Reviewer's report

Title: Structural and cognitive deficits in chronic carbon monoxide intoxication: a voxel-based morphometry study

Version: 2 Date: 27 November 2012

Reviewer: Ralph Benedict

Reviewer's report:

Throughout English grammar is poor and an English writer will need to be consulted.

The Introduction is too long and the logical flow is poor. The 1st paragraph of the Introduction is difficult to follow. In the second paragraph authors state that symptoms cause CNS changes, which does not make sense. The term DNS needs explanation and validation. The author should explain how CO intoxication occurs and how it is measured or verified. The authors refer to subgroups that are not defined. It is never defined how the acute and chronic phases are distinguished.

At one point in time was carboxyhemoglobin level #10%.

The exclusions are too narrow. For example, were developmental disorders excluded?

The distinction between presence or absence of “delayed encephalopathy” is too vague. Moreover, it is a circular rationale as the neuropsychological tests are used to define neuropsychiatric status. I don’t think such arbitrary separation of patients adds value to the manuscript.

The study is in Taiwan where the availability of current neuropsychological tests may be less than ideal. I can accept some uncommon measures. That being said, all tests should be referenced and it should be explained how the tests were translated and if they have been standardized in the native language. Is this the original WAIS from 1955? There are no subtests for the WCST.

I don’t understand why TIV is of interest.

As noted above, it makes sense to use group analysis of patients vs controls, but not the patient subgroups.

For VBM, in addition to correction for education, a formal statistical correction factor is necessary, at least a family wise error correction.

At a minimum, the correlations in Table 3 should employ a more conservative p value for interpretation.

The Discussion should be trimmed by about 35% focusing on the key findings.
that survive the more stringent analyses I have recommended.

**Level of interest:** An article of importance in its field

**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:**

no competing interests