Last Word on Viewpoint: Sacrificing economy to improve running performance—a reality in the ultramarathon?

G. Y. Millet, M. D. Hoffman, and J. B. Morin

1 Université de Lyon, Saint-Etienne, France; and 2 Department of Veterans Affairs, Northern California Health Care System and University of California Davis Medical Center, Sacramento, California

DIFFERENT TYPES OF ULTRAMARATHONS

We fully agree that the number of runners at the elite level is lower in ultramarathons than shorter distances. There is also no doubt that ultramarathon running is not as universal as running of “normal” distances, i.e., up to the marathon. In particular, African runners are not represented. This may explain part of the specificities of ultramarathon runners, such as a more variable body mass index in the best ultramarathon runners compared with “elite” marathon or 10-km runners (1).

Still, there are certain characteristics of ultraendurance running that are specific to extreme distances from a physiological and mechanical point of view (4). This makes the question of lower limb damage relevant, not only for health problem (e.g., acute kidney injury) but also for performance as we argued in our Viewpoint (4). In fact, we anticipated that certain equipment/running patterns/training strategies that actually increase Cr may be more than offset through gains in endurance in ultramarathon running, and such a balance is essential for performance optimization. Importantly, most of the comments (see Ref. 6) focus on elite athletes, but one should consider performance across the full spectrum of runners rather than just the fastest. Indeed, performance level will likely affect the optimal balance of Cr and endurance (e.g., use of poles).

The term “ultramarathon” refers to a wide range of events, and it was not possible to provide details about the various events in a Viewpoint article. Ultramarathons are basically either performed on mostly flat roads or tracks or run on varied terrain trails and can involve distances from 50 km to those covered in multiple days. It is likely that our arguments apply differently depending on the event distance, i.e., the closer the distance to the marathon (50 km), the less relevant are our arguments.

There is little doubt that severe muscle fiber damage occurs in well-trained ultramarathon runners. It is not uncommon for top-10 finishers in a 161-km trail ultramarathon event to have values over 20,000 U/l (2). As such, there is clearly evidence of considerable muscle damage even among the most competitive runners. Although we acknowledge that improving running economy may help minimize damage through reduction in oxidative stress, mechanical damage likely plays a major role.

It has been suggested that modifications in running pattern could be due to fatigue (strength loss) rather than a way to protect the runner. In a recent study, we showed that high-intensity fatigue does not induce changes in the constant velocity running pattern at low or high velocity, so changes in running patterns after ultramarathons are likely due to the necessity for subjects to adopt a protective pattern (5).

Thus we still believe that sacrificing economy to improve running performance can be a reality in the ultramarathon. We acknowledge that not all of our assertions are directly supported by science dedicated to ultramarathon running because some are based on scientific data from other types of exercise, but we hope that this discussion will trigger future research on extreme duration exercise.

DISCLOSURES

No conflicts of interest, financial or otherwise, are declared by the authors.

AUTHOR CONTRIBUTIONS

Author contributions: G.Y.M. drafted manuscript; G.Y.M., M.D.H., and J.-B.M. edited and revised manuscript; G.Y.M., M.D.H., and J.-B.M. approved final version of manuscript.

REFERENCES