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

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Plain English summary

The RRAM observational study

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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.

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This report

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