Letters to the Editor

Aftereffects of Exercise

To the editor:

We read with interest the report by Cleroux and colleagues on the hemodynamic aftereffects of exercise in the February issue. They are wrong to state that no study has looked simultaneously at spillover and clearance studies would be necessary to conclude comprehensive methods such as organ-specific norepinephrine estimations. Because it is known that after the cessation of exercise there is a sudden increase in renal blood flow that would increase plasma norepinephrine clearance and lead to a reduction in plasma levels independently of any true change in norepinephrine release. More comprehensive methods such as organ-specific norepinephrine spillover and clearance studies would be necessary to conclude anything about regional and systemic sympathetic activity from norepinephrine estimations.

Thus, we commend Cleroux and colleagues for reporting on this interesting area of integrated physiology but would warn against drawing premature conclusions.

References


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The following is in response:

To the editor:

We are grateful to Drs. Coats and Piepoli for pointing out an earlier study that had unwittingly escaped our attention and for mentioning unpublished data supporting our observation that forearm vascular resistance was unchanged in normotensive subjects after they had performed cycling exercise at 50% of maximal aerobic capacity. In our view, it remains all the more interesting that hypertensive subjects exercising at the same relative (percentage of maximal aerobic capacity) and absolute (Watts) intensity exhibited strikingly different postexercise hemodynamic responses.

Their comment on sympathetic nervous activity is well taken. In our article, we recognized that the evidence linking the finding of a reduced muscle sympathetic nervous activity after exercise in hypertensive subjects with our observation of reduced forearm vascular resistance and plasma norepinephrine is valid to the extent that the relations between sympathetic nervous activity and plasma norepinephrine also hold after exercise when the leg has been active and the forearm has not. This important limitation could prove them right in that it may be "misleading to extrapolate from what is happening to localized sympathetic nerve traffic in the leg to the state of sympathetic activity to other organs..."; for the time being, we note that Drs. Coats and Piepoli revise their earlier conclusion that "postexercise hypotension seems associated with persistent sympathetic discharge and reduced vagal activity on the cardiovascular system" and now state that "...for cardiac sympathetic activity at least, sympathetic tone is persistently elevated rather than reduced after exercise." In closing, we are well aware that plasma norepinephrine may be subject to criticism as an index of sympathetic nervous activity. However, the suggestion that an increased clearance of norepinephrine due to an increased renal blood flow after exercise may contribute importantly to changes in plasma levels does not find...
strong support in the literature. Indeed, plasma norepinephrine clearance does not decrease during exercise when renal blood flow is reduced nor is its half-life different during recovery compared with rest. This suggests that changes in plasma levels are more likely to be due to changes in norepinephrine release. Drs. Coats and Piepoli discuss their data on sympathetic tone assessed with power spectral analysis. It may be worth mentioning that with this approach, Arai et al. reported that sympathetic activity to the heart was reduced below baseline levels after a maximal exercise protocol similar to the one used by Piepoli et al., i.e., in direct contradiction with the conclusion of the latter authors, although a persistent tachycardia was observed in both studies.

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