Reviewer's report

Title: Can Hyperbaric Oxygen be Used to Prevent Deep Infections in Neuro-muscular Scoliosis Surgery?

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Reviewer: Kiyotaka Kohshi

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General comments

1. Authors’ approach to reduce surgical infection using hyperbaric oxygen (HBO) therapy is important in surgical fields managing serious conditions like scoliosis, but their data probably have a few problems. At first, authors did NOT show a “statistically” lower incidence of surgical wound infection in HBO group compared to the control, and hence their data do NOT suggest the effect of HBO therapy for protection of post-surgical infection. If authors’ data include only one case with infection in HBO group or only one case without infection in non-HBO group, their results are completely different and will NOT support the prophylactic effect of HBO therapy. This study is an only their clinical experience which authors performed HBO therapy after surgery.

2. Authors’ approach is interesting but a bit questionable to use HBO therapy prophylactically for control of post-operative infection. Because authors continued HBO therapy for more than 6 weeks (30 sessions) after spinal surgery and their treatment period is too long as a prophylactic procedure. In general, post-surgical infection appears to be a problem within a few weeks after surgery. If surgical wound infection happens during the period of HBO therapy, HBO is a treatment for wound infection NOT a protection of post-surgical infection.

Specific comments and recommendations for revision

1. Abstract: poor written. The purpose of this study is almost acceptable, but is NOT clear based on the published reports. Their preparation in “Subjects and Methods” is NOT clear and readers may feel confused. Subjects are 42 cases not 55 ones, and authors had better present their inclusion criteria in the “Text,” NOT in “Abstract.” “Results” is confused, and authors do NOT show the main result, that is, “statistically” significant reduction or not. In “Conclusion,” HBO therapy after spinal surgery has a possibility to reduce the rate of post-surgical wound infection, but from the authors’ data we do NOT decide whether HBO therapy is effective or not to suppress post-surgical infection.

2. Background: I feel confused its session. HBO therapy has been prophylactically used to reduce osteomyelitis after extraction in patients after radiation therapy, but there are no studies to do HBO therapy prophylactically for surgical wounds. This study is interesting, but it is a bit difficult for readers to understand the purpose in this section.
3. **Methods:** Main point is that there are NO statistical methods to compare treatment results in two groups. Besides, another point is NO presentation concerning treatment group selection. Control group includes cases who did not agree their informed consents or could not receive HBO by means of any problems? If HBO group included non-serious cases mainly, treatment results might have been changed. So authors should perform multivariate analysis to compare risk factors in two groups.

4. **Results:** Authors’ data are simple, but they are incomplete. If infection rates are different in two groups, authors should show any factors affecting the treatment results, such as HBO, origin of scoliosis, fusion levels, other surgical procedures, blood loss, surgical time, and/or age. From the authors’ results, I do NOT have a feeling of whether HBO has prophylactic effects of reducing spinal wound infection on post-surgical cases.

5. **Discussion:** Based on the major problems on “Methods” and “Results,” this section is not meaningful. Authors had better limit to discuss controlling surgical infection, and then add advancing wound healing by HBO.

**Level of interest:** An article of limited interest

**Quality of written English:** Not suitable for publication unless extensively edited

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

The field of this manuscript is one of my specialties, but my interests and researches have no competition with the contents.