

Effect of moderate-intensity exercise, whole-body periodic acceleration, and passive cycling on nitric oxide release into circulation.

中等強度運動的作用，全身周期性加速度，以及一氧化氮釋放到循環中的被動循環。

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Study objective: To determine if a 3-min bout of moderately intensive supine bicycle exercise, whole-body periodic acceleration (pGz), and passive motorized cycling cause nitric oxide (NO) release into the circulation, as detected by dicrotic notch descent on the diastolic limb of a finger pulse wave.

Participants: Fourteen healthy adults underwent two levels of supine bicycle ergometry that caused heart rate to rise to 56% (light moderate exercise) and 67% (heavy moderate exercise) of maximum predicted heart rate, and a single bout of pGz. Several months later, 9 of the 14 subjects underwent passive motorized cycling.

Methods: The ECG and finger pulse wave were recorded. The dicrotic notch position was computed from the amplitude of the digital pulse wave (a) divided by the height of the dicrotic notch above the end-diastolic level (b) and designated the a/b ratio. Increase of the a/b ratio due to dicrotic notch descent reflects the vasodilator action of NO on resistance vessels. The last 30 s of baseline, exercise or pGz, and recovery periods were analyzed.

Results: Compared to baseline, light moderate exercise produced a nonsignificant rise of the a/b ratio. Both heavy moderate exercise and pGz produced statistically significant rises of peak and mean a/b ratios over baseline. Heavy moderate exercise produced a greater mean a/b ratio than pGz, but the peak a/b ratio did not differ between the two. Episodic rises and falls of a/b ratios were more common during pGz than exercise. Passive motorized cycling did not alter the a/b ratio.

Conclusions: Dicrotic notch descent occurs during a brief bout of moderate cycling exercise, consistent with NO release into circulation. PGz produces comparable descent, but passive motorized cycling does not. In terms of the beneficial effects of NO, this suggests that pGz might serve as a substitute in subjects who are physically incapable of exercising.

結論：動脈切跡下降發生在中度自行車運動比賽期間，與一氧化氮釋放到循環中一致。周期性加速度(pGz)產生相對的下降，但被動式馬達驅動自行車卻沒有。根據一氧化氮的有利作用，建議周期性加速度(pGz)可以當作無法運動的人的替代方式。