

LETTER

Open Access



Early vs. late coronary angiography in cardiac arrest improves survival and preserves renal function: some confounding factors to consider

Sébastien Redant¹, Yael Langman¹, Xavier Beretta-Piccoli², David De Bels¹, Rachid Attou¹ and Patrick M. Honore^{1*}

Rundgren et al. studied the evolution of renal function in postcardiac arrest as a function of hypothermia and timing of angiography (early vs. late). They have concluded that early coronary angiography (CA) does not increase the risk of developing acute kidney injury (AKI). They also showed a significant difference in survival at 6 months [1]. The authors also noted that lactate at admission was statistically significantly higher in the AKI group [1]. This leads us to question whether these patients had more severe shock or hemodynamic instability and in turn consider whether there was a potential selection bias, with these patients receiving delayed CA due to the need to be stabilized before proceeding. A recent study has shown that an increased number of incompletely revascularized lesions was associated with a greater risk of intra-hospital mortality and poorer neurological outcome in patients after cardiac arrest [2]. The result of the CA and the success of the revascularization procedure should be potential confounders to consider in the AKI risk assessment. It is indeed very elegant to postulate that early CA is accompanied by a recovery of cardiac function that results in improved renal function despite concurrent contrast administration. Renal function strongly depends on renal interstitial pressure and arteriovenous pressure difference. The combination of significant vasodilation from postarrest ischemia-reperfusion with venous congestion, low cardiac output, and activation of a systemic inflammatory response leads to multiple organ dysfunction where AKI is prominent. Increased central venous pressure has been shown to be the most important hemodynamic factor driving

worsening renal function in decompensated patients with advanced heart failure [3]. In septic patients, venous congestion has been associated with an increased likelihood of new or persistent acute kidney injury, particularly when combined with a low diastolic blood pressure, a marker of generalized vasodilatation [4]. We would like to see the objective data regarding cardiac function including pre- and postcoronary angiography. It has also been shown, but in the context of sepsis, that recovery of renal function is inconsistent after normalization of hemodynamics or could take a much longer time to recover [5]. In conclusion, we find this study very interesting in assessing the impact of early vs. late angiography on renal function. Nevertheless, this study lacks to show the input of potential confounders of renal injury such as the severity of the coronary lesions, the level of success of the CA, and more precise hemodynamics data.

Abbreviations

CA: Coronary angiography; AKI: Acute kidney injury

Acknowledgements

None.

Authors' contributions

SR and PMH designed the paper. All authors participated in drafting and reviewing. All authors read and approved the final version of the manuscript.

Funding

None.

Availability of data and materials

Not applicable.

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

* Correspondence: Patrick.Honore@CHU-Brugmann.be

This comment refers to the article available at <https://doi.org/10.1186/s13054-019-2390-0>.

¹ICU Department, Centre Hospitalier Universitaire Brugmann, Brugmann University Hospital, Place Van Gehuchtenplein 4, 1020 Brussels, Belgium
Full list of author information is available at the end of the article



Author details

¹ICU Department, Centre Hospitalier Universitaire Brugmann, Brugmann University Hospital, Place Van Gehuchtenplein 4, 1020 Brussels, Belgium.

²Pediatric Intensive Care Department, Hôpital Universitaire des Enfants Reine Fabiola, Université Libre de Bruxelles, Brussels, Belgium.

Received: 4 November 2019 Accepted: 14 November 2019

Published online: 27 November 2019

References

1. Rundgren M, Ullén S, Morgan MPG, Glover G, Cranshaw J, Al-Subaie N, et al. Renal function after out-of-hospital cardiac arrest; the influence of temperature management and coronary angiography, a post hoc study of the target temperature management trial. *Crit Care*. 2019;23(1):163. <https://doi.org/10.1186/s13054-019-2390-0>.
2. Tsai MS, Sung CW, Chen WJ, Chuang PY, Wang CH, Wu YW, et al. Stenosis and revascularization of the coronary artery are associated with outcomes in presumed cardiogenic arrest survivors: a multi-center retrospective cohort study. *Resuscitation*. 2019;137:52–60. <https://doi.org/10.1016/j.resuscitation.2019.01.040>.
3. Mullens W, Abrahams Z, Francis GS, Sokos G, Taylor DO, Starling RC, et al. Importance of venous congestion for worsening of renal function in advanced decompensated heart failure. *J Am Coll Cardiol*. 2009;53(7):589–96. <https://doi.org/10.1016/j.jacc.2008.05.068>.
4. Legrand M, Dupuis C, Simon C, et al. Association between systemic hemodynamics and septic acute kidney injury in critically ill patients: a retrospective observational study. *Crit Care*. 2013;17:R278.
5. Gattinoni L, Brazzi L, Pelosi P, Latini R, Tognoni G, Pesenti A, et al. A trial of goal-oriented hemodynamic therapy in critically ill patients. SvO2 collaborative group. *N Engl J Med*. 1995;333(16):1025–32. <https://doi.org/10.1056/NEJM199510193331601>.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.