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Response

Ryan M. Broxterman, Gwenael Layec, Thomas J. Hurea, David E. Morgan, Amber D. Bledsoe, Jacob E. Jessop, Markus Amann, and Russell S. Richardson

University of Utah, Salt Lake City, UT

Dear Editor-in-Chief,

We thank the authors (1) for their interest in our work (2) and take this opportunity to address, once more, their continued concerns regarding the role of group III/IV muscle afferent feedback in the perception of exertion during exercise. Among other results on muscle bioenergetics, our recent article provides evidence that pharmacological attenuation of group III/IV leg muscle afferent feedback greatly reduced the rating of perceived exertion during maximal single joint exercise (2). The authors raise concerns regarding the assessment of perceived exertion and the role of group III/IV muscle afferents in nociception, in addition to suggesting both corollary discharge and muscle afferent feedback influence the perception of exertion during exercise.

To address the first concern, we agree that appropriate assessment of perceived exertion during exercise is crucial. Indeed, while strictly following the guidelines set by Borg, we specifically obtained ratings of perceived exertion using the Borg modified CR10 (3). We therefore emphasize that perceived exertion was appropriately assessed in our study.

The second concern raised is that group III/IV muscle afferents are involved in nociception. We recognize that intrathecal fentanyl simultaneously attenuates both nociceptive and non-nociceptive group III/IV muscle afferents (4–6). Thus, a nociceptive role of group III/IV muscle afferent feedback may have influenced the perception of exertion in our study (2). However, as recognized by Borg, perceived exertion is influenced by many factors (3). Therefore, the conclusion that group III/IV muscle afferent feedback influences the perception of exertion during exercise still stands.

In terms of the third concern, we agree that the perception of exertion during exercise is likely determined by both muscle afferent feedback and corollary discharge (7). However, it is important to emphasize that the conclusion in our recent publication (2) was not that group III/IV muscle afferent feedback is the sole determinant of the perception of exertion during exercise. Rather, we suggest that mounting evidence supports that group III/IV muscle afferents influence, or contribute to, the perception of exertion during exercise, likely in addition to corollary discharge (2, 7, 8).

Finally, this letter to the editor was solely focused on the perception of exertion during exercise, which was a relatively minor component of a rather complex and integrative physiological investigation into the role of group III/IV muscle afferents in the bioenergetics of exercising skeletal muscle (2). Nonetheless, we maintain that our study does provide insight into the determinants of the perception of exertion during exercise, due to appropriate

assessment methods and an integrative framework. Therefore, to summarize, in our study (2), despite performing a *maximal* exercise protocol, the *perception* of exertion was greatly reduced when feedback from group III/IV muscle afferents was attenuated. Thus, the notion of a crucial role of group III/IV muscle afferent feedback in the perception of exertion during exercise appears to be substantiated.

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