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Validation of FRIEND and ACSM equations for cardiorespiratory fitness: Comparison to direct measurement in male CAD patients.

Cardiorespiratory Fitness (CRF) is associated with a high risk of cardiovascular disease and all-cause mortality. The regression equation of American College of Sports Medicine (ACSM) was a preferred method for estimating maximal oxygen consumption (Peak VO₂). It is well-known that CRF is overestimated in ACSM equation. Recently, Kokkinos et al. reported more precise equation from the Fitness Registry and the Importance of Exercise National Database (FRIEND). We compared Peak VO₂ estimated by ACSM and FRIEND equations to Peak VO₂ directly measured in male coronary artery disease (CAD) patients. We analyzed 103 male CAD patients who underwent percutaneous coronary intervention and who participated in cardiac rehabilitation between June 2015 and December 2018. Peak VO₂ was directly measured by the gas exchange analysis during treadmill test with modified Bruce protocol. Smaller CRF difference was shown in FRIEND equation than the one of ACSM equation. Compared to the directly measured value, CRF estimated by ACSM equation was overestimated by 22%, but the one estimated by FRIEND equation had only 2% gap.