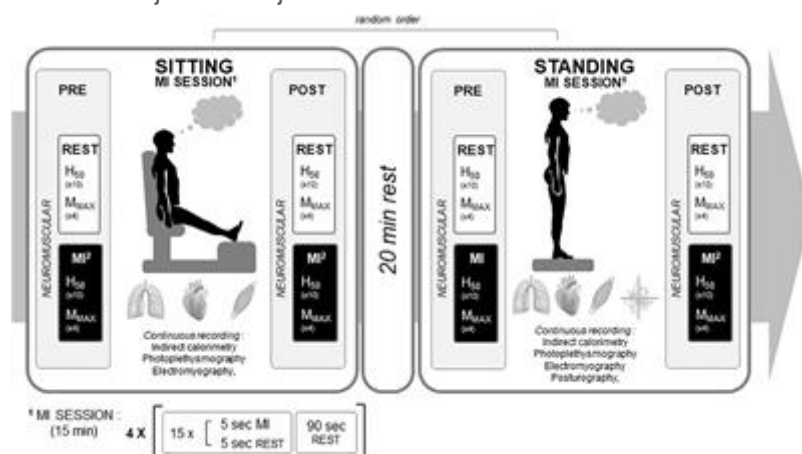


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Motor imagery (MI) for health and performance strategies has gained interest in recent decades. Nevertheless, there are still no studies that have comprehensively investigated the physiological responses during MI, and no one questions the influence of low-level contraction on these responses. Thus, the aim of the present study was to investigate the neuromuscular, autonomic nervous system (ANS), and cardiometabolic changes associated with an acute bout of MI practice in sitting

and standing condition. Twelve young healthy males (26.3 ± 4.4 years) participated in two experimental sessions (control vs. MI) consisting of two postural conditions (sitting vs. standing). ANS, hemodynamic and respiratory parameters, body sway parameters, and electromyography activity were continuously recorded, while neuromuscular parameters were recorded on the right triceps surae muscles before and after performing the postural conditions. While MI showed no effect on ANS, the standing posture increased the indices of sympathetic system activity and decreased those of the parasympathetic system (p

< 0.05). Moreover, MI during standing induced greater spinal excitability compared to sitting posture ($p < 0.05$), which was accompanied with greater oxygen consumption, energy expenditure, ventilation, and lower cardiac output ($p < 0.05$). Asking individuals to perform MI of an isometric contraction while standing allows them to mentally focus on the motor command, not challenge balance, and produce specific cardiometabolic responses. Therefore, these results provide further evidence of posture and MI-related modulation of spinal excitability with additional autonomic and cardiometabolic responses in healthy young men.

<https://www.frontiersin.org/articles/10.3389/fphys.2021.762452/full>(<https://www.frontiersin.org/articles/10.3389/fphys.2021.762452/full>)

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