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Commentary on “Time to Reconsider How Ventilation is Regulated above the Respiratory Compensation Point during Incremental Exercise”

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TO THE EDITOR:

In their interesting viewpoint, Nicolò and colleagues (4) suggested that the central command contributes more than metabolic acidosis on the non-linear response of minute ventilation ($\dot{V}E$) above the respiratory compensation point. To support their hypothesis, a list of studies showing *indirect* evidences of central command was provided. However, some methodological limitations should be considered. In the specific, the studies provided involved experimental manipulation or conditions that induced systemic effects, by therefore involving multiple systems responsible on regulation of $\dot{V}E$ during exercise. Moreover, these studies did not specifically manipulate or monitored central command activity.

There is the possibility to *isolate* and *quantify* the contribution of central command by means of non-invasive brain stimulation techniques. The possibility to specifically target and manipulate the activity of cortical areas in a controlled manner could provide a more sophisticated methodological approach. Neurophysiological studies demonstrated a relationship between the activity of pre-motor and motor areas and ventilatory drive (5). The activity of the same cortical areas has been shown to reflect the magnitude of central motor command and perception of effort (2). In support, recent studies reported a sustained changes in the in $\dot{V}E$ during inspiratory threshold loading following repetitive transcranial magnetic stimulation (3) and changes in perception of effort following transcranial direct current stimulation (1). These studies might provide preliminary evidences on the relationship between $\dot{V}E$ regulation and central motor command. Further studies in this field are required to elucidate the contribution of central command on $\dot{V}E$ during exercise.

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