CRITICAL CARE

LETTER

Concerns regarding use of one-tailed tests in the SLED-BD vs. CVVH trial

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See related research by Schwenger *et al.*, http://ccforum.com/content/16/4/R140

In the previous issue of *Critical Care*, I read with great interest the recent randomized controlled trial comparing sustained low-efficiency dialysis using a single-pass batch dialysis system (SLED-BD) with continuous veno-venous hemofiltration (CVVH) [1]. I congratulate the authors on their undertaking but have serious concerns regarding the majority of their analysis. After each table at the end of the paper, the authors report the use of a 'one-tailed Wilcoxon test' to assess continuous outcomes. I do not believe this use is appropriate.

As the authors themselves remark, this clinical trial represents the first reasonably large trial of SLED-BD versus CVVH. Since this is the case, it is inappropriate to postulate a one-tailed hypothesis for any continuous outcomes. For example, given the available evidence, the possibility of increased intensive care unit stay or ventilator time attributable to SLED-BD cannot be excluded. Thus, a one-tailed hypothesis is not appropriate.

To convert the results reported from using a one-tailed test to those using a two-tailed *P* value, the one-tailed *P* value should be doubled. For example, the *P* value reported in Table 3 for days of mechanical ventilation (one-tailed $P = 0.047$) should be adjusted to a two-tailed *P* value of 0.094. Similarly, all other *P* values obtained by using a 'one-tailed Wilcoxon test' should also be doubled.

Authors' response

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Based on recently reported communications [2,3], our suggestion, at least with respect to costs, practicability, heparin consumption, and bleeding risk, was that the SLED technique is superior to CVVH. This – rather than to test whether SLED is equivalent to CVVH – was the objective of our hypothesis. In consequence of this one-sided question, we strictly used one-tailed statistical tests [1]. However, the tests used were illustrated adequately and a reader has no problem identifying the use of one-sided tests. In addition, the study was not aimed to fit the criteria for an equivalence study. Therefore, to use one-sided tests for several parameters and two-sided tests for others remains arbitrary. Nevertheless, if the reader considers this way of analysis to be inadequate, he can simply double the *P* values in order to support his own assessment of the results.

Abbreviations
CVVH, continuous veno-venous hemofiltration; SLED, sustained low-efficiency dialysis; SLED-BD, sustained low-efficiency dialysis using a single-pass batch dialysis system.

Competing interests
The author declares that he has no competing interests.

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