

Letter to the Editor: Intraoperative renal hypoxia and risk of cardiac surgery-associated acute kidney injury

Roomi Raja ¹, Muhammad fahad Amin¹, and Satesh Kumar²

¹Ziauddin University

²Shaheed Mohtarma Benazir Bhutto Medical College

April 11, 2022

Title Page:

Title: Letter to the Editor: Intraoperative renal hypoxia and risk of cardiac surgery-associated acute kidney injury

Article Type: Letter to the Editor

Correspondence: 1. Roomi Raja

Contact No: +92-3342946940. Email: Romirajagoindani@Yahoo.Com

Institute: Ziauddin University Karachi

Address: Hemilton Courts Block G-1 Flat 408 Near Teen Talwar Clifton Karachi

ORCID: 0000-0001-9104-3644

Co-Authors: 2. Muhammad fahad Amin

Contact No: +92-3408056755. Email: fahad.a.maya@gmail.com

Institute: Ziauddin university karachi

Address: 128/2 14th street off khayaban e muhafiz phase 6 defence housing authority karachi

ORCID: 0000-0003-1861-5313

Co-Authors: 3. Satesh Kumar

Contact No: +92-3325252902. Email: Kewlanisatish@Gmail.Com

Institute: Shaheed Mohtarma Benazir Bhutto Medical College Liyari, Karachi

Address: Parsa Citi Garden East, Karachi

ORCID: 0000-0001-7975-6297

Word Count: 302

Letter:

Dear editor,

It was an enormous delight to read the article "Intraoperative renal hypoxia and risk of cardiac surgery-associated acute kidney injury" by Jennifer P. Ngo et Al.¹ The author's endeavors are admired concerning this important topic and need to be acknowledged by the readers. We agree with the conclusion of the study

that urinary oxygen tension (UPO₂) strongly predicts renal injury post-cardiac surgery. In contrast, plasma erythropoietin (pEPO) does not show an association with renal injury. However, few concerns have been interrupting the validity of the study.

Firstly, as well known, viscosity is associated with decreased supply of blood to the organs and therefore causes hypoperfusion of the organs and ischemia resulting in organ damage. Therefore the authors should have included hemodilution as one variable since hemodilution decreases the viscosity. For example, a 2006 study included hemodilution as one of the steps in the surgical procedure and found out hemodilution increases the risk of renal injury.² Additionally, not including participants from different demographics has been found to be associated with the difference in the study's outcomes. For illustration, a study in 2008 included black and white participants that strengthened their study and supported their findings.³

Moreover, this study's small sample size could alter the authenticity of the study's outcomes. This is why the authors should have opted to include a large number of participants. For example, a 2011 study included 1219 participants in their study, which increased their study's efficacy.⁴ Lastly, the authors should also have looked for additional laboratory values of endotoxins and elevated levels of tumor necrosis factor-alpha. They should have excluded the use of some nephrotoxic drugs and nonsteroidal anti-inflammatory drugs because of their strong relation to causing injury to the kidney. For illustration, a study in 2012 found a positive association of their factors with renal injury.⁵

References:

- 1- Ngo JP, Noe KM, Zhu MZL, Martin A, Ollason M, Cochrane AD, Smith JA, Thrift AG, Evans RG. Intraoperative renal hypoxia and risk of cardiac surgery-associated acute kidney injury. *J Card Surg.* 2021 Oct;36(10):3577-3585. doi: 10.1111/jocs.15859. Epub 2021 Jul 29. PMID: 34327740.
- 2- Rosner MH, Okusa MD. Acute kidney injury associated with cardiac surgery. *Clin J Am Soc Nephrol.* 2006 Jan;1(1):19-32. doi: 10.2215/CJN.00240605. Epub 2005 Oct 19. PMID: 17699187.
- 3- Dasta JF, Kane-Gill SL, Durtschi AJ, Pathak DS, Kellum JA. Costs and outcomes of acute kidney injury (AKI) following cardiac surgery. *Nephrol Dial Transplant.* 2008 Jun;23(6):1970-4. doi: 10.1093/ndt/gfm908. Epub 2008 Jan 4. PMID: 18178605.
- 4- Parikh CR, Coca SG, Thiessen-Philbrook H, Shlipak MG, Koyner JL, Wang Z, Edelstein CL, Devarajan P, Patel UD, Zappitelli M, Krawczeski CD, Passik CS, Swaminathan M, Garg AX; TRIBE-AKI Consortium. Postoperative biomarkers predict acute kidney injury and poor outcomes after adult cardiac surgery. *J Am Soc Nephrol.* 2011 Sep;22(9):1748-57. doi: 10.1681/ASN.2010121302. Epub 2011 Aug 11. PMID: 21836143; PMCID: PMC3171945.
- 5- Parida S, Badhe AS. Cardiac surgery-associated acute kidney injury. *J Anesth.* 2013 Jun;27(3):433-46. doi: 10.1007/s00540-012-1523-2. Epub 2012 Nov 22. PMID: 23179740.