Reviewer's report

Title: Hyperbaric Oxygen Therapy as an Adjunctive Treatment for Sternal Infection and Osteomyelitis after Sternotomy and Cardiothoracic Surgery

Version: 3 Date: 27 August 2011

Reviewer: Lindell LKW Weaver

Reviewer's report:

Major compulsory revisions

1. Clearly some patients received HBO2 whereas others with sterna infection did not. Please describe why some patients received it and others did not.

2. Although the paper indicates the two groups are comparable, Table 1 suggests that the two groups are different regarding important risk factors for infectious and healing-related outcomes. More patients in the controls had coronary arterial disease, prior myocardial infarction, hyperlipidemia, heart failure, and diabetes. I am concerned that with this relatively small sample size the results shown may have been influenced by these co-morbidities. The authors need to explain. Also, were these co-morbidities present before HBO2, of after?

3. Regarding Table 3.
   a. Is the total operation time, the total time from all surgery? If so, adding the number of surgeries to this table would be helpful. The HBO2 group had a longer hospital length of stay. Was this interval significant? Please comment on why the LOS was longer for the HBO2 group.

4. Table 4
   a. Could not the “HBO2 benefit” be influenced by the fact that the HBO2 group had more debridement surgery? Please comment. The text describes no complications in the HBO2 group, but Table 4 indicated there were complications in the HBO2 group. Please explain.

5. Congestive heart failure should be discussed. Table 1 shows 2 CHF patients in the control group. Evidently no patient in this report exhibited heart failure, but acute lung edema can occur in patients who have coexisting heart failure, and patients similar to those reported could have heart failure, and if exposed to HBO2 could be serious, so the authors should mention this hyperbaric oxygen risk (Weaver, et al CHEST).

6. The Methods need to describe to what chamber pressure the patients were treated.

7. The paper describes this study as retrospective, yet the term “enrolled” is used. I suggest that the word “enrolled” be changed to “selected”, or something similar because the patients reported were not “enrolled.”

8. Please change HBO to HBO2, the UHMS accepted abbreviation.
9. Please specify the specific mechanical ventilator used in the chamber.
10. In the Results, please specify the FiO2 at the time HBO2 was initiated.
11. In the Results please describe the ventilator data of those mechanically ventilated (Vr, Vt, FiO2, PEEP, Ppk)
12. Was sedation necessary during HBO2?
13. Were any patients needing inotropic or pressor support during HBO2?
14. What were the causes of death?

Discussion section:
15. Please reference the comment of the first sentence.
16. Please reference the last complete sentence on page 10, ending in “….bacterial infection.”
17. Please remove the second to the last sentence of the Discussion, “A study with a larger sample……significance.”

Discretionary
The “Hyperbaric Oxygen Therapy Indications, 2008, published by the UHMS might be helpful for the reference list.
I think your sample is too small to be confident that HBO2 reduces bacteremia.

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:
I declare that I have no competing interests.