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論 文 の 欧 文 要 旨

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(Title)

Effects of ventricular-arterial coupling on maximal oxygen uptake in endurance athletes
-roles of the left ventricle, central arteries, and peripheral arteries-

(Abstract)

Endurance athletes show high left ventricular function and arterial distensibility. The left ventricular and central and peripheral artery are thus interrelated (ventricular-arterial coupling) and play important roles in determining maximal aerobic capacity such as maximal oxygen uptake. However, the role of central and peripheral arteries and left ventricular diastolic function in determining maximal oxygen uptake is unknown. The aim of the present study was to investigate the impacts of left ventricular function (systolic and diastolic) and arterial function (central and peripheral) on maximal oxygen uptake.

The summary of the results was as follows. First, central and peripheral arterial stiffness was lower in endurance athletes than in non-athletes. In addition, central and peripheral arterial stiffness was associated with maximal oxygen uptake in athletes, but not in non-athletes. Second, central arterial stiffness in endurance athletes was associated with left ventricular systolic (ejection fraction, fractional shortening and stroke volume) and diastolic (E-wave, E-wave/A-wave and e') functions. However, central arterial stiffness in non-athletes was not associated with left ventricular systolic or diastolic function. Third, peripheral arterial stiffness in endurance athletes was associated with left ventricular systolic function (stroke volume) and diastolic (E-wave). However, peripheral arterial stiffness in non-athletes was not associated with left ventricular systolic and diastolic function.

These results revealed that peripheral arterial and left ventricular diastolic functions, not only central arterial and left ventricular systolic functions, contributed to the determination of maximal oxygen uptake in endurance athletes. These results suggest that ventricular-arterial coupling plays an important role in determining maximal oxygen uptake in endurance athletes.