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Original Research

Effect of auricular acupressure on comfort, pain and physiological indices after coronary artery angiography: A randomized controlled trial

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Abstract

Background and Purpose

Interventions to prevent bleeding may cause discomfort after coronary angiography. This study aimed to examine the effectiveness of auricular acupressure on comfort, pain intensity, and physiological indices after coronary angiography.

Material and Method

This two-arm (1:1) randomized controlled trial was conducted at Farshchian Heart Center, Hamadan (western Iran) from April to June 2024. Eighty-four eligible patients were split into intervention (n = 42) and control (n = 42) groups. In the intervention group, Vaccaria seeds were stuck at the right ear's TF2, SF5, HX1, and AT2 points for 2 h post-angiography. The control group received no acupressure. The Numeric Rating Scale measured comfort and pain intensity, and physiological indices such as mean arterial pressure, heart rate, and peripheral oxygen saturation were measured before acupressure and at 60- and 120-min post-intervention.

Results

Analysis of 83 patients showed no significant demographic and clinical differences between groups pre-study ($P > 0.05$). Significant pain intensity and comfort improvements were noted in the intervention group compared to the control group at 60 and 120 min post-intervention ($P < 0.05$). Additionally, significant reductions in heart rate and mean arterial pressure were observed in the intervention group ($P < 0.05$), while no significant differences were found in arterial oxygen saturation between the intervention and control groups ($P > 0.05$).

Conclusion

Auricular acupressure, an easy, simple, low-cost complementary method, could help in pain management, increase comfort after coronary angiography, and positively affect mean arterial pressure and heart rate. Nurses can play a crucial role in applying these techniques, ensuring proper implementation, and educating patients about their benefits.

Introduction

Coronary artery disease (CAD) is the most common cardiovascular disease in adults and causes 17.9 million deaths annually worldwide.[1] Coronary angiography (CA) is the gold standard for diagnosing and treating CAD.[2] Today, the trans-radial artery (TRA) is used for CA because of its reduced mortality, easy access, and low cost.[3] To control bleeding after TRA access, the TR Band®, which is a pressure device that is placed in the patient's wrist, puts pressure on the puncture site and prevents bleeding, is usually used. Despite the positive effect of the TR band, it causes discomfort, pain, numbness, and swelling in the patient's hand.[4,5]

Pain is a natural and protective response that occurs after real or potential tissue damage, and its continuation can affect patients' comfort, limit patient activity, increase patients' physical and mental recovery time, and increase their heart workload, blood pressure (BP), heart rate (HR) and respiratory rate (RR).[6,7] Comfort is one of the factors controlling the mental state of patients. Comfort is defined as a situation in which patients feel relaxed mentally and physically; do not have any unpleasant feelings, such as pain or numbness; and meet their physical, psychological, and social needs.[8]

In nursing care, ensuring patient comfort not only addresses the immediate physical needs of patients but also plays a critical role in promoting their overall well-being and recovery. Holistic nursing care emphasizes treating the patient as a whole—considering their emotional, psychological, and social needs and physical health. When patient comfort is ensured, their overall satisfaction with healthcare services also increases. This, in turn, fosters a more positive healthcare experience and enhances patient trust in the care provided, ultimately contributing to better patient outcomes and higher levels of patient engagement in their care.[8]

Pharmacological and non-pharmacological methods can be used to control pain and discomfort. Pharmacological methods include nonsteroidal anti-inflammatory drugs and opioid drugs. These pharmacological methods have side effects such as constipation, fatigue, drowsiness, nausea, vomiting, and gastrointestinal bleeding.[9,10] Auricular acupressure (AA) is a non-pharmacological method and is part of traditional Chinese medicine (TCM). Today, the use of these methods has increased due to easy learning, convenient access, and cost-effectiveness.[11] According to TCM theory, diseases may be caused by energy or Qi imbalances. The ear contains acupoints that reflect the entire body, and stimulating these points can help rebalance Yin and Yang, regulate Qi, and activate meridians and collaterals.[12] Vaccaria and magnetic seeds coated with approximately 2 mm waterproof tapes are used to stimulate the ear points.[13]

To date, many studies have investigated the effects of AA. For example, studies on the effects of auricular acupressure on pain management,[14] stress and sleep,[15] body weight control,[16] depression,[17] and vital signs[18] have reported varying conclusions about the effects of AA.

To the best of our knowledge, studies on the effects of auricular acupressure on patient comfort and pain after CA are limited. On the other hand, some available evidence has reported contradictory results regarding the effectiveness of acupressure in different clinical situations.[19, 20] In this study, the TF2, SF5, HX1, and AT2 points in the ear were stimulated, which is suggested to reduce wrist pain.[21] No studies have been conducted in the literature on the use of AA at these points to manage pain, comfort, and physiological indices in patients after CA, highlighting the necessity for research in this area. Considering the importance of managing pain and comfort after CA and the growing interest in complementary therapies, this study aims to examine the impact of auricular acupressure at the TF2, SF5, HX1, and AT2 points on comfort, pain intensity, and physiological indices after CA.

Section snippets

Study design and setting

This randomized clinical trial was conducted at the Farschian Heart Center in Hamadan city, western Iran, from April to June 2024. This study was designed and conducted according to the Standards for Reporting Interventions in Controlled Trials of Acupuncture (STRICTA) guidelines[22] and the CONSORT (Consolidated Standards of Reporting Trials) statement.[23] Fig. 1 depicts the flowchart of this clinical trial. …

Study participants

The inclusion criteria for patients were signing an informed consent form, being …

Clinical and demographic information

Demographic information such as age, sex, residency, level of education, job, body mass index (BMI), and marital status was collected. Clinical information included history of hospitalization, angiography, open heart history, smoking, drug use, diabetes, and hypertension. …

Numeric rating scale (NRS)

The NRS is commonly used for measuring pain intensity. It is scored from 0 to 10 (a score of 0 obtained from the NRS indicates no pain and severe discomfort, 1–4 points indicate mild pain and low comfort, 4–7 points indicate …

Study population characteristics

Among the 130 patients eligible for the study, 10 patients did not meet the inclusion criteria, and 36 patients declined to participate. Consequently, 84 eligible patients were equally (n = 42) allocated to the intervention and control groups. During the follow-up period, one patient left the study after randomization. Thus, the final analysis was conducted on 83 patients.

The results did not reveal significant differences in demographic or clinical information between the two groups ($p > 0.05$) (…

Discussion

This clinical trial examined the effects of AA on comfort, pain intensity, and physiological indices in patients after CA. It was found that simulating the TF2, SF5, HX1, and AT2 points of the ear after CA can reduce pain and increase comfort**.** This study is the first to investigate the impact of auricular acupressure on comfort, pain, and physiological indices following trans-radial coronary angiography. By exploring this novel intervention, our research provides valuable insights and …

Limitations

This study has several notable strengths. Firstly, it is the first randomized experimental study to evaluate the effects of AA applied after CA. The use of AA as a non-pharmacological method and examining its effects are significant strengths of this study. While the research findings are expected to contribute substantially to the literature, there are some limitations to consider. Firstly, subjective scales were used to assess pain and comfort, which individual differences, cultural factors, …

Implications for practice, policy, and future research

The results of this study suggest that AA is an effective, non-invasive, and low-cost method for managing pain and increasing comfort in patients after CA. Nurses can play a crucial role in implementing these techniques and educating patients about their benefits. Further research is needed to confirm these findings and explore the long-term effects of AA on patient outcomes. …

Conclusion

The findings of this study demonstrate that AA effectively reduces pain and discomfort and improves physiological indices in patients after CA. AA as an easy, simple, low-cost complementary method can be a valuable addition to pain management strategies in cardiac care, with potential implications for clinical practice and patient education. More studies are needed to validate these results and explore the broader applications of AA in healthcare. …

Abbreviations

CAD: Coronary artery disease; CA: Coronary angiography; AA: Auricular acupressure; TCM: Traditional Chinese medicine; NRS: Numeric rating scale; BMI: Body mass index; MAP: Mean arterial pressure; HR: Heart rate; SPO2: Peripheral oxygen saturation. …

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The present article results from a thesis approved by Hamadan University of Medical Sciences (Registration No. 140210199331), Iran. …

Availability of data and materials

The databases generated and/or analyzed during the current study are not publicly available due to privacy concerns and the need to protect participant confidentiality. However, the data are available from the corresponding author upon reasonable request for academic research and verification. …

Ethics approval and consent to participate

This study was designed and conducted under the principles of the Helsinki Declaration (Fortaleza Version, 2012). The trial was registered with the Ethics Committee of Hamadan University of Medical Sciences, bearing the registration number IR.UMSHA.REC.1402.640. Additionally, the study was registered with the Iranian Registry of Clinical Trials with the identifier [IRCT2023 1028059875N1||https://irct.behdasht.gov.ir/trial/73399 ↗] on [*January* 30, 2024]. All study participants were informed about …

Consent for publication

Not applicable. …

CRediT authorship contribution statement

Fatemeh Asadi: Writing – review & editing, Writing – original draft, Software, Methodology, Investigation, Formal analysis, Conceptualization. **Azim Azizi:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Mahdi Biglarkhani:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Conceptualization. **Seyed Kianoosh Hosseini:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Conceptualization. **Younes** …

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