Letter

Incorrect predictions, not incorrect statistics!

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See related research by Hoff *et al*., http://ccforum.com/content/12/6/R153 and related letter by Dane, http://ccforum.com/content/13/1/402

In a recent study on nurses' ability to predict volume status after subarachnoid haemorrhage, we found very low predictive values [1]. In a letter to the editor, Dane [2] argued that an error in statistics 'makes any reasonable conclusions impossible'. Because Dr Dane was the statistical reviewer of our manuscript, both the authors and the editors were aware of Dane's comments on this issue well before publication.

The substantive point made by Dane is that the standard errors (SEs) estimated in our paper may not be correct. We studied 350 combinations of volume predictions and measurements, obtained in 43 patients with about 170 participating nurses. Therefore, a certain amount of correlation exists, as we explicitly acknowledged in the report. The impact of multiple measurements per patient will be to overestimate, and the impact of multiple measurements per nurse will be to underestimate SEs somewhat. Even if 'within-nurse' correlations were perfect and each nurse made as many as four assessments, the SEs would not increase by more than a factor of two. In any realistic scenario the impact would be much smaller.

More importantly, all results presented in Table 2 of our report and all point estimates of predictive accuracy in Table 3 would remain completely unchanged if the identities of the nurses were recorded and used in analyses. These tables show that the relationship between volume and assessment is weak enough that the precise level of statistical uncertainty in the estimates is beside the point. Dane's statistical arguments are therefore irrelevant to the clinical situation. We maintain our conclusion that nurses' assessment does not adequately predict hypovolaemia or hypervolaemia after subarachnoid haemorrhage.

Competing interests

The authors declare that they have no competing interests.

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References

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2. Dane FC: **Type II errors in 'Nurses' prediction of volume status after aneurysmal subarachnoid hemorrhage: a prospective cohort study'.** *Crit Care* 2009, **13:**402.