Reviewer's report

Title: Controversial significance of early S100B levels after cardiac surgery.

Version: 1 Date: 10 August 2004

Reviewer: Lars S Rasmussen

Reviewer's report:

General
An interesting subject and a reasonable study design

----------------------------------------------------------------------------------

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

Several groups of researchers have studied the possible correlation between S100B and cognitive dysfunction after cardiac surgery but most have not been able to show any significant correlation (Westaby, Diegler, Lloyd). Only in the studies by Wimmer-Greinecker and Herrmann were a significant relationship reported.

It is now realized that S100B is released from extracerebral tissue and in this study, it is attempted to correct for the contamination by assuming that S100B at termination of surgery originates from the surgical field. The elimination of this S100B is then taken into account at the subsequent sampling times. The kinetics were determined in a previous study of 16 patients undergoing different types of cardiac surgery and the retransfused mediastinal blood was assumed to be the only source of S100B.

I am not sure that this calculation is accurate or based on valid assumptions. Why should all S100B origin from the mediastinal blood in the cardiac surgery patients in the kinetics study from 2000? In the present study, it is assumed that S100B at end of surgery originates from the surgical field. The measured concentration of S100B must result from the balance between inflow from the brain and extracranial tissue and on the other hand the continuous breakdown and renal excretion.

Another major problem in this study is the analysis where so many significance tests were performed (for instance 12 tests in table 2 and 22 tests in table 3). This is associated with a large risk of committing a type 1 error. A primary end point should be defined and based on this, a sample size calculation should be presented.

Was informed consent obtained from the patients?

----------------------------------------------------------------------------------

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

It is unclear how the neuropsychological test results were standardised and aggregated to an impairment index.

There seems to be some confusion regarding correlation analysis versus linear regression analysis. Proportions should be reported with 95% confidence interval.

Data that are not Gaussian distributed should not be reported with SD (as an example, table 3, S100B at T0 is 3.63 +/- 2.84).

----------------------------------------------------------------------------------

Discretionary Revisions (which the author can choose to ignore)
What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

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

Declaration of competing interests:

None