

REmote preconditioning for Protection Against Ischaemia–Reperfusion in renal transplantation (REPAIR): a multicentre, multinational, double-blind, factorial designed randomised controlled trial

Raymond MacAllister,^{1*} Tim Clayton,²
Rosemary Knight,² Steven Robertson,²
Jennifer Nicholas,² Madhur Motwani¹
and Kristin Veighey³

¹Division of Medicine, University College London, London, UK

²Clinical Trials Unit, London School of Hygiene and Tropical Medicine,
London, UK

³Portsmouth Hospitals NHS Trust, Portsmouth, UK

*Corresponding author

Declared competing interests of authors: none

Published May 2015

DOI: 10.3310/eme02030

Plain English summary

Protection against ischaemia–reperfusion in renal transplantation

Efficacy and Mechanism Evaluation 2015; Vol. 2: No. 3

DOI: 10.3310/eme02030

NIHR Journals Library www.journalslibrary.nihr.ac.uk

Plain English summary

Kidney transplantation transforms the lives of patients with kidney failure. However, the transplanted kidney has a limited lifespan and many patients eventually have to restart dialysis. The REPAIR trial investigated a method for increasing the lifespan of the transplanted kidney to delay the need to return to dialysis and retransplantation. During a transplant operation the kidney is removed from the donor and implanted in the recipient. During this procedure the blood supply is cut and this causes a degree of damage. In the REPAIR trial a method was investigated to limit the damage caused during the operation, so that the kidney would work better once implanted in the patient. Our research had shown previously that reducing the blood flow to the arm activates a reflex that may make organs more resistant to loss of their blood supply. This procedure is called remote ischaemic preconditioning (RIPC) and the REPAIR trial investigated whether RIPC improved kidney function after transplantation. RIPC was performed by applying a blood pressure cuff around the top of the arm and inflating for 5 minutes and deflating for 5 minutes for four cycles in total.

In total, 406 living-donor kidney transplant patients were recruited from hospitals in the UK and Europe. The results indicated that RIPC had a small but clinically important beneficial effect on some measures of kidney function 1 year after transplantation. We concluded that RIPC was safe and convenient and has little cost and that the boost to kidney function might extend the life of the transplanted kidney.

Efficacy and Mechanism Evaluation

ISSN 2050-4365 (Print)

ISSN 2050-4373 (Online)

This journal is a member of and subscribes to the principles of the Committee on Publication Ethics (COPE) (www.publicationethics.org/).

Editorial contact: nihredit@southampton.ac.uk

The full EME archive is freely available to view online at www.journalslibrary.nihr.ac.uk/eme. Print-on-demand copies can be purchased from the report pages of the NIHR Journals Library website: www.journalslibrary.nihr.ac.uk

Criteria for inclusion in the *Efficacy and Mechanism Evaluation* journal

Reports are published in *Efficacy and Mechanism Evaluation* (EME) if (1) they have resulted from work for the EME programme, and (2) they are of a sufficiently high scientific quality as assessed by the reviewers and editors.

EME programme

The Efficacy and Mechanism Evaluation (EME) programme was set up in 2008 as part of the National Institute for Health Research (NIHR) and the Medical Research Council (MRC) coordinated strategy for clinical trials. The EME programme is broadly aimed at supporting 'science driven' studies with an expectation of substantial health gain and aims to support excellent clinical science with an ultimate view to improving health or patient care.

Its remit includes evaluations of new treatments, including therapeutics (small molecule and biologic), psychological interventions, public health, diagnostics and medical devices. Treatments or interventions intended to prevent disease are also included.

The EME programme supports laboratory based or similar studies that are embedded within the main study if relevant to the remit of the EME programme. Studies that use validated surrogate markers as indicators of health outcome are also considered.

For more information about the EME programme please visit the website: <http://www.nets.nihr.ac.uk/programmes/eme>

This report

The research reported in this issue of the journal was funded by the EME programme as project number 08/52/02. The contractual start date was in July 2009. The final report began editorial review in August 2014 and was accepted for publication in January 2015. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The EME editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report document. However, they do not accept liability for damages or losses arising from material published in this report.

This report presents independent research. The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the NHS, the NIHR, MRC, NETSCC, the EME programme or the Department of Health. If there are verbatim quotations included in this publication the views and opinions expressed by the interviewees are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, NETSCC, the EME programme or the Department of Health.

© Queen's Printer and Controller of HMSO 2015. This work was produced by MacAllister *et al.* under the terms of a commissioning contract issued by the Secretary of State for Health. This issue may be freely reproduced for the purposes of private research and study and extracts (or indeed, the full report) may be included in professional journals provided that suitable acknowledgement is made and the reproduction is not associated with any form of advertising. Applications for commercial reproduction should be addressed to: NIHR Journals Library, National Institute for Health Research, Evaluation, Trials and Studies Coordinating Centre, Alpha House, University of Southampton Science Park, Southampton SO16 7NS, UK.

Published by the NIHR Journals Library (www.journalslibrary.nihr.ac.uk), produced by Prepress Projects Ltd, Perth, Scotland (www.prepress-projects.co.uk).

Efficacy and Mechanism Evaluation Editor-in-Chief

Professor Raj Thakker May Professor of Medicine, Nuffield Department of Medicine, University of Oxford, UK

NIHR Journals Library Editor-in-Chief

Professor Tom Walley Director, NIHR Evaluation, Trials and Studies and Director of the HTA Programme, UK

NIHR Journals Library Editors

Professor Ken Stein Chair of HTA Editorial Board and Professor of Public Health, University of Exeter Medical School, UK

Professor Andree Le May Chair of NIHR Journals Library Editorial Group (EME, HS&DR, PGfAR, PHR journals)

Dr Martin Ashton-Key Consultant in Public Health Medicine/Consultant Advisor, NETSCC, UK

Professor Matthias Beck Chair in Public Sector Management and Subject Leader (Management Group), Queen's University Management School, Queen's University Belfast, UK

Professor Aileen Clarke Professor of Public Health and Health Services Research, Warwick Medical School, University of Warwick, UK

Dr Tessa Crilly Director, Crystal Blue Consulting Ltd, UK

Dr Peter Davidson Director of NETSCC, HTA, UK

Ms Tara Lamont Scientific Advisor, NETSCC, UK

Professor Elaine McColl Director, Newcastle Clinical Trials Unit, Institute of Health and Society, Newcastle University, UK

Professor William McGuire Professor of Child Health, Hull York Medical School, University of York, UK

Professor Geoffrey Meads Professor of Health Sciences Research, Faculty of Education, University of Winchester, UK

Professor John Powell Consultant Clinical Adviser, National Institute for Health and Care Excellence (NICE), UK

Professor James Raftery Professor of Health Technology Assessment, Wessex Institute, Faculty of Medicine, University of Southampton, UK

Dr Rob Riemsma Reviews Manager, Kleijnen Systematic Reviews Ltd, UK

Professor Helen Roberts Professor of Child Health Research, UCL Institute of Child Health, UK

Professor Helen Snooks Professor of Health Services Research, Institute of Life Science, College of Medicine, Swansea University, UK

Please visit the website for a list of members of the NIHR Journals Library Board:
www.journalslibrary.nihr.ac.uk/about/editors

Editorial contact: nihredit@southampton.ac.uk