Different interpretation of the effect of two different intense training regimens on repeated sprint ability

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TO THE EDITOR: We would like to congratulate Mohr and coworkers (3) for their recent publication. Such high-level studies investigating the effects of different training regimens on muscle and performance adaptations relevant to team sport performance are rare, needed, and appreciated. Like most good studies, it raises additional questions, which we raise below.

One of the most interesting findings was that the Na+/H+ exchanger isoform 1 (NHE1) only increased in the group that performed speed endurance training (SET; the training group that experienced a greater decrease in muscle pH during training). This leads to the hypothesis that a significant accumulation of H+ during training is important for the net synthesis of NHE1. While this is a logical observation, it is possible that these differences may be related to their earlier observation that the training distance performed by SET was approximately twice that performed by the sprint training group (ST). Other adaptations to training have been suggested to be related to training volume (4) and thus differences in training volume may explain the observed differences in the NHE1 response. This raises the question as to why the authors didn’t attempt to match training volumes in their study. Given that it has previously been shown that there is a considerable reduction in the contribution of anaerobic glycolysis to latter sprints (2), it is likely that the authors could have doubled the number of sprints (and therefore matched training volume and time), while maintaining the desired pH differences between the two training programs.

Information regarding training strategies to improve repeated sprint ability is very welcome as it has been shown that team sport athletes are required to perform a number of repeated sprint bouts during a match (6) and that repeated sprint ability is a good predictor of high-intensity performance during a soccer match (5). However, we would like to suggest that it is also possible to come to the opposite conclusion of the authors, i.e., that their results suggest that ST may be preferred over SET to improve the ability to carry out high-intensity intermittent exercise. Unfortunately, very little of the actual results from the repeated sprint test are reported. What is reported is that the ST group had a greater improvement than SET in both single sprint time (5.8% vs. 1.5%) and total time to perform the repeated sprint test (4.3% vs. 2.5%). While only SET were reported to have a decrease in the fatigue index (FI) during the repeated sprint test, we believe that this can probably be explained by our estimations that SET had a much greater FI than ST prior to training, and thus a greater potential for improvement. In addition, it is well known that there is a negative relationship between initial sprint performance and sprint decrement (1). Thus, the greater improvement in initial sprint performance in the ST group may have contributed to their lack of change in FI. While the FI is an interesting measure, it is difficult to interpret when there are concurrent changes in initial sprint performance. Only the actual data can clarify this; however, our calculations suggest that following training, the ST group had a better initial sprint time, a faster total time to perform the repeated sprint test, and probably a similar FI, all of which suggest that, in fact, the ST group had the greater ability to carry out high-intensity intermittent exercise.

We would also like to raise a few minor questions regarding the methodology. From our reading, it appears likely that the recovery between efforts (for both groups) was passive, but this is not stated. This information is important for researchers seeking to replicate the study (and indeed any practitioners seeking to implement the findings). It is also not clear whether all subjects who started the study completed the study (the uneven group numbers raises the possibility that there may have been dropouts). While this information is often omitted from research studies, it is particularly pertinent for training studies where new training measures will be judged on their compliance and potential to cause injuries, in addition to their physiological adaptations.

REFERENCES


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