**Reviewer's report**

**Title:** Utility of Serum IGF-1 for Diagnosis of Growth Hormone Deficiency Following Traumatic Brain Injury and Sport-related Concussion

**Version:** 0  **Date:** 22 Feb 2018

**Reviewer:** Elena Varlamov

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**Summary**

The authors examined the utility of IGF-1 measurement in patients who sustained traumatic brain injury and sports related concussion and were suspected to have growth hormone deficiency (GHD). The main conclusion was that IGF-1 cannot be used as a screening tool for GHD due to poor performance of the test in this population of patients and that dynamic testing should be used to make this diagnosis.

This is a retrospective, well-designed study. There was no control group due to the study design. Overall, the paper is well written and the data are presented clearly. The authors used appropriate statistical methods and provided a comprehensive discussion of their results. However, there are a few points that need to be clarified or corrected:

1. Line 107 and Line 155. Please explain why you used the same cutoff (peak hGH <5.0 µg/L) for glucagon stimulation test (GST) and insulin tolerance test. According to Endocrine Society guidelines, the appropriate cutoff for GST is 2.5-3 µg/L (1,2). A lower cutoff of 1 µg/L has been recommended in obese patients (3). Using a higher cutoff, especially in obese patients, can lead to overdiagnosis of GHD by GST dynamic testing. Considering that fact that half of your patients underwent GST and their BMI data were not available, the true prevalence of GHD in your patient population might have been over-estimated.
2. In the abstract, you say that 27 patients were confirmed to have GHD (peak hGH < 3 µg/dL). However, in the body of the paper you say that you used a cutoff of 5 to define "confirmed" GHD, and 3 to define "severe" GHD. Please correct the cutoff in the abstract.

3. Please explain why you classified 2 patients who had a peak hGH above the cutoff (5.2 and 5.5 µg/dL) as GHD (according to table 1).

4. Line 154. Please provide the number (or %) of patients who tested positive for GHD separately by ITT and GST

5. Line 168. Baseline IGF-1 was not available in 5 patients. However, table 2 indicates that IGF-1 was not available in 6 patients (IGF-1 data presented for 41 out of 47 patients)

6. Table 1. Please provide statistical significance for group medians.

7. Table 1. Please correct GF-1 to IGF-1

8. Table 1 and Table 2. Please explain why median IGF-1 scores in table 1 and table 2 do not match.

9. Table 1. Please explain why all patients had a negative IGF-1 score, but when grouped into GHD and non-GHD, they had positive IGF-1 z-scores.

References


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.
No

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.
Yes

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