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MEETING ABSTRACT Open Access

Clinical Trial: Heme Arginate in patients planned for Cardiac Surgery (HACS)

Fiona Duthie[1*], Vipin Zamvar[2], Rachel Thomas[1], David Kluth[1], Jeremy Hughes[1]

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Background/Introduction

Acute kidney injury (AKI) is a significant complication of cardiac surgery and is associated with increased morbidity and mortality [1]. Despite much research, there is no specific therapy available. Although AKI can be multifactorial, ischaemia reperfusion injury (IRI) often plays a key role. Thus, cardiac surgery offers an attractive opportunity for translational AKI research given the predictive haemodynamic challenge to renal perfusion.

Hemeoxygenase-1 (HO-1) is a key inducible anti-inflammatory enzyme that catalyses the breakdown of the pro-oxidant protein heme ubiquitously found at inflamed sites. The drug heme arginate has been in use for over 20 years in the treatment of porphyria but also upregulates HO-1 in peripheral blood mononuclear cells (PBMCs) [2] and ameliorates calf muscle ischaemia [3]. In addition, treatment of mice with heme arginate prior to renal IRI strongly upregulates renal HO-1 expression and protects from AKI [4]. We therefore hypothesise that HA may offer a prophylactic therapy for human renal IRI via the upregulation of HO-1.

Aims/Objectives

The HACS Trial aims to determine whether heme arginate will upregulate HO-1 in PBMCs in patients aged 60 or above who are scheduled for cardiac surgery, and to verify its safety in this patient cohort.

Method

20 participants, who are scheduled for elective cardiac surgery, will be randomised to receive 1 mg/kg or 3 mg/kg heme arginate. The primary end point will be the difference in PBMC HO-1 protein from baseline at 24 hours. Secondary end points include HO-1 gene expression, safety and HO-1 genotype.

Results

Results are expected in July 2015. At the time of abstract submission, 14 of 20 participants have been recruited.

Discussion/Conclusion

Data from the HACS trial will inform a subsequent multicentre randomised controlled trial of heme arginate versus placebo in the prevention of AKI in patients deemed to be at higher risk of developing AKI post cardiac surgery

Authors' details
[1]University of Edinburgh/MRC Centre for Inflammation Research, Edinburgh, EH16 4TJ, UK. [2]Department of Cardiothoracic Surgery, Royal Infirmary of Edinburgh, EH16 4SA, UK.

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[1]University of Edinburgh/MRC Centre for Inflammation Research, Edinburgh, EH16 4TJ, UK
Full list of author information is available at the end of the article