

Nitric oxide is released into circulation with whole-body, periodic acceleration.

一氧化氮以全身周期性加速度釋放到循環中

Sackner MA, Gummels E, Adams JA.

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Study objective: To determine if comfortably applied, whole-body, periodic acceleration releases significant amounts of nitric oxide (NO) into the circulation of healthy subjects and patients with inflammatory diseases.

Materials: Fourteen healthy adults and 40 adult patients with inflammatory diseases underwent single 45-min trials of whole-body, periodic acceleration with a new “passive exercise” device, while an ECG and a digital pulse wave were obtained with a photoelectric-plethysmograph sensor.

Methods: The position of the dicrotic notch from the pulse waveform was computed from the amplitude of the pulse divided by the height of the dicrotic notch above the end-diastolic level (a/b ratio). Increase of the a/b ratio reflects the vasodilator action of NO that causes downward movement of the dicrotic notch in the diastolic limb of the digital pulse, thereby elevating the a/b ratio.

Results: Application of whole-body, periodic acceleration was well tolerated in all participants, and all completed the 45-min treatment. The peak value of the a/b ratio markedly rose during periodic acceleration and returned to baseline during a 5-min recovery period in all healthy subjects and patients with inflammatory diseases.

Conclusions: Whole-body, periodic acceleration increased pulsatile shear stress to the endothelium leading to vasodilatation and a fall in the dicrotic notch, consistent with increased NO bioactivity in every healthy adult and adult patient with inflammatory disease so treated. Therefore, passive exercise using whole-body, periodic acceleration produces an important benefit that occurs with active exercise.

結論: 全身周期性加速度增加脈搏抗剪應力到血管內皮中，並且降低動脈切跡，與在每個健康成人及有發炎疾病病人身上，增加一氧化氮生物活性是一致的。因此，使用全身周期性加速度的被動式運動，製造出一種與主動式運動一樣的重要福祉。