

#1973 - Remote Ischemic Preconditioning in patients undergoing coronary angiography and angioplasty

Authors and Affiliations

Zahra Shafii, MD, Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences, Tehran, Iran (shafii_zahra@yahoo.com)
Seyed Mohammad Mahdi Peyghambari, MD, Cardiovascular Intervention Research Center, Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences, Tehran, Iran (mehdipei@gmail.com)
Hoda Rafiee, MD, Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences, Tehran, Iran, h.b.raffiei@gmail.com

Corresponding Author and email

Zahra Shafii (shafii_zahra@yahoo.com)

Body

Introduction: remote ischemic preconditioning (RIPC) is shown to preserve kidney function in patients at high risk of contrast-induced acute kidney injury (CI-AKI), the effect in patients at moderate to high risk remains unknown. This study performed for evaluating RIPC in moderate to high risk patients undergoing coronary angiography or angioplasty.

Methods: 100 patients with glomerular filtration rate ≤ 60 ml/min/1.73 m² or Creatinine ≥ 1.4 mg/dl) randomly divided in 2 RIPC and control groups and RIPC was done in 50 patients with 4 episode of cuff inflation and deflation in 5 min, 50 mmHg above systolic blood pressure and cuff inflation in control group was 20 mmHg below systolic pressure. Then patients were observed with kidney function test and urinary output in 2-7 days after procedure

Conclusion and Results: there was not significant difference in risk factors and contrast media volume between two groups, prevalence of CIN in RIPC group was 7 (14%) versus 13 (26%) in control group (P value: 0.105) and one patient in control group needed hemodialysis, further evolution with greater sample size may be needed for high risk patients

Keywords: Contrast-induced acute kidney injury; Coronary

#1973 - Remote Ischemic Preconditioning in patients undergoing coronary angiography and angioplasty

angiography;Remote ischemic preconditioning

References

1. Libby P, Bonow RO, Mann DL, Zipes DP, Braunwald E, Achenbach S. Braunwald's heart disease a text book of cardiovascular medicine. 10th ed. Philadelphia: Saunders; 2015.ch 19.
2. Heyman SN, Rosen S, Rosenberger C. Renal parenchymal hypoxia, hypoxia adaptation and the pathogenesis of radiocontrast nephropathy. Clin J Am Soc Nephrol. 2008;3:288-296. doi: 10.2215/CJN.02600607.
3. Katzberg RW. Contrast medium-induced nephrotoxicity; Which pathway? Radiology. 2005;235:752-755. doi: 10.1148/radiol.2353041865.
4. Persson PB, Hansell P, Liss P. Pathophysiology of contrast medium-induced nephropathy. Kidney International. 2005;68:14-22. doi: 10.1111/j.1523-1755.2005.00377.x.
5. 31. Heyman SN, Reichman J, Brezis M. Pathophysiology of radiocontrast nephropathy. Invest Radiol. 1999;34:685-691. doi: 10.1097/00004424-199911000-00004.
6. Haller C, Hizoh I. The cytotoxicity of iodinated radiocontrast agents on renal cells in vitro. Invest Radiol. 2004;39:149-154. doi: 10.1097/01.rli.0000113776.87762.49.

#1973 - Remote Ischemic Preconditioning in patients undergoing coronary angiography and angioplasty

7. Morcos SK, Thomsen HS, Webb JA (1999) Contrast-media-induced nephrotoxicity: a consensus report. Contrast Media Safety Committee, European Society of Urogenital Radiology (ESUR). *Eur Radiol* 9:1602-1613
8. Hou SH, Bushinsky DA, Wish JB, Cohen JJ, Harrington JT (1983) Hospital-acquired renal insufficiency: a prospective study. *Am J Med* 74:243-248
9. Nash K, Hafeez A, Hou S (2002) Hospital-acquired renal insufficiency. *Am J Kidney Dis* 39:930-936

1. Maioli M, Toso A, Leoncini M, Gallopin M, Musilli N, Bellandi F (2012) Persistent renal damage after contrast-induced acute kidney injury: incidence, evolution, risk factors, and prognosis. *Circulation* 125:3099-3107
2. Weisbord SD, Chen H, Stone RA, Kip KE, Fine MJ, Saul MI, Palevsky PM (2006) Associations of increases in serum creatinine with mortality and length of hospital stay after coronary angiography. *J Am Soc Nephrol* 17:2871-2877
3. Mehran R, Nikolsky E (2006) Contrast-induced nephropathy: definition, epidemiology, and patients at risk. *Kidney Int Suppl* 100:S11-S15
4. Mehran R, Aymong ED, Nikolsky E, Lasic Z, Iakovou I, Fahy M, Mintz GS, Lansky AJ, Moses JW, Stone GW, Leon MB, Dangas G (2004) A simple risk score for prediction of contrast-induced nephropathy after percutaneous coronary intervention: development and initial validation. *J Am Coll Cardiol* 44:1393-1399
5. Solomon RJ, Natarajan MK, Doucet S, Sharma SK, Staniloae CS, Katholi RE, Gelormini JL, Labinaz M, Moreyra AE (2007) Cardiac angiography in renally impaired patients (CARE) study: a randomized double-blind trial of contrast-induced nephropathy in patients with chronic kidney disease. *Circulation* 115:3189-3196
6. Kwok CS, Pang CL, Yeong JK, Loke YK (2011) Measures used to treat contrast-induced nephropathy: overview of reviews. *Br J Radiol* 86:20120272
7. Er F, Nia AM, Dopp H, Hellmich M, Dahlem KM,

#1973 - Remote Ischemic Preconditioning in patients undergoing coronary angiography and angioplasty

- Caglayan E, Kubacki T, Benzing T, Erdmann E, Burst V, Gassanov N (2012) Ischemic preconditioning for prevention of contrast medium-induced nephropathy: randomized pilot RenPro Trial (Renal Protection Trial). *Circulation* 126:296-303
8. Deftereos S, Giannopoulos G, Tzalamouras V, Raisakis K, Kossyvakis C, Kaoukis A, Panagopoulou V, Karageorgiou S, Avramides D, Toutouzas K, Hahalis G, Pyrgakis V, Manolis AS, Alexopoulos D, Stefanadis C, Cleman MW (2013) Renoprotective effect of remote ischemic post-conditioning by intermittent balloon inflations in patients undergoing percutaneous coronary intervention. *J Am Coll Cardiol* 61:1949-1955
 9. Swartz RD, Rubin JE, Leeming BW, Silva P (1978) Renal failure following major angiography. *Am J Med* 65:31-37
 10. Herzog CA (2011) Kidney disease in cardiology. *Nephrol Dial Transpl* 26:46-50
 11. 24. Igarashi G, Iino K, Watanabe H, Ito H (2013) Remote Ischemic Pre-Conditioning Alleviates Contrast-Induced Acute Kidney Injury in Patients With Moderate Chronic Kidney Disease. *Circ J*
 12. [Savaj S](#), [Savoj J](#), [Jebraili I](#), [Sezavar SH](#).
 13. Remote ischemic preconditioning for prevention of contrast induced acute kidney injury in diabetic patients. [Iran J Kidney Dis](#). 2014 Nov;8(6):457-60.
 14. [Pei H](#)¹, [Wu Y](#)¹, [Wei Y](#)², [Yang Y](#)¹, [Teng S](#)¹, [Zhang H](#)¹. Remote ischemic preconditioning reduces perioperative cardiac and renal events in patients undergoing elective coronary intervention: a meta-analysis of 11 randomized trials. [PLoS One](#). 2014 Dec 31;9(12):e115500. doi: 10.1371/journal.pone.0115500. eCollection 2014.
 15. [Yamanaka T](#), [Kawai Y](#), [Miyoshi T](#), [Mima T](#), [Takagaki K](#), [Tsukuda S](#), [Kazatani Y](#), [Nakamura K](#), [Ito H](#). Remote ischemic preconditioning reduces contrast-induced acute kidney injury in patients with ST-elevation myocardial infarction: a randomized controlled trial. *Int J Cardiol*. 2015 Jan 15;178:136-41. doi: 10.1016/j.ijcard.2014.10.135. Epub 2014 Oct 23.
 16. 40. [Hu J](#), [Liu S](#), [Jia P](#), [Xu X](#), [Song N](#), [Zhang T](#), [Chen R](#), [Ding X](#). Protection of remote ischemic preconditioning

#1973 - Remote Ischemic Preconditioning in patients undergoing coronary angiography and angioplasty

- against acute kidney injury: a systematic review and meta-analysis. 2016 Apr 20;20(1):111. doi: 10.1186/s13054-016-1272-y.
17. [Bei WJ](#), [Duan CY](#), [Chen JY](#), [Wang K](#), [Liu YH](#), [Liu Y](#), [Tan N](#). Remote Ischemic Conditioning for Preventing Contrast-Induced Acute Kidney Injury in Patients Undergoing Percutaneous Coronary Interventions/Coronary Angiography: A Meta-Analysis of Randomized Controlled Trials. [J Cardiovasc Pharmacol Ther.](#) 2016 Jan;21(1):53-63. doi: 10.1177/1074248415590197. Epub 2015 Jun 24.
 18. [Wang F](#)¹, [Yin J](#)², [Lu Z](#)², [Zhang G](#)³, [Li J](#)², [Xing T](#)⁴, [Zhuang S](#)⁵, [Wang N](#)⁶. Limb ischemic preconditioning protects against contrast-induced nephropathy via renalase. [EBioMedicine.](#) 2016 Jul;9:356-365. doi: 10.1016/j.ebiom.2016.05.017. Epub 2016 May 18.
 19. [Balbir Singh G](#), [Ann SH](#), [Park J](#), [Chung HC](#), [Lee JS](#), [Kim ES](#), [Choi JI](#), [Lee J](#), [Kim SJ](#), [Shin ES](#). Remote Ischemic Preconditioning for the Prevention of Contrast-Induced Acute Kidney Injury in Diabetics Receiving Elective Percutaneous Coronary Intervention. [PLoS One.](#) 2016 Oct 10;11(10):e0164256. doi: 10.1371/journal.pone.0164256. eCollection 2016
 20. [Zagidullin NS](#), [Dunayeva AR](#), [Plechev VV](#), [Gilmanov AZ](#), [Zagidullin SZ](#), [Er F](#), [Pavlov VN](#). Nephroprotective effects of remote ischemic preconditioning in coronary angiography. [Clin Hemorheol Microcirc.](#) 2017;65(3):299-307. doi: 10.3233/CH-16184.
 21. [Koch C](#), [Chaudru S](#), [Lederlin M](#), [Jaquinandi V](#), [Kaladji A](#), [Mahé G](#). Remote Ischemic Preconditioning and Contrast-Induced Nephropathy: A Systematic Review. [Ann Vasc Surg.](#) 2016 Apr;32:176-87. doi: 10.1016/j.avsg.2015.10.017. Epub 2016 Jan 21.