Reviewer’s report

Title: Novel causes and consequences of overtraining syndrome: the EROS-DISRUPTORS study

Version: 0 Date: 14 Jun 2019

Reviewer: Ian Walshe

Reviewer's report:

Dear Authors,

The study aimed to use logistic regression to analyze five modifiable parameters to predict OTS as an outcome. In addition, Multivariate linear regression was used to analyze the impact of OTS on hormonal and immunological parameters as well as body composition and subjective feelings.

This is a very interesting article and the authors should be congratulated on working with a population of this nature in such depth. I do, of course, have some comments.

Introduction

Only 3 reviews have been cited in the introduction (excluding self-citation). You should include more literature from other groups in this section.

Line 71: Maybe add in …Despite the name "overtraining syndrome," referring to excessive exercise training, other modifiable factors may trigger OTS.

Methods

It would be useful to have very brief description of the study procedures, diagnosis of OTS etc. rather than referring your previous work; some articles may require subscription.

Line 105: N=39, is this both OTS and ATL? If so, would it be possible to report the n of each group?

Line 106: Should this be selected rather than elected?
Line 125-127: Can you clarify what you mean by this? It would seem that the study is underpowered.

Results

Without seeing the full methods, it is hard to interpret these results, making it hard for the reader. e.g. line 141-143:

"Carbohydrate intake was found to be an independent trigger of OTS when it was analyzed together with sleep and social patterns with an odds ratio (OR) = 1.61, [confidence limits (CL) = 1.03-2.50] for the risk of developing OTS…"

Were the variables measured before diagnosis of OTS? If so, this would indeed indicate the risk of developing OTS. However, if the variables were assessed after diagnosis of OTS, this could be interpreted as OTS leading to a loss of appetite (reduced CHO intake), impaired sleep and change in other cognitive activity.

Line 166: I think this should refer to body composition rather than body metabolism.

Discussion

You mention that each athlete with OTS exhibited a unique combination of altered markers. While it is important to assess multiple markers, it is also important to note that the thresholds for working and studying activity will differ between athletes. Equally, sleep requirements and dietary requirements will also differ between athletes. It is important to acknowledge that the change in these activities are more important than absolute values.

Line 212-216: You mention changes in behaviors. The methods and results do not reflect that you have assessed changes in behavior.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

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.

Yes

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

Declaration of competing interests  
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare that I have no competing interests

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons
CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal