The effect of acupressure on anxiety and dysrhythmia in patients undergoing cardiac catheterization

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Abstract: One of the ways to diagnose heart diseases is catheterization that most often causes stress and anxiety in patients. Acupressure is one of the effective non-pharmacological interventions to reduce patients' anxiety. The present study was aimed at investigating the effect of acupressure on the level of anxiety in patients undergoing coronary angiography. **Method:** The study was a double-blind clinical trial in which 70 patients who had referred to Kashan's Shahid Beheshti Hospital and undergone coronary angiography were studied. The participants were randomly assigned to an acupressure group and a pseudo points group. For the experimental group, acupressure was applied in correct third eye and shenmen points while the control group patients received acupressure in 1.5 cm away from the main points. Anxiety was measured through VAS anxiety questionnaire (0-10) and the dysrhythmia through a checklist. In the both groups, VAS anxiety and dysrhythmia in angiography blade were measured right away after the participants entered the angiography ward and before they were injected medication in three phases. Data analysis was carried out through independent t-test, paired t-test, covariance analysis, and chi square test. **Results:** There was a significant difference between the level of VAS anxiety of angiography blade and its level immediately after the patients entered the angiography ward and before they were injected medication ($p<0.001$). However, there was no significant difference between the two groups regarding dysrhythmia (angiography blade and immediately after entering the angiography ward, $p=0.2$) and (angiography blade and before injecting medication, $p=0.6$). **Discussion and Conclusion:** Acupressure had positive effect on reduction of anxiety and tachycardia. Therefore, acupressure can be utilized before conducting critical procedures.

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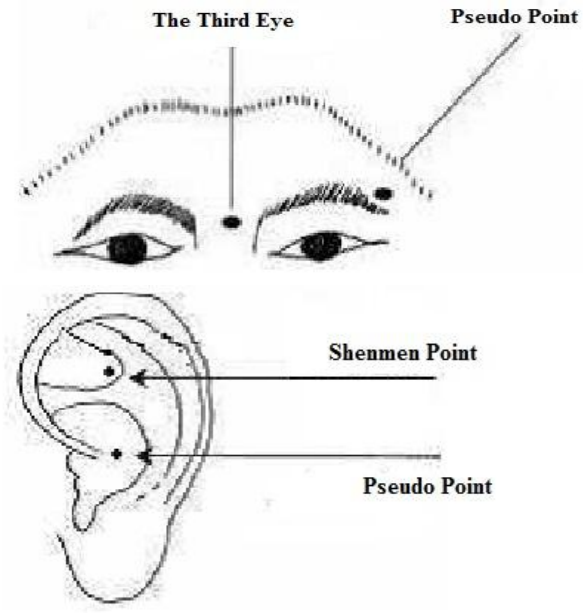
Introduction

Coronary artery disease is one of the causes of death.[1] Cardiac catheterization is a procedure that is used to ensure about detection of coronary artery disease.[2] In the United States, about 2 million heart patients undergo cardiac catheterization every year, and this number is increasing because this diagnosis method is valid and accurate[3], which like other critical procedures causes stress and anxiety in patients.[4] Studies conducted on the level of anxiety before angiography show that over 82% of patients undergoing these procedures experience fear and anxiety due to conducting this procedure and the results of their disease diagnosis.[5] Anxiety before and after cardiovascular interventions can raise myocardial oxygen demand and lead to irregularities in heart rhythm and pain due to the reduced blood flow to the heart muscle. Moreover, unfavorable physiological effects on cardiovascular system delay recovery and enhance complications of cardiovascular interventions.[6] Pharmacological and non-pharmacological methods are utilized to control anxiety. One of the most common pharmacological methods is using benzodiazepines that have a transient effect and are associated with some side effects; therefore, in recent years different research studies have been conducted on non-pharmacological methods. One of these non- pharmacological interventions is modification of anxiety through complementary medicine.[7] In advanced countries, applying complementary medicine is increasing. A study conducted in Iran also showed that 80% of

patients were interested in receiving complementary medicine by doctors.[8] Acupressure that is adopted from acupuncture is one of these methods, in which the same points as in acupuncture are pressured by the fingers of the palm.[9] According to Chinese belief, acupuncture leads to improvement (living energy) through releasing nervous mediums like endorphins, encephalin, dopamine and serotonin in the central nervous system, which cause relaxation.[10] Using this method is increasing because it is cheap and does not need specialized tools. It is also an effective, quick, safe, and non-critical technique[11] that is easy to learn and apply, and nurses have the chance to utilize it. Moreover, since most patients get anxious due to needles, acupressure is a better substitute. Different studies have been conducted on acupressure like its decreasing effect on nausea caused by chemotherapy[13], decreasing childbirth pain[14], sleep quality[15], blood pressure reduction[16], intensity and duration of dysmenorrhea[17], etc. In their study, Kober *et al* concluded that acupressure could effectively influence patients' anxiety while transferring them to hospital[24]. In another similar study conducted by Fasoulakia *et al*, the results showed that acupressure significantly reduced anxiety and stress ($p<0.001$)[18]. The results of the study conducted by Wang indicated that applying acupuncture in the ear led to a significant anxiety reduction in individuals who had undergone outpatient surgery[19]. In Agarwal's study, preoperative anxiety in placebo group patients decreased significantly immediately after applying acupressure in pseudo points[20]. Taking the abovementioned information in mind on the one hand and ease of using acupressure by nurses, other health caretakers, and even the patients themselves on the other hand, the researcher intended to investigate the effect of acupressure and its effect duration on the level of anxiety and dysrhythmia in patients before angiography.

Method

The present study is a clinical trial. The participants of the study were patients who underwent coronary angiography in Kashan's Shahid Beheshti Hospital and had characteristics determined by the researcher. Sample size was 70 patients who were randomly divided into an experimental group and a control one. Data were collected through a questionnaire of demographic characteristics, VAS anxiety questionnaire (0-10) that has been frequently used in different studies [18, 20, 21] and has necessary reliability and validity, and a checklist to register dysrhythmia including non-hazardous dysrhythmia (sinus tachycardia and sinus bradycardia) and hazardous dysrhythmia (occurrence of premature atrial contractions, premature ventricular contractions, and ventricular tachycardia). Before the intervention, the level of measured anxiety and heart dysrhythmia was monitored and registered by the researcher for 2 minutes. Afterwards, acupressure was administered in the both groups. To administer acupressure in the experimental group, the researcher first put the plastic bead[22] on shemen point and non-dominant ear and pressed those areas with fingers for 10 minutes (See Figure 1). At the same time, the researcher pressed the third eye point with the thumb using rotary moves with an average 20-25 times per minute for 10 minutes (See Figure 2). In the control group, acupressure was applied in pseudo points including outer corner of the left eyebrow and the beginning of the non-dominant ear cavity. VAS anxiety and dysrhythmia were checked and registered in 3 phases including angiography blade ward, immediately after the patients entered the angiography ward, and before injecting medication. Data were analyzed through independent t-test, paired t-test, covariance analysis, and chi square test using SPSS 16.0. The study was confirmed by the research and moral committees of Kashan University of Medical Sciences and registered in Iran's center of clinical trials.



Results

Mean age in the experimental group was 55.36±7.30 and in the control group was 54.90±7.07. The two groups were homogenous regarding demographic variables (See Table 1). The results of the study showed that the mean VAS anxiety in the experimental group changed from 5.82±1.68 to 4.28±1.44 immediately after they entered the angiography ward and in the control group it changed

from 5.00±1.13 to 4.8±1.18. The difference between the two groups was significant (p=0.001). The mean VAS anxiety in the experimental group changed from 5.82±1.82 to 3.71±1.46 before injecting medication and in the control group it changed from 5.00±1.13 to 4.51±1.61. The observed difference between the two groups was significant (p=0.001). The results of the study also indicated that in the experimental group there was a significant difference between VAS anxiety (angiography blade and immediately after the patients entered the angiography ward) and (angiography blade and before injecting medication) (p=0.001).

However, in the control group there was no significant difference between VAS anxiety (angiography blade and immediately after the patients entered the angiography ward) (p=0.33) and (angiography blade and before injecting medication) (p=0.9) (See Table 2). Moreover, the results of the study showed that there was no significant difference between the two groups in regard with their dysrhythmia immediately after they entered the angiography ward (p=0.2) and before injecting medication (p=0.6).

Table 1. Demographic characteristics of the participants

Demographic Characteristics		Experimental		Control		P
		N	%	N	%	
Sex	Male	17	6.48	19	3.5	63
	Female	18	4.51	16	7.45	
Education	Illiterate	14	0.4	15	9.42	96
	Under Diploma	18	4.51	17	6.48	
	Diploma and more	3	6.8	3	5.8	
Mental Disease	Yes	11	4.31	5	3.14	8
	No	24	6.68	30	7.85	
Drug	Yes	7	0.2	7	0.2	17
	No	28	0.8	27	0.8	
Etiology	Pain	19	3.54	14	0.4	34
	Positive Exercise Test	10	6.28	8	9.22	
	Pain Repetition	2	7.5	4	4.11	
	PTCA	1	9.2	5	3.14	
	Other	3	5.8	4	4.11	
Drugs Before Catheterization	Heart Medication	23	7.65	21	0.6	80
	Respiration Medication	0	0.0	1	9.2	
	Diabetes Medication	3	6.8	3	6.8	
	Blood Pressure Medication	1	9.2	3	6.8	
	Other	2	7.5	1	9.2	
	Diabetes, Blood Pressure and Heart	2	7.5	1	9.2	
	Non	4	4.11	5	1.14	
Total		35	100	35	100	

Table 2. Comparing the level of VAS anxiety of angiography blade and immediately after entering the angiography ward and before injecting medication in the two groups

Group / Measuring Time	True Point Acupressure		Pseudo Point Acupressure Group		
VAS Anxiety	Mean	SD	Mean	SD	P
Angiography Blade	5.82	1.68	5.00	1.13	
Immediately after entering the angiography ward	4.28	1.44	4.80	1.18	0.001*
Before injecting medication	3.71	1.46	4.51	1.61	0.001**

Table 3. Comparing heat dysrhythmia of angiography blade and immediately after entering the angiography ward and before injecting medication in the two groups

Group / Measuring Time		True Point Acupressure Group		Pseudo Point Acupressure Group		
Arrhythmia		N	%	N	%	P
Angiography Blade	Without Arrhythmia	9	28.1%	24	68.6%	
	Non-hazardous	21	65.6%	11	31.4%	
	Hazardous	2	6.3%	0	.0%	
Immediately after entering the angiography ward	Without Arrhythmia	19	55.9%	25	71.4%	
	Non-hazardous	13	38.2%	10	28.6%	0.2*
	Hazardous	2	5.9%	0	.0%	
Before injecting medication	Without Arrhythmia	21	61.8%	٣٠	85.7%	
	Non-hazardous	12	35.3%	٥	14.3%	0.6**
	Hazardous	1	2.9%	0	0%	

Discussion

In the present study, the level of anxiety immediately after the patients entered the angiography ward and before injecting medication significantly decreased in the experimental group, which is in line with the results of studies conducted by Fassoulakia on healthy volunteers[18], Tokumaro on electric activities of healthy individuals' stomach muscles[23], Kober while transferring patients to the hospital[24], Agarwal on patients who volunteered to perform surgery[20], and Valiee in patients before abdominal surgery[22]. Therefore, the Chinese belief that acupressure improves living energy through releasing nervous mediums like endorphins, encephalin, dopamine and serotonin in the central nervous system, which cause relaxation. In addition, Hinze states that presence of the nurse beside the patients leads to their relaxation and encouragement[25] and reduce the patients' anxiety. However, in all conducted studies, it has been concluded that the effect of acupressure in short run lasts, which was concluded to decrease in the present study. It should also be noted that mere presence of the nurse beside the patient and his/her communication with them can decrease their anxiety, which is confirmed through reduction of anxiety in the control group in the present study. The level of dysrhythmia in the patients under cardiac catheterization who received acupressure in true points did not decrease significantly. However, in the experimental patients, this method was effective on sinus tachycardia, which shows the main effect of acupressure on sympathetic nerves. And the fact that there was no significant difference between the two groups in regard with occurrence of sinus bradycardia, ventricular tachycardia, premature ventricular contraction, atrial premature contraction, and cardiac arrest, which is due to complex mechanism involved with occurrence of dysrhythmia.

Conclusion

The results of the present study show that the level of anxiety in the patients awaiting angiography was high and its level in the patients receiving true acupressure reduced more compared to those who were provided with pseudo acupressure. This finding proves the hypothesis of the study, and in the experimental group this method was effective on sinus tachycardia. Therefore, according to the positive effects of acupressure on anxiety reduction, it is recommended that this non-critical and non-pharmacological method that does not have any proved side effects and patients feel relaxed with should be utilized to deal with patients' anxiety reduction and be taught to nurses.

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