

Peer Review

Review of: "Upgrading Renal Replacement Therapy Machines in the ICU: A Comparative Observational Study of Heparin vs. Regional Citrate Anticoagulation"

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I welcome the authors for this work on heparin vs regional citrate anticoagulation.

The research is concise, effective, and clear.

However, there are several shortcomings which I recommend the authors address to improve the generalisability and clarity of this analysis.

First of all,

1. what is a "renal day"? Do you mean the hours patients are on CRRT? It is best to define this explicitly.
2. Confounders. There are multiple confounders which can impact your analysis and which need to be quantified or, if not able to quantify, mention it as limitations
 1. what dosages are you using? e.g., Could it be that the differences are because you are using lower RRT dosages?
 2. whether there has been any change in CRRT machines? e.g., has there been an introduction of new machines? Are you using different or more expensive filter cartridges, etc.?
 3. when using heparin, what is the anticoagulation dosage and targets? Has there been any change in this over the study period?
 4. Can you comment on any complications? e.g., bleeding and thrombosis complications when using heparin and/or citrate-related complications during the study period?

5. Could you comment on the frequency of CRRT changes due to filter clotting?
 6. Has there been a change in transfusion thresholds during the study period?
 7. Please specify when you say blood, do you mean "red blood cells" or "other blood products"?
3. With regards to the benefits of citrate, these are more complex to set up. Could you comment on whether there is additional training or consumables required due to using this mode? You rightly commented on the nursing perspective, which mentions reduced workload but perhaps requires more investment in training and experience to familiarise with the citrate system.
 4. Minor point, but the plot in Figure 1 should be a bar chart, not a line chart. A line chart implies a relationship between "x" variables. Heparin and citrate have no relationship. So please ideally amend to a bar chart. Ideally, include a standard deviation if reporting the mean. Hours in the caption has a close bracket missing. The graph also doesn't make sense; the mean duration of RRT is 101, but the "Average" is 24 and is higher than 101.
 1. Average also implies "mean" or "median," etc., and needs to be specified.
 5. Table 1, row 3; please report the standard deviation if using the mean.
 1. Average to be specified.
 2. Specify how the filter cost per annum is derived.
 6. Please clarify your logic in stating that citrate is more cost-effective. Do you determine this per patient per duration of CRRT received?

Declarations

Potential competing interests: No potential competing interests to declare.