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RESEARCH ARTICLE

Investigation of the Effects of Acupuncture on Post-Operative Chest Pain after Open Heart Surgery

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Background: Coronary artery bypass grafting (CABG) accounts for more than half of all adult cardiac surgeries worldwide. Post-operative chest pain is a common CABG complication and can cause significant discomfort.
Objectives: Because taking large amounts of analgesics can have many side effects, we evaluated whether acupuncture effectively reduces pain and the use of analgesics by CABG patients.
Methods: In this clinical trial, 30 patients who had recently undergone CABG were randomly allocated to two groups. For both groups, exercise therapy and routine analgesics were recommended. The intervention group underwent bilateral acupuncture in distinct acupoints, including the HT3, HT4, HT5, HT6, HT7, PC3, PC5, PC6, and PC7 for 10 daily sessions constantly. Visual analog scale (VAS) and analgesic use were evaluated in both groups at baseline and after completing the 10-day treatment.
Results: Our analysis revealed significant decreases in the mean VAS scores in both the intervention and the control group, and that the reduction was more significant in the acupuncture group ($p < 0.001$). Moreover, analgesic use was significantly lower in the acupuncture group when compared with the control group ($p < 0.001$).
Conclusion: Our findings highlight acupuncture as an alternative method of controlling CABG-associated post-operative chest pain and reducing the use of analgesics, which might have many side effects.

Keywords: Acupuncture treatment, Coronary artery bypass grafting, Post operation pain

INTRODUCTION

Coronary artery bypass grafting (CABG) accounts for nearly half of all adult cardiac surgeries [1]. CABG is commonly associated with persistent postoperative chest pain, which causes significant discomfort and negatively impacts the patients' quality of life. In follow-up visits, many CABG patients report persistent chest pain upon movement or even when at rest [2,3]. The insertion of chest tubes, surgical incisions, intercostal nerve injuries, and pleura stimulation during thoracotomies, stimulates many nociceptors, resulting in chronic postoperative pain [4]. Pain is also caused by inflammation mediators, such as prostaglandins, ions, cytokines, and growth factors, resulting in peripheral sensitization and reduced nociceptor thresholds [5]. Effective pain management is critical because pain affects the patients' physical and psychological wellbeing and may increase morbidity and mortality [6]. There are numerous pain management methods, and they all have side effects. The main method of pain management is the use of analgesics, such as narcotics and nonsteroidal anti-inflammatory drugs (NSAIDs). Long term use of systemic analgesics can lead to adverse side effects, including gastrointestinal distress, ileus, dizziness, pruritus, urinary retention, and depressive symptoms [7]. Therefore, complementary non-pharmacological strategies, such as acupuncture, have been used to improve postoperative pain management and to reduce the use of systemic analgesics [6]. The use of acupuncture dates back by about 2,500 years in China. It is based on the paradigm that each visceral organ is associated with a specific acupuncture point and that internal disorders can be treated by stimulating these points [8], usually by inserting needles

CONCLUSIONS

Acupuncture might be an appropriate alternative method of controlling post-operative chest pain and reducing the use of analgesics, which may have many side effects in CABG patients.

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AUTHORS' CONTRIBUTIONS

Authors had equal contribution in all aspects of this trial.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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REFERENCES

1. D'Agostino RS, Jacobs JP, Badhwar V, Fernandez FG, Paone G, Wormuth DW, et al. The Society of Thoracic Surgeons Adult Cardiac Surgery Database: 2018 update on outcomes and quality. Ann Thorac Surg 2018;105:15-23. https://doi.org/10.1016/j.athoracsur.2017.10.035
2. Herlitz J, Brandrup-Wognsen G, Evander MH, Caidahl K, Hartford M, Karlson BW, et al. Symptoms of chest pain and dyspnoea during a period of 15 years after coronary artery bypass grafting. Eur J Cardiothorac Surg 2010;37:112-8. https://doi.org/10.1016/j.ejcts.2009.06.018
3. Gimpel D, Fisher R, Khan Z, McCormack DJ. Primary care management of chest pain after coronary artery bypass surgery. BMJ 2019;365:l1303. https://doi.org/10.1136/bmj.l1303
4. Coura LE, Manoel CH, Poffo R, Bedin A, Westphal GA. Randomised, controlled study of preoperative electroacupuncture for postoperative pain control after cardiac surgery. Acupunct Med 2011;29:16-20. https://doi.org/10.1136/aim.2010.003251
5. Lundeberg T. Preoperative acupuncture: postoperative analgesia? Acupunct Med 2011;29:5-6. https://doi.org/10.1136/aim.2011.004002
6. Liu XL, Tan JY, Molassiotis A, Suen LK, Shi Y. Acupuncture-point stimulation for postoperative pain control: a systematic review and meta-analysis of randomized controlled trials. Evid Based Complement Alternat Med 2015;2015:657809. https://doi.org/10.1155/2015/657809
7. Gerner P. Postthoracotomy pain management problems. Anesthesiol Clin 2008;26:355-67, vii. https://doi.org/10.1016/j.anclin.2008.01.007
8. Fan Y, Kim DH, Gwak YS, Ahn D, Ryu Y, Chang S, et al. The role of substance P in acupuncture signal transduction and effects. Brain Behav Immun 2021;91:683-94. https://doi.org/10.1016/j.bbi.2020.08.016
9. Tedesco D, Gori D, Desai KR, Asch S, Carroll IR, Curtin C, et al. Drug-free interventions to reduce pain or opioid consumption after total knee arthroplasty: a systematic review and meta-analysis. JAMA Surg 2017;152:e172872. https://doi.org/10.1001/jamasurg.2017.2872
10. Marshall K, McLaughlin K. Pain management in thoracic surgery. Thorac Surg Clin 2020;30:339-46. https://doi.org/10.1016/j.thorsurg.2020.03.001
11. Maxwell C, Nicoara A. New developments in the treatment of acute pain after thoracic surgery. Curr Opin Anaesthesiol 2014;27:6-11. https://doi.org/10.1097/ACO.0000000000000029
12. Tavakoli K, Amini P, Taghavi Razavizadeh R, Mohammadi S, Golcheyan A. [The effect of acupuncture on pain score after open kidney surgery]. Par J Med Sci 2015;12:47-52. Persian. https://doi.org/10.29252/JMJ.12.4.7
13. Taghavi R, Tabasi KT, Mogharabian N, Asadpour A, Golchian A, Mohamadi S, et al. The effect of acupuncture on relieving pain after inguinal surgeries. Korean J Pain 2013;26:46-50. https://doi.org/10.3344/kjp.2013.26.1.46
14. Mikashima Y, Takagi T, Tomatsu T, Horikoshi M, Ikari K, Momohara S. Efficacy of acupuncture during post-acute phase of rehabilitation after total knee arthroplasty. J Tradit Chin Med 2012;32:545-8. https://doi.org/10.1016/s0254-6272(13)60068-0
15. Deng G, Rusch V, Vickers A, Malhotra V, Ginex P, Downey R, et al. Randomized controlled trial of a special acupuncture