Last Word on Point: Counterpoint: The lactate paradox does/not occur during exercise at high altitude

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To the Editor: The black and white format of the “The lactate paradox does/not occur during exercise at high altitude” is excellent for a sharp debate. I brought forward a number of studies that could not find the phenomenon and critically looked at studies that did observe the lactate paradox, providing evidence for serious doubt for the lactate paradox to exist. Looking at the comments to the debate, the conclusion is that I have succeeded. However, I am the first to acknowledge that the overall conclusion of this debate cannot be black and white because neither the point nor counterpoint part of the debate can come forward with plausible explanations of why some find the lactate paradox phenomenon and others do not. Therefore, the constructive comments from Secher and Rasmussen, Kayser, Samaja, and Grassi and Gladden (2) to this debate are much appreciated, as they contain suggestions of why discrepancies in observations might exist. All suggestions put forward by these authors are well taken and hopefully may lead to consensus of how to conduct studies dealing with the lactate paradox phenomenon. Still, in my opinion, the importance will not to be to answer the purely academic question “does the lactate paradox exist?” but to find the underlying mechanisms of the potential adaptation(s) in energy metabolism under chronic hypoxic condition.

My apologies to Professor Mazzeo for some inaccuracies and referring to a paper that contained norepinephrine instead of epinephrine data (1). At the same time I would like to point out some inaccuracy and suggestive nature of his comments. First, in our study (3), subjects lost 7.3 kg body mass, not lean body mass, and thus by no means lost 7.3 kg of muscle, but as mentioned in the paper they lost 9% of upper leg muscle mass over 9 wk. Second, the suggested effect of muscle mass loss on lactate production is speculative. Third, in our second study (4,100 m El Alto, Bolivia), subjects lost neither body nor muscle mass; however, no lactate paradox phenomenon was observed. Fourth, many subjects of high-altitude studies suffer from body mass loss and those that do report body mass maintenance with acclimatization do not provide data on muscle mass maintenance, which makes this a potential confounder in all studies and not specific for one particular study.

REFERENCES