

Heparin versus citrate anticoagulation for continuous renal replacement therapy in intensive care: the RRAM observational study

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Declared competing interests of authors: Peter J Watkinson was the Chief Medical Officer for Sensyne Health plc (Oxford, UK) and holds shares in the company, and has received grant funding from the National Institute for Health Research (NIHR), Wellcome Trust and Sensyne Health plc outside the submitted work. He was also a member of the NIHR Health Technology Assessment (HTA) European Economic and Social Committee (EESC) Methods Group, NIHR HTA EESC Panel and the NIHR, HTA Programme, Prioritisation Committee and methods group: Hospital based care (B), previously HTA Elective and Emergency Specialist Care Panel (April 2015–November 2019) and NIHR Invention for Innovation Product Development Awards Panel (2018–present). Lui Forni has received grant funding from Baxter International Inc. (Deerfield, IL, USA) outside the submitted work. Fergus Caskey has received honoraria from Baxter International Inc. outside the submitted work. Kathryn M Rowan was a member of the NIHR Health and Social Care Delivery Research Board (2014–19). J Duncan Young was a consultant advisor for the NIHR Efficacy and Mechanism Evaluation (EME) programme and a member of the NIHR EME Funding Committee, NIHR EME Sub-Group Remit Check and NIHR EME Strategy Advisory Committee during the conduct of the study (October 2012–December 2019).

Published February 2022

DOI: 10.3310/ZXHI9396

Plain English summary

The RRAM observational study

Health Technology Assessment 2022; Vol. 26: No. 13

DOI: 10.3310/ZXHI9396

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Plain English summary

Acute kidney injury, which prevents kidneys from working properly, is common in critically ill patients being treated in an intensive care unit. Patients with acute kidney injury are treated with a machine that takes over kidney functions, a process called continuous renal replacement therapy. Traditionally, as part of continuous renal replacement therapy, heparin (an anticoagulant that stops the blood from clotting) is added to the blood as it enters the continuous renal replacement therapy machine. Recently, citrate anticoagulation (an alternative to heparin) has been increasingly used in intensive care units in the UK. However, the increased use of citrate is happening without evidence that this is better for patients and cost-effective for the NHS.

We aimed to find out whether or not changing to citrate anticoagulation for continuous renal replacement therapy is more beneficial than heparin anticoagulation for patients with acute kidney injury treated in an intensive care unit. We also looked at whether or not changing to citrate is cost-effective for the NHS.

We used routinely collected data from the Intensive Care National Audit & Research Centre Case Mix Programme national clinical audit to identify 69,001 patients who received continuous renal replacement therapy in an intensive care unit in England or Wales between 1 April 2009 and 31 March 2017. To get a more comprehensive view of the long-term effects of changing to citrate, we 'linked' data from the 69,001 patients together with other routinely collected data sets to get information on their hospital admissions, longer-term kidney problems and survival after leaving the intensive care unit. We combined this information with a survey of anticoagulant use in intensive care units in England and Wales to compare patients who received continuous renal replacement therapy with heparin and citrate.

We found that the change to citrate was not associated with a significant change in the death rate at 90 days, but that it was more expensive for hospitals.

Our findings suggest that the change to citrate-based anticoagulation may have been premature and should cause clinicians in intensive care units that are still using systemic heparin anticoagulation to pause before making this change.

Health Technology Assessment

ISSN 1366-5278 (Print)

ISSN 2046-4924 (Online)

Impact factor: 4.014

Health Technology Assessment is indexed in MEDLINE, CINAHL, EMBASE, the Cochrane Library and Clarivate Analytics Science Citation Index.

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This report

The research reported in this issue of the journal was funded by the HTA programme as project number 16/111/136. The contractual start date was in April 2018. The draft report began editorial review in February 2020 and was accepted for publication in July 2020. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HTA editors and publisher have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the draft document. However, they do not accept liability for damages or losses arising from material published in this report.

This report presents independent research funded by the National Institute for Health Research (NIHR). 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, NETSCC, the HTA programme or the Department of Health and Social Care. 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 HTA programme or the Department of Health and Social Care.

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