Reviewer's report

Title: Adverse drug events with hyperkalemia during hospitalization: Evaluation of an automated method for retrospective detection in hospital databases

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Reviewer: Shobha Phansalkar

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Adverse drug events with hyperkalemia during hospitalization: Evaluation of an automated method for retrospective detection in hospital databases

The objective of this study is to evaluate an automated method for the retrospective detection of ADEs with hyperkalemia among inpatient stays.

Background:

1. This section seems incomplete with only one line and one reference that too from a study in the US when the current study was conducted in France. Authors are encouraged to draw a stronger background for conducting the study

2. I like how the authors have broken down the background section to highlight the various aspects of why the study is important and what has previously been done

3. PPV stands for Positive Predictive Value

4. Clinico-Biological context is an interesting term and I understand how it is used in this context. Since its use is prevalent throughout the text and because I have not seen it used commonly, at least in the US literature would the authors provide a definition/description of what it means?

5. Sentence construction is awkward. Suggestions and questions are italicized below.

   a. The three main approaches [28] are: “probabilistic approaches”, “expert judgment”, and “algorithm” (what does this mean, building algorithms is not an approach but a means to a computational method?): The probabilistic approach is the most reproducible, though it is not usable on a routine (basis?/computational routine?)

Methods:

1. Data are old, author’s state they were collected in the first nine months of 2010.

2. Why does the formatting vary so much, double spaced in some places and single spaced in others. Consistency throughout the manuscript would be great.

3. (…) "non-steroidal anti-inflammatory" and "high molecular weight heparin" are six drugs retained among rules—some of these are drug classes and not single drugs. I imagine that both generic and brand names were taken into account and that some medication knowledge base was utilized in order to identify synonymy
of medication names/ memberships within classes.

4. In keeping with the comment above, what medication knowledge base was used? Was it a vendor KB or one that the authors build in-house for the purposes of this study?

5. Could the authors comment on the EHR that was being utilized?

6. How was the time period of 5 days chosen for the development of the rule? Expert consensus, if so, please mention this?

7. Would all conditions (causes as the authors call them) have to be fulfilled in the 5 day time period prior to the outcome for the rule to be fulfilled? What if one or more conditions were not met? I see below the authors say 3 conditions but is each “bullet” a separate condition? What is patient were on 2 drugs and was > 70 yrs old?

8. Please revise sentence construction: “Finally, as explained in the objective, it will be precised if the ADEs are serious or not.”

Results:

9. Please revise sentence construction: “very small effective of serious ADEs”. Do the authors mean, “very small incidence”?

10. If the death is the ADE and cannot be directly attributed to the drug then how can we link the cause and the condition? Perhaps precision is even lower than 3.7% for the serious ADEs since out of 3, 2 were deaths that did not have direct causality.

11. How was causality determined for the chart review? Was causality determined using the Naranjo scale?

Discussion:

12. “complex detection rules” has been used—change to have been used.

13. Consider changing word: “Contrariwise,” may be better to use “On the contrary”

14. “usually available a posteriori of the stay” consider changing to “after the stay”

15. The precision of 63% maybe better than then 3 studies that the authors chose to cite but is still not great. This means that 4 out of 10 cases that the system would identify would be false positives. That is a very high false positive rate and may not garner much trust in the system over time. Could the authors comment on this?

16. Could the authors suggest what else could be done to improve performance of a computational approach for detection of hyperkalemia so the precision and recall can be improved?

Level of interest: An article whose findings are important to those with closely related research interests
Quality of written English: Needs some language corrections before being published

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests: None