Reviewer's report

Title: Hormonal aspects of overtraining syndrome: a systematic review

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Reviewer: Ian Walshe

Reviewer's report:

This paper has reviewed the literature on basal endocrine markers and also stimulated hormonal responses in athletes with overtraining syndrome, non-functional overreaching and functional overreaching syndrome. The authors concluded that while no differences in basal endocrine markers are often observed between healthy athletes and those overtrained/overreached, there does appear to be some differences in some hormone responses when stimulated.

I believe this review highlights the fact that there is limited amount of experimental or observational research in this area. Furthermore, this paper also reveals the discrepancy between studies in terms of methodology and choice of endocrine markers to diagnose overtraining/overreaching. While I think this offers a unique insight into the landscape of the literature I do have some comments for review.

General comments:

- There are some inconsistencies with regard to grammar. 'Despite of' and 'Despite' are used interchangeably. While either term is correct use of language, this should be consistent throughout.

- There are some spelling and typographical errors throughout the paper and should be revised.

- The paper refers to a correlation between endocrine responses and overtraining state. Since the authors did not directly correlate markers with any aspect of overtraining state, I would advise on a different choice of word other than 'correlate' to avoid confusion.
Introduction

- The introduction categorises overtraining/overreaching and discusses some diagnostic markers but does not provide a rationale for examining endocrine responses.

- The second paragraph of the introduction needs revising as it appears to be one sentence.

Methods

- The methods describe how search strategies were carried out including search terms and databases used. Have the reference lists of each of the 12 selected papers been considered?

- The quality assessment appears to be quite vague. It would be useful to know how many studies were excluded for each criteria.

Results

- It is not clear what was assessed in the review. A list of sports is provided in the results section, including short distance running; however, paragraph 5 of the discussion section explains that only endurance sports were evaluated in the review. It would be worth explaining each event, volume of training to clarify this.

Discussion

- Paragraph 6 of the discussion section explains that "Basal hormones could potentially be good markers of OTS/NFOR/FOR" however, this contradicts the findings of the review. The sentence should be revised.

- In paragraph 7, cortisol responses show conflicting results (50% tests blunted), however, the conclusions state that responds to stress. While it is inconclusive, this should be stated.
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?
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I am able to assess the statistics

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