TURKISH JOURNAL OF CARDIOVASCULAR NURSING

Official journal of the TURKISH SOCIETY OF CARDIOLOGY

Turkish Journal of Cardiovascular Nursing

How Important is Acupressure Application in Balancing Heart Rate and Blood Pressure in the Treatment of Atrial Fibrillation? Randomized Controlled Study

Atriyal Fibrilasyon Tedavisinde Kalp Hızı ve Kan Basıncının Dengelenmesinde Akupresür Uygulaması Ne Kadar Önemli? Randomize Kontrollü Çalışma

ORIGINAL ARTICLE

ABSTRACT

Objective: Atrial fibrillation (AF) is a significant cause of morbidity and mortality due to complications such as elevated heart rate, embolism risk, and arrhythmia. This study aimed to assess the effect of acupressure on blood pressure and heart rate in patients diagnosed with chronic atrial fibrillation.

Methods: This randomized, placebo-controlled experimental study included 69 participants divided into three groups of 23 individuals, determined through power analysis. The research was conducted between February 20, 2018, and July 20, 2018. No interventions were applied to the control group before or after measurements. In the placebo group, an acupressure wristband was loosely placed in an inverted position on the Shenmen points (HT7) of the wrist, with no pressure applied. In the intervention group, acupressure wristbands were correctly positioned on both wrists to apply pressure to the Shenmen (HT7) points, and acupressure was administered. The intervention was conducted twice on the same day, at 9:00 AM and 3:00 PM.

Results: Comparison between the groups revealed no significant differences in blood pressure or heart rate following acupressure application in the experimental group ($p > 0.05$).

Conclusion: Acupressure applied to patients with chronic AF has no measurable effect on blood pressure or heart rate. Further studies involving larger groups are recommended.

Keywords: Acupressure, atrial fibrillation, blood pressure, heart rate

ÖZ

Amaç: Atriyal fibrilasyon yüksek kalp hızı, emboli riski ve aritmi gibi komplikasyonları nedeniyle ciddi morbidite ve mortalite nedenidir. Bu çalışmada kronik atriyal fibrilasyon tanısı alan hastalarda akupresürün kan basıncı ve kalp hızı üzerine etkisinin belirlenmesi amaçlanmıştır.

Yöntem: Randomize, plasebo kontrollü deneysel çalışma, güç analizi ile belirlenen 23 kişilik 3 grupta toplam 69 kişi ile gerçekleştirildi. Araştırma 20.02.2018 – 20.07.2018 tarihleri arasında gerçekleştirilmiştir. Kontrol grubuna ölçümlerden önce ve sonra herhangi bir işlem yapılmadı. Plasebo grubunda ise Shenmen noktalarına (HT7) gevşek ve ters pozisyonda yerleştirilen akupresür bilekliği ile bileğin herhangi bir noktasına baskı uygulanmadı. Müdahale grubundaki hastaların Shenmen (HT7) noktasına baskı yapacak şekilde her iki kola doğru pozisyonda akupresür bilekliği yerleştirildi ve akupresür uygulandı. Akupresür aynı gün saat 09.00 ve 15.00 olmak üzere iki kez uygulandı.

Bulgular: Gruplar arası karşılaştırmada deney grubunda akupresür uygulaması sonrası kan basıncı ve kalp atım hızında anlamlı farklılık saptanmadı ($P > 0,05$).

Sonuç: Kronik AF'li hastalara uygulanan akupresürün kan basıncı ve kalp hızı üzerine etkisi yoktur. Daha büyük gruplarda farklı çalışmaların yapılması önerilebilir.

Anahtar Kelimeler: Akupunktur, atriyal fibrilasyon, kan basıncı, kalp hızı

Introduction

Atrial fibrillation (AF) is the most common type of cardiac arrhythmia.[1,2] According to 2008 data from Türkiye, the prevalence of AF is 1.26%, with an incidence rate of

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Received: December 13, 2023
Accepted: August 15, 2024

Cite this article as: Soylu A, Korkmaz M. How important is acupressure application in balancing heart rate and blood pressure in the treatment of atrial fibrillation? randomized controlled study. *Turk J Cardiovasc Nurs* 2025; 16(39):21-30.

DOI: 10.5543/khd.2024.96658

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1.35 per thousand. AF prevalence increases with age; while it occurs in 0.5% of the population under 40 years old, this rate rises to 5% in individuals over 65 and exceeds 10% in those in their 80s.[3] The Framingham study, ongoing since 1949, has also confirmed that AF prevalence increases with aging, supporting these predictions.[4] Additionally, it has been reported that the average age of AF diagnosis is between 75 and 85 years.[5] AF is observed twice as often in males as in females.[4,6]

Every 20 mmHg increase in systolic blood pressure raises the risk of atrial fibrillation (AF) by 21%.[7] Systolic blood pressure levels ≥140 mmHg and within the range of 128–138 mmHg have also been linked to AF.[8] A study conducted in Türkiye found that 34% of patients with high blood pressure had AF.[9] Similarly, another study reported that 25% of individuals with high blood pressure were diagnosed with AF.[10] Additionally, it has been noted that 60–80% of patients with chronic AF have high blood pressure.[11]

AF significantly reduces quality of life, causing symptoms such as chest pain, shortness of breath, palpitations, fatigue, listlessness, insomnia, and activity intolerance. It can also result in stroke and long-term complications.[12]

There are three main goals in the treatment of atrial fibrillation (AF): controlling heart rate, preventing the risk of embolism, and treating the arrhythmia.[13] Effective AF treatment should be both safe and cost-effective. The literature highlights supportive studies demonstrating that AF treatment can meet these criteria, being reliable, cost-effective, and easy to implement.[12-15]

One such method is acupressure. Acupressure, often described as non-invasive acupuncture, is a treatment technique involving the application of physical pressure to specific points on the body using fingers, the hand, the palm, a wristband, or an acustimulation device.[15,16] It aims to balance the body's disrupted energy through energy channels. While acupuncture's effects are well-documented, acupressure remains less widely known. However, improper application, not adhering to guiding principles, may lead to adverse outcomes.[17]

Acupressure is recognized in the Nursing Interventions Classification (NIC)[18] and is included in the nursing practices guide in Türkiye.[17] In a study investigating the effects of acupressure on cardiac rhythm and heart rate in patients with atrial fibrillation (AF), Ceyhan et al.[12] found that acupressure reduced heart rate in AF patients, and repeated applications were effective in lowering both systolic and diastolic blood pressure. Similarly, Biçer et al.[19] reported that acupressure helped balance blood pressure in patients. In another study, Biçer et al.[20] noted that acupuncture applied to the Neiguan (PC6) point regulated blood pressure in individuals with essential hypertension.

As a non-invasive method, acupressure can be easily and effectively implemented in nursing care with appropriate training.[12,20,21] However, there are limited studies conducted by nurses on this subject, highlighting the need for more evidence-based research. Therefore, the aim of this study is to evaluate the effect of acupressure applied to the Shenmen (HT7) heart point on blood pressure and heart rate in patients with chronic atrial fibrillation (AF).

MAIN POINTS

- Atrial fibrillation (AF) is a common cardiac arrhythmia.
- It is a cause of serious morbidity and mortality due to complications such as high heart rate, embolism risk and arrhythmia.
- Only placebo effect of acupressure in the treatment of atrial fibrillation (AF) was found
- The effect of acupressure on AF could not be determined.

Study Hypotheses

- **H_{01}:** Acupressure applied to individuals with atrial fibrillation (AF) will have no effect on systolic blood pressure (SBP).
- **H_{02}:** Acupressure applied to individuals with AF will have no effect on diastolic blood pressure (DBP).
- **H_{03}:** Acupressure applied to individuals with AF will have no effect on heart rate.
- **H_{11}:** Acupressure applied to individuals with AF will have an effect on systolic blood pressure.
- **H_{12}:** Acupressure applied to individuals with AF will have an effect on diastolic blood pressure.
- **H_{13}:** Acupressure applied to individuals with AF will have an effect on heart rate.

Methods

Study Design and Patient Selection

This study was designed as a pre-test-post-test, placebo-controlled, randomized, parallel-controlled experimental study. The research was conducted between February 20, 2018, and July 20, 2018, with patients assigned to groups in parallel.

Patients eligible for inclusion were over 18 years old, diagnosed with chronic atrial fibrillation (AF), fully conscious, oriented, and cooperative, with a heart rate between 70 and 120 bpm, and no recent history of open-heart surgery. Exclusion criteria included a diagnosis of renal failure (which can impair heart rhythm and structure), liver failure (which can affect hemodynamic balance), or hyperthyroidism (which increases pulse rate).

Sample Selection

The sample size was determined using a t-test with G*Power v3.1.2 software. The calculation was based on the systolic blood pressure measurement taken 30 minutes after acupressure application in the study by Lin et al.[22] According to the power analysis, a total of 69 patients (23 in each group: experimental = 23, control = 23, placebo = 23) were required to achieve 80% power, with d=0.8549798d = 0.8549798 and α=0.05\alpha = 0.05. Initially, 81 patients meeting the inclusion criteria were randomized into the study (control = 26, placebo = 28, experimental = 27). However, during the study, 3 patients from the control group, 5 from the placebo group, and 4 from the experimental group were excluded due to their inability to complete the study. The study was ultimately completed with 69 patients distributed as follows: experimental group = 23, control grouP = 23, placebo grouP = 23 (Figure 1, CONSORT diagram).

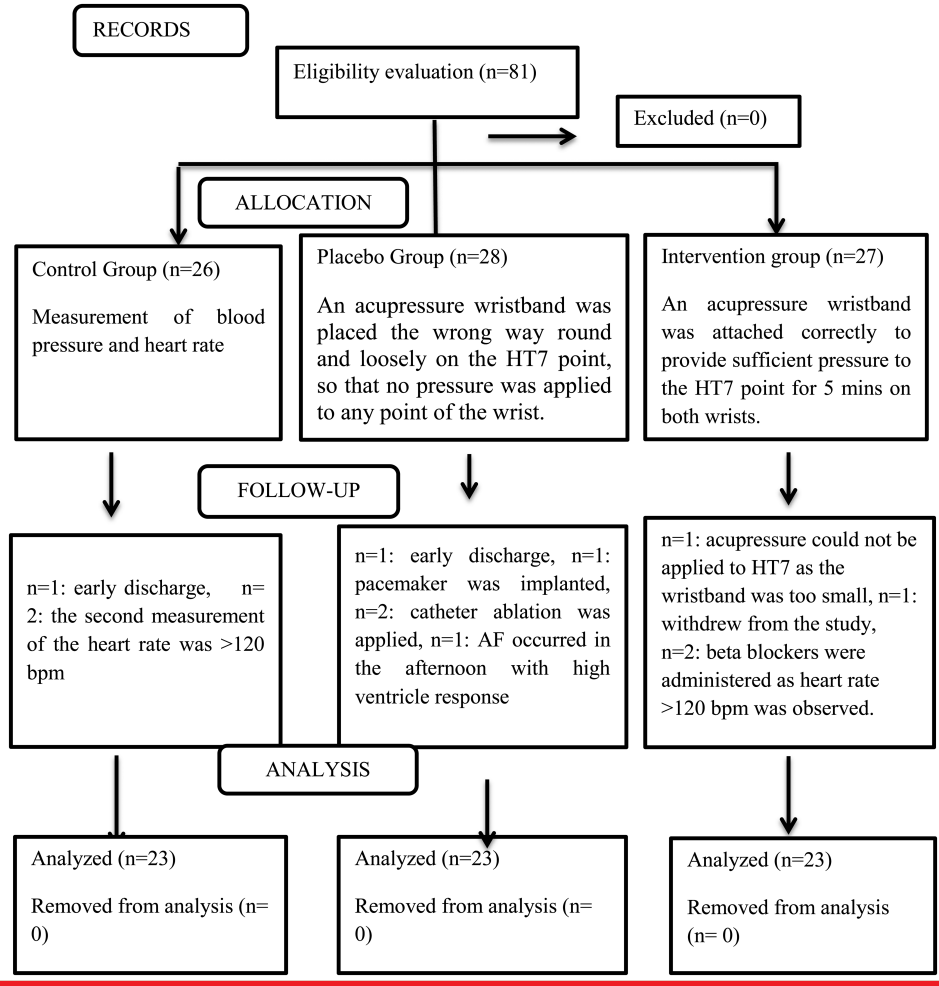

Figure 1. CONSORT Diagram.

Randomization and Blinding

Patient groups were determined by an independent intensive care nurse using a randomization method. The nurse randomly selected a piece of paper numbered 1, 2, or 3 from a bag, based on the patient's hospitalization order.[23] Number 1 corresponded to the control group, number 2 to the experimental group, and number 3 to the placebo group. The nurse was not informed about the group assignments. The aim was to assign patients to groups sequentially upon their admission to the intensive care units (ICUs) until the required sample size was achieved. Patients were unaware of their group assignments, and the identities of those participating in the study remained anonymous. The study followed a pre-test-post-test, placebo-controlled, randomized experimental design.

Data Collection Tools

The study data were collected using a Patient Information Form and a Data Record Form.

Patient Information Form

This form consisted of 15 questions designed to gather demographic and background information about the patients. It included details such as age, height, weight, marital status, education level, employment status, living arrangements, medications used, and health insurance status.

Data Record Form

This form was designed by the researchers to document the patients' blood pressure and heart rate values.

Process and Interventions

Placebo Group

The placebo group was provided with information about acupressure, including its purpose and its potential effects on blood pressure and heart rate. Participants were informed that the study aimed to examine the effects of acupressure on these parameters. In this group, no pressure was applied to any point on the wrist. Instead, an acupressure wristband was placed in a loose and inverted position over the Shenmen points (HT7). The wristbands remained in place for 5 minutes (Figure 2). Pre-test data on the patients' systolic blood pressure (SBP), diastolic blood pressure (DBP), and heart rate were collected prior to the application of the wristband at 9:00 AM and 3:00 PM on the same day. Post-test data, including SBP, DBP, and heart rate, were recorded 5 minutes after the wristband was applied at the same time points (Figure 4).

Intervention Group

The intervention group was provided with information about acupressure, including its purpose and its potential effects on blood pressure and heart rate. Participants were informed that the

Figure 2. Wristband.

Figure 3. Wristband and acupuncture.

study aimed to examine these effects. In this group, acupressure wristbands were placed on both wrists in the correct position to apply pressure to the Shenmen (HT7) point. Acupressure was administered, and the wristbands remained in place for 5 minutes (Figure 3). Pre-test data on the patients' systolic blood pressure (SBP), diastolic blood pressure (DBP), and heart rate were collected before applying the wristbands at 9:00 AM and 3:00 PM on the same day. Post-test data, including SBP, DBP, and heart rate, were recorded 5 minutes after the wristbands were applied at these same time points. Following recommendations from the literature, acupressure was performed twice in total: once at 9:00 AM and again at 3:00 PM, with the wristbands attached to the HT7 points on both wrists (Figure 4).[12,19,20]

Control Group

No procedures were performed on the patients in the control group. They were not provided with any information about acupressure in the context of the research. Control group patients were simply informed that their blood pressure and pulse values would be measured. All patients in this group received routine care and treatment as per standard practice (Figure 4).

Reliability Evaluation

The heart rate and blood pressure of the patients were continuously monitored before, during, and after the application of acupressure to assess for any negative effects of the intervention on these parameters. Patients were observed during acupressure application for potential adverse findings such as bradycardia, hypotension, and discomfort. Given the possibility of the acupressure wristband affecting circulation in the attached arm, patients were also monitored for side effects, including cyanosis, hematoma, and wrist pain.

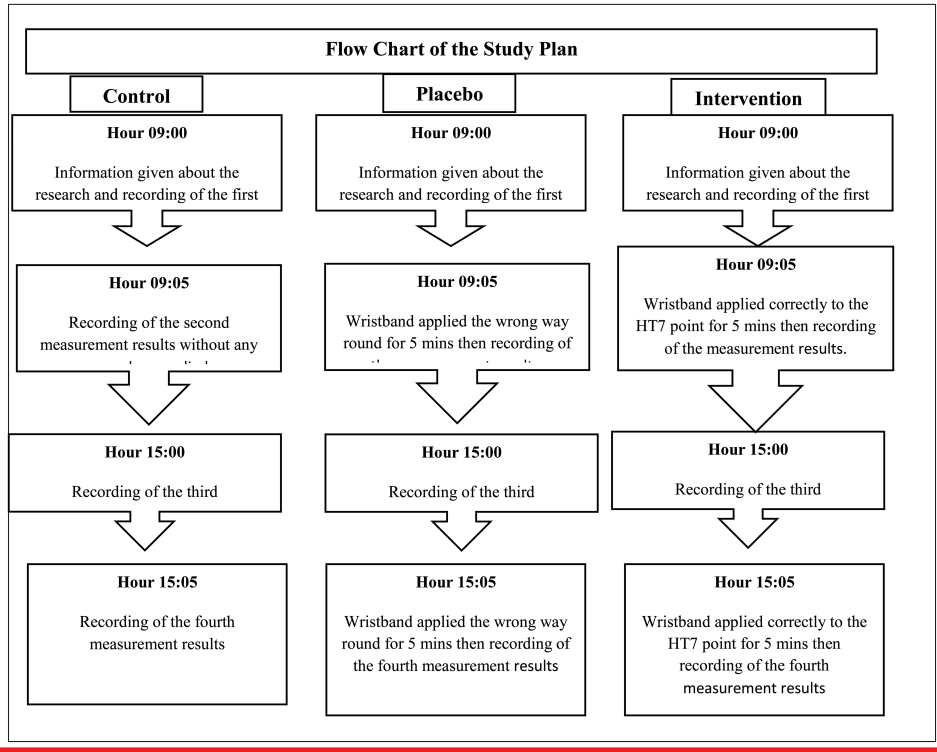

Figure 4. Flow chart of the study.

Acupressure Application Guidelines

The acupressure application guidelines were developed based on a review of the literature and expert opinions.[12,19,20]

- Patients were informed that acupressure would be applied twice on the same day, at 9:00 AM and 3:00 PM.
- A minimum interval of six hours was maintained between the two applications.
- Patients were advised that they might feel slight pain or pressure during the procedure and were informed they could terminate the session at any time if they felt discomfort.
- The acupressure points were identified individually for each patient using their own fingers.
- Applications were conducted at least one hour before or after meals to ensure patients did not have a full stomach during the procedure.
- The acupressure was performed in a quiet, well-lit, and well-ventilated environment.
- The area where acupressure was applied was cleaned and dried before the procedure.
- Patient confidentiality was respected throughout the process.
- Applications were conducted with the patient in a supine position.
- Before applying acupressure, effleurage (a gentle relaxation massage) was performed on the acupressure region for 1–2 minutes.
- Following the relaxation massage, the acupressure wristband was applied to the HT7 point, a chronometer was started, and the wristband was removed after five minutes.
- Acupressure was performed twice, at 9:00 AM and 3:00 PM on the same day. Blood pressure and heart rate were measured a total of four times: before and after each procedure.
- After each session, the patient was placed in a semi-Fowler position.

Ethical Approval

Ethical approval for the study was obtained from the Clinical Ethics Committee of the Faculty of Medicine at Kahramanmaraş Sütçü İmam University (Approval Number: 18, Date: January 31, 2018). Additionally, permission to conduct the study was granted by the university rectorate on February 20, 2018.

All participants provided informed consent prior to their inclusion in the study. The research was conducted in compliance with the Principles of the Declaration of Helsinki.

Statistical Analysis

The data obtained in the study were analyzed using IBM SPSS Statistics Standard Concurrent User version 26 software (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented as mean ± standard deviation (SD) for continuous variables and as number (n) and percentage (%) for categorical variables. The Fisher's Chi-square test was used for categorical data evaluations. Normality was assessed using the Shapiro-Wilk test. Systolic blood pressure, diastolic blood pressure, and heart rate values were compared across groups and measurement times using a two-way analysis of variance for repeated measures from general linear models. Bonferroni correction was applied for all pairwise comparisons in the two-way repeated measures analysis of variance. A p-value of <0.05 was considered statistically significant.

Results

Tables 1-3 evaluated 69 patients, comprising 49.3% males and 50.7% females. Of the total patients, 50% were aged ≥70 years, 92.8% were married, 52.2% had a basic level of literacy, 43.5% were obese, 49.3% were housewives, 94.2% did not work outside the home, and 69.6% lived together with their spouse and children. A chronic disease was determined in 66.7% of the patients, and diabetes mellitus was determined in 43.8%. Anticoagulant drugs were being taken by 91.7% of the patients. At the time of hospital presentation, 98.6% of the patients had experienced one or more symptoms, and 1.4% reported no symptoms. Palpitations were reported by 50.7% of the patients, fatigue by 55.1%, respiratory problems by 75.4%, shortness of breath by 79.7%, frequent sweating by 13%, chest pain by 46.4%, syncope by 13%, and insomnia by 27.5%. When the sociodemographic data, medical data, and AF symptoms were examined, a statistically significant difference was determined between the groups in respect of marital status, regular attendance at follow-up examinations, and symptoms of insomnia. Patients in the intervention group were determined to attend follow-up examinations more regularly and experienced more insomnia.

According to the comparisons between the groups in Table 4, there is no statistically significant difference in systolic blood pressure (SBP) values among the groups during the morning pre-procedure, morning post-procedure, afternoon pre-procedure, and afternoon post-procedure measurements. In the in-group comparisons, the SBP values of the control group showed a statistically significant difference across the measurement times (P = 0.024P = 0.024). The SBP value of the control group before the procedure was found to be lower than the SBP measured in the morning after the procedure. However, the SBP values of the placebo and experimental groups did not show a statistically significant change at the measurement times according to in-group comparisons.

According to intergroup comparisons (Table 4), there is no statistically significant difference between the diastolic blood pressure (DBP) values of the groups in the morning before the procedure, in the morning after the procedure, in the afternoon before the procedure, and in the afternoon after the procedure. According to intra-group comparisons, the DBP values in the placebo group differed significantly at different measurement times ($p < 0.001p < 0.001$). The afternoon DBP values of the placebo group before the procedure were statistically lower than the values recorded in the morning before the procedure and in the morning after the procedure. In contrast, according to intra-group comparisons, no statistically significant change was observed in the DBP values of the control and experimental group patients across measurement times.

According to intergroup comparisons (Table 4), there is no statistically significant difference between the groups' pulse values in the morning before the procedure, in the morning after the procedure, in the afternoon before the procedure, and in the afternoon after the procedure. According to

Table 1. Descriptive Data of the Patients

		Control		Placebo		Intervention		Total		
Sociodemographic characteristics		**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**P**
Gender	Female	13	37.1	8	22.9	14	40.0	35	50.7	0.185
	male	10	29.4	15	44.1	9	26.5	34	49.3	
Age (years) Mean ± SD 70.64 ± 10.75 Min. - Max 40-93	≤ 40	0	0	0	0	1	4.3	1	1.4	0.161
	41-50	0	0	2	8.7	1	4.3	3	4.3	
	51-60	2	8.7	4	17.4	1	4.3	7	10.1	
	61-70	12	52.2	4	17.4	7	30.4	23	33.3	
	70 ≤	9	39.1	13	56.5	13	56.5	35	50.7	
Marital status	Married	23	100	23	100	18	78.3	64	92.8	**0.009**
	Single	0	0	0	0	5	21.7		7.2	
Education Level	Illiterate	18	78.3	6	26.1	12	52.2	7	10.1	**0.002**
	Literate	0	0	2	8.7	5	21.7	36	52.2	
	Primary school	4	17.4	6	26.1	3	13.0	13	18.8	
	Middle school	1	4.3	9	39.1	3	13.0	13	18.8	
Body Mass Index	Normal	9	39.1	2	8.7	9	39.1	20	29.0	0.146
	Overweight	5	21.7	8	34.8	6	26.1	19	27.5	
	Obese	9	39.1	13	56.5	8	34.8	30	43.5	
Occupation	Housewife	13	56.5	7	30.4	14	60.9	34	49.3	0.308
	Manual worker	0	0	1	4.3	0	0	1	1.4	
	Retired	6	26.1	11	47.8	7	30.4	24	34.8	
	Clerical worker	0	0	1	4.3	0	0	1	1.4	
	Self-employed	0	0	1	4.3	1	4.3	2	2.9	
	Other	4	17.4	2	8.7	1	4.3	7	10.1	
Employment Status	Employed	1	4.3	1	4.3	2	8.7	4	5.8	1.000
	Unemployed	22	95.7	22	95.7	21	91.3	65	94.2	
Other people in the home	Living alone	4	17.4	4	17.4	5	21.7	13	18.8	0.429
	Spouse and children	17	73.9	18	78.3	13	56.5	48	69.6	
	Other family members	2	8.7	1	4.3	5	21.7	8	11.6	

Fisher Chi-square test, $p < 0.05$

intra-group comparisons, the pulse values of the placebo group differed significantly at measurement times (P = 0.026, P = 0.026). The afternoon pulse values of the placebo group after the procedure were statistically lower than the morning pre-procedure values. In contrast, according to intra-group comparisons, the pulse values of the control and experimental group patients did not show a statistically significant change between measurement times.

Discussion

Atrial fibrillation (AF) is a cardiovascular disease that poses a lifetime risk and significantly diminishes quality of life. In addition to medical treatments, complementary and alternative therapies (CAT) are also utilized. Among these, acupuncture is often chosen for its beneficial effects on heart functions.[12,24,25] Due to the limited data available in the literature, the findings of this study will be discussed in relation to those from similar studies.

As a result of the statistical analyses in this study, no significant differences were observed between the control, placebo, and intervention groups regarding systolic and diastolic blood pressure values measured before and after the procedures. Thus, it was determined that acupressure had no effect on blood pressure ($P > 0.05$). The H_{01} and H_{02} hypotheses of the study were confirmed, while the H_{11} and H_{12} hypotheses were rejected. In a study on hypotensive patients, Biçer[19] reported that acupressure balanced both low systolic and diastolic blood pressure. In another study, Biçer[20] found that acupressure applied to the Neiguan (PC6) acupuncture point in individuals with essential hypertension improved blood pressure. Similarly, Ceyhan et al.[12] applied

Table 2. Medical characteristics of the patients with AF

		Control		Placebo		Intervention		Total		
Medical Characteristics		**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**P**
Chronic disease	Present	15	65.2	16	69.6	15	65.2	46	66.7	1.000
	Absent	8	34.8	7	30.4	8	34.8	23	33.3	
Comorbid chronic disease	DM	6	37.5	8	50.0	7	43.8	21	43.8	0.583
	Hypertension	4	25.0	6	37.5	6	37.5	16	33.3	
	Other	5	37.5	2	12.5	3	18.8	11	22.9	
Drugs used	Anticoagulant	19	90.5	17	89.5	19	95.0	55	91.7	0.917
	Antiarrhythmic	1	4.8	1	5.3	1	5.0	3	5.0	
	Diuretic	0	0.0	1	5.3	0	0.0	1	1.7	
	Bronchodilator	1	4.8	0	0.0	0	0.0	1	1.7	
Regular attendance at check-ups	Always	5	21.7	4	17.4	2	8.7	11	15.9	**0.023**
	Usually	2	8.7	7	30.4	14	60.9	23	33.3	
	Sometimes	13	56.5	10	43.5	6	26.1	29	42.0	
	Never	3	13.0	2	8.7	1	4.3	6	8.7	
	Total	23	33.3	23	33.3	23	33.3	69	100	
Regular use of drugs	Always	12	52.2	7	30.4	8	34.8	27	39.1	0.342
	Usually	4	17.4	11	47.8	11	47.8	26	37.7	
	Sometimes	6	26.1	4	17.4	4	17.4	14	20.3	
	Never	1	4.3	1	4.3	0	0.0	2	2.9	
	Total	23	33.3	23	33.3	23	33.3	69	100	
Compliance with diet program	Always	4	17.4	0	0.0	0	0.0	4	5.8	0.065
	Usually	5	21.7	4	17.4	8	34.8	17	24.6	
	Sometimes	9	39.1	12	52.2	12	52.2	33	47.8	
	Never	5	21.7	7	30.4	3	13.0	15	21.7	
	Total	23	33.3	23	33.3	23	33.3	23	100	

Fisher Chi-square test, $p < 0.05$

acupressure to AF patients and observed its effectiveness in lowering systolic and diastolic blood pressure. Lin et al.[22] also stated that acupressure could be incorporated into nursing care plans, as it was found to lower blood pressure in hypertensive patients. In a systematic review and meta-analysis by Gao, ear acupressure treatment was shown to lower blood pressure values and help patients achieve blood pressure targets, suggesting its use as an adjunct to antihypertensive medications.[26] Additionally, other evidence in the literature indicates that acupressure can lower and balance high blood pressure. A systematic review and meta-analysis revealed that ear acupressure applied to patients with hypertension and insomnia had a positive effect on both lowering blood pressure and improving sleep quality.[27] A review by Soylu also highlighted studies demonstrating the therapeutic effects of acupressure on hypertension.[24] In contrast to these findings, our study concluded that acupressure had no effect on blood pressure. We believe this discrepancy with the literature is due to differences in the acupressure methods used and the characteristics of the patient sample.

In this study, a comparison of the values measured before and after the procedure revealed no statistically significant decrease in heart rate values in the intervention group ($P > 0.05p > 0.05$). Therefore, the H_{03} hypothesis of the study was confirmed, while the H_{13} hypothesis was rejected. In a study by Ceyhan et al.,[12] a decrease in heart rate was observed in the intervention group, and another study also reported that acupressure reduced heart rate.[20] The findings of these two studies do not align with the results of the current research. In our conclusion, this discrepancy in the effect of acupressure on heart rate could be attributed to differences in patient groups, the method of application, the number of acupressure sessions, and the specific points where acupressure was applied. Furthermore, the observed decrease in heart rate within the placebo group in our study suggests a possible placebo effect of acupressure.

There is additional evidence in the literature indicating that acupressure reduces high heart rate. In a study by Sugiura et al.,[28] acupressure applied using the planta pedis method resulted in a decrease in heart rate in all subjects. Wang et al.[25] observed a

Table 3. Distribution of patients according to AF-related symptoms experienced

		Control		Placebo		Intervention		Total		
AF-related symptoms		**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**P**
Symptoms present on admission to hospital	Yes	22	95.7	23	100	23	100	68	98.6	1.000
	No	1	4.3	0	0.0	0	0.0	1	1.4	
	Total	23	33.3	23	33.3	23	33.3	69	100	
Palpitations	Yes	13	56.5	13	56.5	9	39.1	35	50.7	0.431
	No	10	43.5	10	43.5	14	60.9	34	49.3	
	Total	23	33.3	23	33.3	23	33.3	69	100	
Fatigue	Yes	16	69.6	10	43.5	12	52.2	38	55.1	0.240
	No	7	30.4	13	56.5	11	47.8	31	44.9	
	Total	23	33.3	23	33.3	23	33.3	69	100	
Respiratory problems	Yes	18	78.3	18	78.3	16	69.6	52	75.4	0.828
	No	5	21.7	5	21.7	7	30.4	17	24.6	
	Total	23	33.3	23	33.3	23	33.3	23	100	
Shortness of breath	Yes	17	73.9	19	82.6	19	82.6	55	79.7	0.805
	No	6	26.1	4	17.4	4	17.4	14	20.3	
	Total	23	33.3	23	33.3	23	33.3	23	100	
Frequent sweating	Yes	4	17.4	2	8.7	3	13.0	9	13.0	0.902
	No	19	82.6	21	91.3	20	87.0	60	87.0	
	Total	23	33.3	23	33.3	23	33.3	69	100	
Chest pain	Yes	9	39.1	9	39.1	14	60.9	32	46.4	0.276
	No	14	60.9	14	60.9	9	39.1	37	53.6	
	Total	23	33.3	23	33.3	23	33.3	69	100	
Feeling faint	Yes	4	17.4	2	8.7	3	13.0	9	13.0	0.902
	No	19	82.6	21	91.3	20	87.0	60	87.0	
	Total	23	33.3	23	33.3	23	33.3	69	100.	
Insomnia	Yes	7	30.4	2	8.7	10	43.5	19	27.5	**0.040**
	No	16	69.6	21	91.3	13	56.5	50	72.5	
	Total	23	33.3	23	33.3	23	33.3	69	100.	

Fisher Chi-square test, P < 0.05

significant reduction in heart rate during and after acupuncture applied to the Shenmen acupuncture point in the left ear.

In a study by Haker,[29] the effects of acupuncture on the sympathetic and parasympathetic nervous systems were examined in healthy individuals, revealing a significant decrease in heart rate. Similarly, another study investigated the effects of sympathetic and vagal activation through acupuncture stimulation, reporting a 10% reduction in heart rate following the procedure in healthy subjects.[30]

The decrease in pulse is significant for heart rate control, one of the three primary objectives of treatment in patients with atrial fibrillation (AF). However, no reduction in heart rate was observed following the procedure in the current study. This highlights the need for further research on heart rate control and the application of acupressure using new, alternative, and potentially more effective methods. In this study, all blood pressure and heart rate values were recorded directly from device readings, ensuring the reliability and objectivity of the data. In contrast, some differences in the results reported in the literature may be attributed to manual measurements, which could introduce variability or bias.

Limitations

This study examined only patients with chronic atrial fibrillation (AF), and therefore, the results cannot be generalized to all patients with heart rhythm disorders (e.g., atrioventricular [AV] block, bradycardia, tachycardia, etc.). Additional limitations include the study being conducted at a single center and the evaluation of acupressure effects being restricted to the period during which patients were hospitalized. To prevent variability in application, only the HT7 point was used for the acupressure

Table 4. Comparisons between and within groups

	Groups			Test Statistics *	
Measurements	**Control *n*=23**	**Placebo *n*=23**	**Experiment *n*=23**	***F***	***P***
Systolic Blood Pressure					
Morning pre	132,17 ± 28,59[a]	126,26 ± 19,54	123,78 ± 13,24	0,933	0,398
Morning post	131,04 ± 28,79[a]	127,57 ± 18,13	120,04 ± 16,44	1,527	0,225
Afternoon pre	122,39 ± 27,28[b]	122,57 ± 15,38	123,83 ± 17,24	0,033	0,967
Afternoon post	122,26 ± 24,15[b]	122,91 ± 16,60	122,78 ± 18,35	0,007	0,993
Test Statistics †	*F*=3,370; *P*=**0,024**	*F*=0,812; *P*=0,492	*F*=0,809; *P*=0,493		
Diastolic Blood Pressure					
Morning pre	76,96 ± 14,86	75,17 ± 12,69[a]	71,26 ± 10,97	1,166	0,318
Morning post	73,91 ± 15,20	76,74 ± 15,31[a]	70,91 ± 10,68	1,010	0,370
Afternoon pre	71,00 ± 14,95	67,26 ± 11,36[b]	67,43 ± 10,53	0,663	0,519
Afternoon post	72,13 ± 13,21	69,70 ± 13,46[ab]	70,17 ± 12,34	0,226	0,798
Test Statistics †	*F*=2,522; *P*=0,066	*F*=7,834; *P* < **0,001**	*F*=1,567; *P*=0,208		
Heart Rate					
Morning pre	80,57 ± 18,00	87,74 ± 23,25[a]	84,00 ± 18,19	0,743	0,480
Morning post	83,83 ± 18,65	83,91 ± 21,18[ab]	81,04 ± 15,17	0,179	0,836
Afternoon pre	85,13 ± 19,01	80,48 ± 19,78[ab]	85,26 ± 15,76	0,512	0,602
Afternoon post	83,61 ± 17,57	78,91 ± 17,88[b]	85,39 ± 12,95	0,971	0,384
Test Statistics †	*F*=1,233; *P*=0,305	*F*=3,297; *P*=**0,026**	*F*=1,520; *P*=0,218		

MS: Model statistics, *Comparisons between groups in each row, superscripts a and b indicate differences between groups in each row.
MS: Group effect: *F*=0,309; *P*=0,735 Measurement effect: *F*=3,374; *P*=0,019
Groups* Measurement effect: *F*=2,122; *P*=0,052 Partial eta square=0,060 Power=0,752
MS: Group effect: *F*=0,589; *P*=0,558 Measurement effect: *F*=8,910; *p* < 0,001
Groups* Measurement effect: *F*=1,307; *P*=0,264 Partial eta square=0,038 Power=0,506
MS: Group effect: *F*=0,028; *P*=0,973 Measurement effect: *F*=0,444; *P*=0,722
Groups* Measurement effect: *F*=3,670; *P*=0,002 Partial eta square=0,100 Power=0,955

wristband, which may limit the exploration of effects from other acupressure points.

Conclusion

The results of this study showed no significant changes in blood pressure and heart rate after applying acupressure to patients with chronic atrial fibrillation (AF). Based on these findings, the use of acupressure in conjunction with pharmacological treatment to stabilize blood pressure and heart rate in patients with chronic AF cannot be recommended. However, the results of this study may provide valuable insights for future randomized controlled trials.

Ethics Committee Approval: Ethics committee approval was obtained from the Clinical Ethics Committee of the Faculty of Medicine at Kahramanmaraş Sütçü İmam University (Approval Number: 18, Date: January 31, 2018).

Informed Consent: All participants provided informed consent prior to their inclusion in the study.

Peer-review: Externally peer-reviewed

Author Contributions: Concept – A.S., M.K.; Design – A.S., M.K.; Supervision – M.K.; Resource – A.S., M.K.; Materials – A.S., M.K.; Data Collection and/or Processing – A.S.; Analysis and/or Interpretation – A.S., M.K.; Literature Review – A.S., M.K.; Writing – A.S., M.K.; Critical Review – A.S., M.K.

Acknowledgements: The authors thank all the patients who participated in the study.

Use of AI for Writing Assistance: The authors did not use generative artificial intelligence and artificial intelligence-supported technologies in the production of this article.

Conflict of Interests: The authors have no conflict of interests to declare.

Funding: This research received no funding from any source.

Etik Komite Onayı: Çalışmaya ilişkin etik kurul onayı Kahramanmaraş Sütçü İmam Üniversitesi Tıp Fakültesi Klinik Etik Kurulu'ndan alınmıştır (Onay Numarası: 18, Tarih: 31 Ocak 2018).

Bilgilendirilmiş Onam: Tüm katılımcılar çalışmaya dahil edilmeden önce bilgilendirilmiş onamlarını verdiler.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Konsept – A.S., M.K.; Tasarım – A.S., M.K.; Denetleme – M.K.; Kaynak – A.S., M.K.; Malzemeler – A.S., M.K.; Veri Toplanması ve/veya İşleme – A.S.; Analiz ve/veya Yorumlama – A.S., M.K.; Literatür Taraması – A.S., M.K.; Yazan – A.S., M.K.; Eleştirel İnceleme – A.S., M.K.

Teşekkür: Yazarlar çalışmaya katılan tüm hastalara teşekkürlerini sunar.

Yazma Yardımı için Yapay Zekanın Kullanımı: Yazarlar bu makalenin üretiminde üretken yapay zekâ ve yapay zekâ destekli teknolojileri kullanmamışlardır.

Çıkar Çatışması: Yazarların beyan edecekleri herhangi bir çıkar çatışması yoktur.

Finansal Destek: Bu araştırma için hiçbir kaynaktan finansal destek alınmamıştır.

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