

## **Reviewer's report**

**Title:** A Randomized Trial of the Effects of the Noble Gases Helium and Argon on Neuroprotection in a Rodent Cardiac Arrest Model

**Version: 0 Date:** 28 Dec 2015

**Reviewer:** Kamil Duris

### **Reviewer's report:**

The authors studied the effects of noble gases helium and argon on neurological and histological outcome after resuscitation from cardiac arrest in animal model. The topic of this research is very important and actual (recently was published study (Brücken, A. et al. Delayed argon administration provides robust protection against cardiac arrest-induced neurological damage. *Neurocrit Care* 22, 112-120 (2015) which had a similar design and the authors of presented study compare results in discussion).

Critical issue: Ambiguous results

Both the results of neurological assessment and histology are ambiguous. There was almost none neurological deficit in the study group. The neurological deficit was detectable only on day one after resuscitation, but not beyond this time point. This may suggest that brain ischemia was too mild and thus this study group possibly does not represent clinically relevant situation. The results of histology are also ambiguous. The neuronal damage was detected in the hippocampus and there were no significant differences between "non-treated" and "treated" groups. There was, however tendency to lower numbers of pycnotic cells in "treated" groups. We may again speculate whether the more severe brain ischemia could be associated with the higher contrast between "non-treated" and "treated" groups or not. The amount of used animals is another issue, but this was discussed in the article by the authors themselves.

I am afraid that presented results are not sufficient to conclude whether the use of helium/argon after resuscitation from cardiac arrest may be neuroprotective or not.

**Are the methods appropriate and well described?**

If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**

If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**

If not, please explain in your comments to the authors.

No

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**

If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

**Quality of written English**

Please indicate the quality of language in the manuscript:

Acceptable

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