

POSTER PRESENTATION

Open Access

Long-term effects of remote ischaemic preconditioning in high risk patients undergoing cardiac surgery: follow-up of a randomised clinical trial

A Zarbock^{1*}, J Kellum², H Van Aken¹, C Schmidt¹, S Martens¹, D Görlich¹, M Meersch¹

From ESICM LIVES 2015

Berlin, Germany. 3-7 October 2015

Introduction

Acute kidney injury (AKI) is a common complication after cardiac surgical procedures and is associated with an increased morbidity and mortality.

Objective

In a multicenter randomized trial, we found that remote ischemic preconditioning (RIPC) reduced acute kidney injury (AKI) in high risk patients undergoing cardiac surgery. We now report on the effects of RIPC on long-term outcomes.

Methods

In this follow up of the RenalRIPC trial, we examined the effect of RIPC the composite end-point of all-cause mortality, need for renal replacement therapy, and persistent renal dysfunction at 90 days (MAKE₉₀). Secondary outcomes were renal recovery and dialysis dependence in patients with AKI.

Results

RIPC significantly reduced the occurrence of MAKE₉₀ (17/120 (14.2%)) compared to the sham group (30/120 (25.0%); ARR, 10.8%, 95% CI 0.9%-20.8%, $P = 0.034$). In the 108/240 patients who developed post-surgery AKI (RIPC 45 (37.5%), Sham-RIPC 63 (52.5%)), 2 (5.3%) in the RIPC group and 11 (22.0%) in the Sham-RIPC did not recovery renal function by 90-days; ARR 16.7%, 95% CI, 3.2%-30.2%, $P = 0.028$) and 1 (2.4%) versus 8 (15.4%) were dialysis dependent; ARR 13.0%, 95% CI, 2.1%-23.8%,

$P = 0.036$). A receiver operating characteristic (ROC) curve analysis for the MAKE₉₀ showed best performance for insulin-like growth factor-binding protein 7 (IGFBP7) and tissue inhibitor of metalloproteinases-2 (TIMP-2) ([TIMP-2]·[IGFBP7]) at 4 h (AUC 0.64; 95% CI 0.547-0.736, $P = 0.004$). The ROC analyses including AKI positive patients showed that [TIMP-2]·[IGFBP7] was predictive at 4h for renal non-recovery (AUC 0.70; 95% CI, 0.587-0.818; $P = 0.021$) and at 12 h (AUC 0.74; 95% CI, 0.604-0.879; $P = 0.006$) after cardiopulmonary bypass. The maximum urinary [TIMP-2]·[IGFBP7] demonstrated an AUC of 0.75 (95% CI, 0.640-0.865; $P = 0.004$). Optimal cut points were determined from the ROC analyses maximizing the Youden Index ([TIMP-2]·[IGFBP7] at 4h = 0.7; [TIMP-2]·[IGFBP7] at 12h = 0.67, [TIMP-2]·[IGFBP7] maximum = 0.86). Sensitivities ranged from 0.50 to 0.55, specificities from 0.75 to 0.82.

Conclusions

RIPC significantly reduced the 3-month incidence of a composite end point of all-cause mortality, need for renal replacement therapy, and persistent renal dysfunction in high risk patients undergoing cardiac surgery. Furthermore, RIPC enhanced renal recovery in patients with AKI.

Trial Registration

The trial is registered at <http://www.drks.de> (Identifier: DRKS00005333).

Authors' details

¹University Hospital Münster, Münster, Germany. ²University of Pittsburgh, Pittsburgh, PA, USA.

¹University Hospital Münster, Münster, Germany
Full list of author information is available at the end of the article

Published: 1 October 2015

doi:10.1186/2197-425X-3-S1-A411

Cite this article as: Zarbock *et al.*: Long-term effects of remote ischaemic preconditioning in high risk patients undergoing cardiac surgery: follow-up of a randomised clinical trial. *Intensive Care Medicine Experimental* 2015 **3**(Suppl 1):A411.

Submit your manuscript to a SpringerOpen[®] journal and benefit from:

- ▶ Convenient online submission
- ▶ Rigorous peer review
- ▶ Immediate publication on acceptance
- ▶ Open access: articles freely available online
- ▶ High visibility within the field
- ▶ Retaining the copyright to your article

Submit your next manuscript at ▶ springeropen.com
