gradually up to a tolerable non painful pounding sensation level.

Application of paced respiration:

Patient sits in a quiet room in comfortable clothing if possible. She avoided lying down (in order not to fall asleep). She inhaled slowly and deeply through her nose for five seconds, then she exhaled slowly for five seconds. She was asked to focus on the air going in and out. When she inhaled, she breathed into the bottom part of her lungs (her upper lungs and chest filled up automatically). Her belly expanded as she breathed in and contracted as she breathed out when her mind wandered and distracting thoughts arised, she let them pass and returned her focus to her breath. Then she repeated for 15 minutes in the morning and 15 minutes in the afternoon, she also did the exercise whenever she felt a hot flash coming on.

Statistical analysis:

- Descriptive statistics and t-test were conducted for comparison of the mean age and BMI between both groups.
- T test was conducted for comparison of pre and post treatment mean values FSH between groups.
- Paired t test was conducted for comparison between pre and post treatment mean values of FSH in each group.
- The level of significance for all statistical tests was set at $p < 0.05$.
- All statistical measures were performed through the statistical package for social studies (SPSS) version 20 (SPSS, Inc., Chicage, IL).

RESULTS

The purpose of this study was to investigate the effect of bilateral flexible second degree flatfoot on weight bearing and non-weight bearing knee proprioception. sixteen subjects with bilateral flexible second degree flatfoot were compared with sixteen normal subjects.

Data obtained from both groups regarding weight bearing and non-weight bearing knee proprioception in form of repositioning error were statistically analyzed and compared.

General characteristics of the subjects:

Control group (group A):

Sixteen normal subjects were included in this group. Their mean ± SD age, weight, height, and BMI were 22.43 ± 1.75 years, 63.62 ± 9.54 kg, 173.21 ± 9.81 cm, and 22.75 ± 1.47 kg/m² respectively as shown in table (1) and figure (1-4).

Flatfoot group (group B):

Sixteen subjects with bilateral flexible second degree flatfoot were included in this group. Their mean ± SD age, weight, height, and BMI were 22.56 ± 2.06 years, 70.06 ± 9.65 kg, 168.82 ± 9.52 cm, and 23.25 ± 1.58 kg/m² respectively as shown in table (1) and figure (1-4).

Comparing the general characteristics of the subjects of both groups revealed that there was no significance difference between both groups in the mean age, weight, height, or BMI ($p > 0.05$).

Table 1. ***Descriptive statistics and t-test for comparing the mean age, weight, height and BMI of the control and flatfoot groups.***

	flatfoot group	Control group	MD	t-value	p-value
	$\overline{X}$ ±SD	$\overline{X}$ ±SD			
Age (years)	22.56 ± 2.06	22.43 ± 1.75	-.12	-.18	.85*
Weight (kg)	70.06 ± 9.65	63.62 ± 9.54	-6.43	-1.89	.06*
Height (cm)	168.82 ± 9.52	173.21 ± 9.81	-4.39	-1.51	.11*

The main purpose of this study was to investigate the effect of electroacupuncture versus paced respiration on post menopausal hot flashes of post.

Statistical analysis was conducted using SPSS for windows, version 20 (SPSS, Inc., Chicage, IL). The current test involved two independent variables. The first one was the (tested group); between subject factor which had two levels (group A receiving electroacuapunchure and group B receiving paced respiration). The second one was the (measuring periods); within subject factor which had two levels (pre treatment and post treatment). In addition, this test involved one tested dependent variable (FSH). Prior to final analysis, data were screened for normality assumption, homogeneity of variance, and presence of extreme scores. This exploration was done as a pre-requisite for parametric calculations of the analysis of difference.

Descriptive analysis using histograms with the normal distribution curve showed that the FSH was normally distributed and not violates the parametric assumption for the measured dependent variable. Additionally, testing for the homogeneity of covariance revealed that there was no significant difference with p values of > 0.05. the box and whiskers plots of the tested variable were done to detect the outliers. Normality test of data using Shapiro-Wilk test was used, that reflect the data was normally distributed for FSH. All these findings allowed the researchers to conduct parametric analysis. Accordingly, "paired t test" was used to compare between "pre" and "post" tests for each dependent variables for each group. "Unpaired t test" was conducted to compare dependent variables between both groups with the alpha level 0.05.

General characteristics of the subjects:

In this study, thirty post-menopausal were participated and distributed into two groups.

Group (A):

Fifteen post-menopausal women were included in this group. The data in table (2) and Fig. (16-19) represented their mean age (53.4±3.14) years, mean body mass (72.93±6.23) kilograms (kg), mean height (162.33±4.35) centimeters (cm), and mean BMI (27.63±1.51)(kg/m^2).

Group **(B):**

Fifteen post menopausal women were included in this group. The data in table (2) and (16-19) represented their mean age (54.6±3.48) years, mean body mass (73.2±5.5) Kilograms (kg), mean height (162.66±4.36) centimeters (cm), and mean BMI (27.64±1.36) (kg/m^2). As indicated by the independent t test, there were no significant differences (p>0.05) in the mean values of age, body mass, height, and BMI between both tested groups (Table 2).

Table(2): Mean values and standard deviations of physical characteristics of post-menopausal women in both groups.

Items	Group (A)		Group (B)		comparison		S
	Mean	±SD	Mean	±SD	t-value	p-value	
Age (years)	53.4	±3.24	54.6	±3.48	-0.976	0.337	NS
weight (Kg)	72.93	±6.23	73.2	±5.5	-0.209	0.836	NS
Height (cm)	162.33	±4.35	162.66	±4.36	-0.124	0.902	NS
BMI (kg/m^2)	27.63	±1.51	27.64	±1.36	-0.004	0.997	NS

*SD= standard deviation. P: probability, S: significance, NS: non=significant.

A. FSH level

1) **Within groups:** As presented in table (3) and illustrated in (Fig. 20-21), within group's comparison the mean ± SD values of FSH in the " pre" and "post" test were 59.75±8.51 and 40.38±8.75 respectively in the group A. paired t test revealed that there was highly significant reduction of FSH at post treatment in compare to pre treatment where their t and p-values were (t=6.669, p=0.0001*) and this mean there was improvement of FSH in group A and percent of change (improvement) was 32.4%. Additionally, the mean ± SD values of FSH in the "pre" and "post" tests were 56.88± 9.46 and 51.62±8.74 respectively in the group B. paired t test revealed that there was significant reduction of FSH at post treatment in compare to pre treatment where their t and p-values were (t=13.207, p=0.0001*) and this mean there was improvement of FSH in group B and percent of change (improvement) was 9.24%.
2) **Between groups:** Considering the effect of the tested group (first independent variable) on FSH, unpaired t test revealed that the mean values of the "pre" treatment between both, groups showed no significant differences where their t and p-values were (t=0.872, p=0.391). Additionally, unpaired t test revealed that there was significant difference of the mean values of the "post" treatment between both groups where their t and p-values were (t=-3.517, p=0.002*) and this significant reduction in favor of group A than group B.

Table(3): Mean ± SD and p values of FSH pre and post test at both groups.

Serum FSH level	Pre test	Post test	MD	% of change	t-value	p-value
	Mean ± SD	Mean ± SD				
Group (A)	59.75 ±8.51	40.38±8.75	19.36	32.4↓	6.669	0.0001* (HS)
Group (B)	56.88±9.46	51.62±8.74	5.26	9.24↓	13.207	0.0001*(HS)
MD	2.86	-11.23				
t-value	0.872	-3.517				
p-value	0.391 (NS)	0.002* (HS)				

SD: standard deviation MD: Mean difference, S: significance, NS: nonsignificant. HS: highly significant

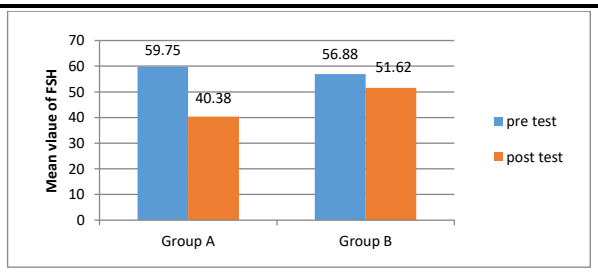

Fig (1): Mean value of FSH level for both groups(A and B) at pre and post-treatment.

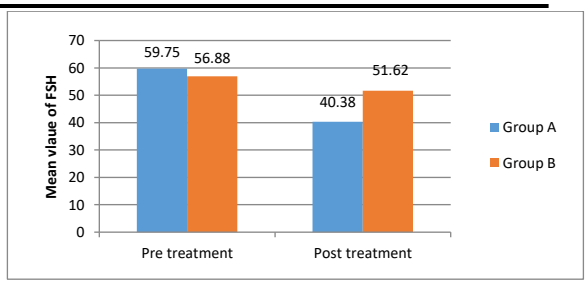

Fig (2): Mean values of FSH level for both groups(A and B) pre and post-treatment.

2. Non parametric tests

A. Sweet of hot flushes during the day:

1) **Within groups:** As presented in table (4) and illustrated in figure (22), within groups comparison the median (interquartile range) of the sweet of hot flushes during the day in the "1st week","2nd week" , "3rd week" and "4th week" were 16 (19), 13(27), 9(13) and 14(15) respectively for the group A. "Friedman test" revealed that there was no significant difference of sweet of hot flushes during the day in this group (X^2= 3.93, P-value =0.269). Wilcoxon Signed Rank tests (Post hoc tests) revealed that there was a significant difference in the sweet of hot flushes during the day between (1st week Vs. 3rd week) with (Z= -2.167, p = 0.03*) and this significant improvement in favour to 3rd week in compared to 1st week. While there was no significant difference among "1st week Vs. 2nd week", "1st week Vs. 4th week", "2nd week Vs. 3rd week", "2nd week Vs. 4th week" and "3rd week Vs. 4th week" with (Z= -0.245, p = 0.807), (Z= -0.503, p = 0.615), (Z= -1.476, p = 0.14), (Z= -0.377, p = 0.706) and (Z= -1.251, p = 0.211) respectively.

While the median (interquartile range) of the sweet of hot flushes during the day in the "1st week","2nd week", "3rd week" and "4th week" were 16 (15), 14 (8), 14 (15) and 12 (14) respectively for the group B. "Friedman test" revealed that there was significant difference of sweet of hot flushes during the day in this group (X^2= 9.146, P-value =0.027*). Wilcoxon Signed Rank tests (Post hoc tests) revealed that there was a significant difference in the sweet of hot flushes during the day between (1st week Vs. 2nd week) with (Z= -2.147, p = 0.032*) and this significant improvement in favour to 2nd week in compared to 1st week. While there was no significant difference among "1st week Vs. 3rd week", "1st week Vs. 4th week", "2nd week Vs. 3rd week", "2nd week Vs. 4th week" and "3rd week Vs. 4th week" with (Z= -1.51, p = 0.131), (Z= -1.855, p = 0.064), (Z= -1.081, p = 0.28), (Z= -0.63, p = 0.529)

and (Z= -1.507, p = 0.132) respectively.

Among groups: Considering the effect of the tested group (first independent variable) on the sweet of hot flushes during the day, " Mann-Whitney U tests " revealed that there was no significant difference of sweet of hot flushes during the day between both groups in the "1st week","2nd week" and "4th week" with (Z= -0.291, p = 0.775), (Z= -0.146, p = 0.902) and (Z= -0.374, p = 0.713) respectively. While, there was significant difference of sweet of hot flushes during the day between both groups in "3rd week" with (Z= -2.277, p = 0.023*) and this significant improvement in favour to group A in compared to group B.

Table(4): Descriptive statistics and Non-parametric tests of sweet of hot flushes during the day in patients with Median (interquartile range (IQR)) at different measuring periods at different groups.

Median (interquartile range (IQR))	1st week	2nd week	3rd week	4th week
Group A	16 (19)	13(27)	9(13)	14(15)
Group B	16(15)	14(8)	14(15)	12(14)

Friedman test for sweet of hot flushes during the day		
	Group A	Group B
X2-value	3.93	9.146
p-value	0.269	0.027*

Wilcoxon Signed Rank tests (within groups)				
	Group A		Group B	
	Z-value	p-value	Z-value	p-value
1st week Vs. 2nd week	-0.245	0.807	-2.147	0.032*
1st week Vs. 3rd week	-2.167	0.03*	-1.51	0.131
1st week Vs. 4th week	-0.503	0.615	-1.855	0.064
2nd week Vs. 3rd week	-1.476	0.14	-1.081	0.28
2nd week Vs. 4th week	-0.377	0.706	-0.63	0.529
3rd week Vs. 4th week	-1.251	0.211	-1.507	0.132

Mann-Whitney tests (between groups)								
	1st week		2nd week		3rd week		4th week	
	Z-value	p-value	Z-value	p-value	Z-value	p-value	Z-value	p-value
Group A Vs. group B	-0.291	0.775	-0.146	0.902	-2.277	0.023*	-0.374	0.713

***Significant level is set at alpha level <0.05**

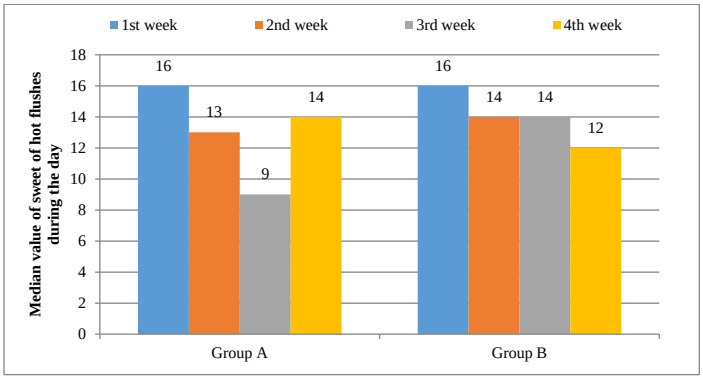

Fig (3): The median value of sweet of hot flushes during the day between both groups at different measuring periods.

B. Sweet of hot flushes during the last night:

1) **Within groups:** As presented in table (5) and illustrated in figure (23), within groups comparison the median (interquartile range) of the sweet of hot flushes during the last night in the "1st week","2nd week" , "3rd week" and "4th week" were 24 (11), 21(17), 17(12) and 23(13) respectively for the group A.

"Friedman test" revealed that there was no significant difference of sweet of hot flushes during the last night in this group (X^2= 6.203, P-value =0.102). Wilcoxon Signed Rank tests (Post hoc tests) revealed that there was a significant difference in the sweet of hot flushes during the last night between (1st week Vs. 3rd week) with (Z= -2.17, p = 0.03*) and this significant improvement in favour to 3rd week in compared to 1st week. While there was no significant difference among "1st week Vs. 2nd week", "1st week Vs. 4th week", "2nd week Vs. 3rd week", "2nd week Vs. 4th week" and "3rd week Vs. 4th week" with (Z= -0.967, p = 0.334), (Z= -1.307, p = 0.191), (Z= -1.364, p = 0.173), (Z= -1.278, p = 0.201) and (Z= -1.65, p = 0.099) respectively.

While the median (interquartile range) of the sweet of hot flushes during the last night in the "1st week","2nd week", "3rd week" and "4th week" were 27 (14), 28 (14), 26 (12) and 25 (11) respectively for the group B. "Friedman test" revealed that there was no significant difference of sweet of hot flushes during the last night in this group (X^2= 3.694, P-value =0.296). Wilcoxon Signed Rank tests (Post hoc tests) revealed that there was a significant difference in the sweet of hot flushes during the last night between (1st week Vs. 2nd week) with (Z= -2.363, p = 0.018*) and this significant improvement in favour to 1st week in compared to 2nd week. While there was no significant difference among "1st week Vs. 3rd week", "1st week Vs. 4th week", "2nd week Vs. 3rd week", "2nd week Vs. 4th week" and "3rd week Vs. 4th week" with (Z= -0.944, p = 0.345), (Z= -1.251, p = 0.211), (Z= -0.199, p = 0.842), (Z= -0.346, p = 0.73) and (Z= -1.99, p = 0.842) respectively.

Among groups:

Considering the effect of the tested group (first independent variable) on the sweet of hot flushes during the last night, " **Mann-Whitney U** tests " revealed that there was no significant difference of sweet of hot flushes during the last night between both groups in the "1st week","2nd week" and "4th week" with (Z= -1.019, p = 0.325), (Z= -0.561, p = 0.595) and (Z= -1.432, p = 0.161) respectively. While, there was significant difference of sweet of hot flushes during the last night between both groups in "3rd week" with (Z= -2.392, p = 0.016*) and this significant improvement in favour to group A in compared to group B.

Table(5): Descriptive statistics and Non-parametric tests of sweet of hot flushes during the last night in patients with Median (interquartile range (IQR)) at different measuring periods at different groups.

Median (interquartile range (IQR))	1st week	2nd week	3rd week	4th week
Group A	24 (11)	21(17)	17(12)	23(13)
Group B	27(14)	28(14)	26(12)	25(11)

Friedman test for sweet of hot flushes during the last night		
	Group A	Group B
X2-value	6.203	3.694
p-value	0.102	0.296

Wilcoxon Signed Rank tests (within groups)				
	Group A		Group B	
	Z-value	p-value	Z-value	p-value
1st week Vs. 2nd week	-0.967	0.334	-2.363	0.018*
1st week Vs. 3rd week	-2.17	0.03*	-0.944	0.345
1st week Vs. 4th week	-1.307	0.191	-1.251	0.211
2nd week Vs. 3rd week	-1.364	0.173	-0.199	0.842
2nd week Vs. 4th week	-1.278	0.201	-0.346	0.73
3rd week Vs. 4th week	-1.65	0.099	-1.99	0.842

Mann-Whitney tests (between groups)								
	1st week		2nd week		3rd week		4th week	
	Z-value	p-value	Z-value	p-value	Z-value	p-value	Z-value	p-value
Group A Vs. group B	-1.019	0.325	-0.561	0.595	-2.392	0.016*	-1.432	0.161

*Significant level is set at alpha level <0.05

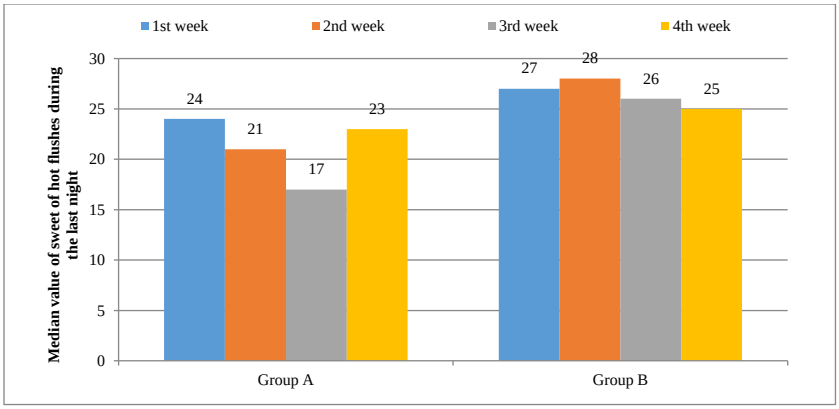

Fig (4): The median value of sweet of hot flushes during the last night between both groups at different measuring periods.

DISCUSSION

Menopause is the permanent cessation of menstruation resulting in the loss of ovarian follicle development. Menopause is defined retrospectively as the time of the final menstrual period, followed by 12 months of amenorrhea. Post-menopause describes the period following the final menses (**7).**

Menopausal symptoms include vasomotor symptoms, urogenital atrophy, osteoporosis, cardiovascular disease, cancer, psychiatric symptoms, cognitive decline, and sexual problems. Many symptoms are found related to post menopausal syndrome as hot flashes, irritability, mood swings, insomnia, dry vagina, difficulty concentrating, mental confusion, stress incontinence, urge incontinence, osteoporotic symptoms, depression, headache, vasomotor symptoms and insomnia **(8).**

Hot flashes are most prevalent complaints experienced by women around the world during the transition to and through menopause. In the United States, hot flashes are one of the main reasons women at menopause seek medical help or look for dietary supplements and over-the-counter remedies for relief **(1).**

Hormonal therapy (HT) is the most effective treatment for hot flashes and sweating. Although HT is an effective treatment, women on HT have increased risk of breast cancer, endometrial cancer, coronary heart disease, and stroke. As a result, there has been widespread interest in identifying non-pharmacologic treatments that are not only effective, but safe and well-tolerated **(9).**

However, only limited data for optimum non- pharmacologic treatments for hot flashes were available. Therefore, the current study was conducted to compare effect of

the electroacuapuncture versus paced respiration on hot flashes in post menopausal women.

The current study was conducted on thirty females. They were randomly assigned into two groups equal in number; group A (n=15) received electro acupuncture on the acupuncture point for hot flashes for 15 minutes, 3 times/week for one month, group B (n=15) received relaxation technique in form of (paced respiration) for 15 minutes /sessions, 3 times/ week for one month**.**

The findings of the current study revealed significant reduction in the post testing mean values of F.S.H in both experimental groups (A and B) compared with their pre testing one ($p < 0.05$) and this mean there was improvement of F.S.H in both groups. Moreover, there was significant difference in the mean values of F.S.H in favor of group (A) than group (B) ($p < 0.05$).

These results can be explained by the fact that acupuncture increases central β-endorphin activity, substance P and serotonin and according to their theory thereby stabilize the thermoregulatory centre in the hypothalamus and may make the thermoregulation more stable and decrease hot flashes and sweating **(10, 4).**

One possible explanation for the effect of acupuncture on hot flashes is that acupuncture could modulate endogenous opioids, thus restoring endorphin concentrations in the central nervous system. The excretion of the calcitonin gene-related peptide (CGRP), a potent vasodilator, is regulated by endogenous opioids, so the changes in endogenous opioid levels achieved by acupuncture might affect the release of CGRP. CGRP is a potent vasodilator and stimulator of cholinergic sweat glands, and has been suggested as a mediator of hot flashes and sweating in post menopausal women **(11)**.

Paced respiration also significantly decreases menopausal hot flashes through slowing the resting respiratory rate and prolonging expiration, reduces sympathetic activity **(12).**

It was reported by **Col et al**. **(13)** that paced respiration decreases autonomic responsiveness and central sympathetic activity. Thus, based on the current understanding of the pathophysiology of hot flashes, which involves increased central sympathetic activity, paced breathing seems to be biologically plausible for improving hot flashes.

From all the above, It is easy to interpret the improvement of F.S.H which was obtained in the current study in both study groups (A and B) and indicated the ability of acupuncture and paced respiration to improve post menopausal hot flashes.

Regarding the effect of electro

acupuncture on hot flashes, previous acupuncture trials in menopausal women, as well as survivors of breast cancer, reported an at least 50% decrease in hot flashes **(9).**

Kim et al. (9) reported that the acupuncture showed a significant improvement in the number, severity, and overall score of hot flashes and menopause-related symptoms compared with the usual care group after 12 sessions of treatment for 4 weeks.

The findings of the current study are also in agreement with **Innes et al. (2010)**, who reported that acupuncture significantly decreased the number of hot flashes after menopause and that the effect with electro-acupuncture persisted at least 3 months after the end of the treatment.

Our study is resonant with a recently published pragmatic trial, the Acupuncture on Hot Flashes among Menopausal Women (ACUFLASH) trial. In both trials, acupuncture successfully decreased hot flashes and improved quality of life in post menopausal women **(11)**.

Moreover, **Avis et al. (14)** published results from their pragmatic, open-labeled trial, in which the acupuncture group reported a 37% improvement in hot flashes and the waitlist control group a 6% worsening of hot flashes.

Regarding the effect of paced respiration on hot flashes, the findings of the current study are in agreement with that of **Heinicke et al. (15),** who reported that applied relaxation is another alternative to HT and significantly decreased menopausal hot flashes after 12 weeks of treatment**.**

Also, a large-scale study conducted by **Carpenter et al. (16)** supported the findings of the current study. They found that using breathing exercises to relax can relieve hot flashes—sometimes the frequency, sometimes the intensity, sometimes both. “In three of his studies, slow, controlled deep breathing cut the frequency of hot flashes by about half.”

Moreover, when paced respiration was practiced twice daily, 30 minutes, it could reduce physiologically recorded and self reported hot flashes than control group **(16)**.

Freedman and colleagues were the only investigators to demonstrate paced respiration as the active ingredient of relaxation-based interventions. They started by comparing progressive muscle relaxation plus paced respiration (n= 7) to attention control (n = 7) among healthy midlife women. This treatment reduced diary-recorded hot fl ashes after 6 weeks with continued effects at 6 months **(17).**

Regarding the significant difference in the mean values of F.S.H in favor

of group (A) than group (B), this is the first study to compare acupuncture with paced respiration but this can be explained by:

First, expectations may play a role in this difference. A recent pooled analysis of four RCTs of acupuncture treatment for chronic pain involving a total of 864 patients showed that patients with higher expectations were more likely to report better outcomes for the primary endpoint compared with patients with lower expectations. Epidemiological and neuroimaging research has also suggested the positive impact of expectancy and belief for acupuncture treatment **(18).**

Apart from treatment efficacy, patient preferences and values should be considered in treatment decisions. Women may identify positively with the philosophies of Chinese medicine, may prefer acupuncture, or may already be using it to successfully treat other conditions.

Second, **Burns & Carpenter (17)** protocol requires an average minimum of 30 minutes of paced respiration each day for practice alone (15 minutes twice a day). Additional time is required to apply the breathing with each hot flash. The more frequent a woman's hot flashes, the more time each day would be required. Perhaps the 15 minutes, 3 times/week were not enough to induce a massive improvement in the group that used paced respiration.

Limitations

Although, the current study presents objective data with statistically significant differences, there are some limitations.

- The females' mood changes. Seasonal variations and atmosphere.

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