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Prevention of cardiac surgery associated acute kidney injury by a goal-directed perfusion protocol: A propensity-scored analysis

Viachaslau Barodka

Johns Hopkins University, USA

We sought to determine whether a goal-directed perfusion protocol (GDPP) could reduce the incidence of acute kidney injury (AKI) following cardiac surgery. Based on available literature, we identified goals to achieve during cardiopulmonary bypass (including maintenance of oxygen delivery above 300 mL O₂/min/m² body surface area, and reduction in vasopressor use) which were combined into the GDPP. GDPP patients were matched to controls that underwent cardiac surgery between 2010-2015 using propensity scoring across 15 variables. The primary and secondary outcomes were the incidence of AKI and the mean rise in serum creatinine within the first 72 hours following cardiac surgery. We utilized GDPP in 88 patients, and matched these to 88 control patients who were similar across all variables including mean age (61 years in controls vs. 64 in GDPP patients, $p=0.12$) and preoperative glomerular filtration rate (90 vs. 83, $p=0.34$). Controls received more phenylephrine on cardiopulmonary bypass (mean 2.1 vs. 1.4 mg, $p<0.001$) and had lower nadir oxygen delivery (mean 241 vs. 301 mL O₂/min/m², $p<0.001$). The AKI incidence was 23.9% in controls and 9.1% in GDPP patients ($p=0.008$); incidences of AKI stage 1, 2, and 3 were 19.3%, 3.4% and 1.1% in controls, and 5.7%, 3.4%, and 0% in GDPP patients. Control patients exhibited a larger mean percent increase in creatinine from baseline (35% vs. 16%, $p<0.001$). GDPP appears effective in reducing AKI incidence following cardiac surgery. A randomized trial is needed to confirm these findings.

Biography

Viachaslau Barodka has completed his MD at Byelrussian State Medical University in 2000. In 2004, he moved to United States and completed his Residency Training in Anesthesiology at Thomas Jefferson University, Philadelphia, PA. In 2009, after completion of the Cardiothoracic Fellowship at The Johns Hopkins University Hospital, Baltimore, USA, he continued his career as an Assistant Professor of Cardiac Anesthesia. He has special expertise in cardiovascular physiology and outcomes after cardiac surgery. He has 25 publications in high impact peer reviewed journals.

vbarodk1@jhmi.edu

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