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## The Effect of Diabetes Mellitus and Revascularization Status on Cardiorespiratory Fitness in Multi-vessel Acute Coronary Syndrome Patients

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### Abstract

Background:

The implication of diabetes mellitus (DM) and revascularization status on cardiorespiratory fitness (CRF) in multi-vessel acute coronary syndrome (ACS) is not well established.

Methods:

Between December 2016 and December 2020, ACS patients underwent percutaneous coronary intervention (PCI) with stent implantation and completed a cardiopulmonary exercise test (CPET) were enrolled. Patients were divided into two groups according to the presence of DM. They were further analyzed by the revascularization status: complete revascularization (CR) vs. incomplete CR (ICR). Primary endpoint was CRF defined by peak oxygen uptake at one-year CPET. Secondary endpoints were major adverse cardiac events (a composite of cardiac death, MI, repeat coronary revascularization).

Results:

Among 82 patients who fulfilled enrollment criteria (59.7±8.5 years old, female gender 17.1%), 21 patients were in DM group and 61 patients were in non-DM group. In overall population, CRF was superior in patients with CR compared to the patients with ICR (25.9±3.7 vs. 22.8±4.0 ml/min/kg, p=0.029). The superior CRF by achieving CR was consistent in non-DM patients (26.1 ± 4.2 vs. 23.7 ± 4.0 ml/min/kg, p=0.036). However, the positive effect of CR was blunted in DM patients (25.2 ± 2.3 vs. 24.0 ± 4.4 ml/min/kg, p=0.506). Clinical outcomes were not significantly different between groups during median follow up of 703 days (all events not significant).

Conclusions:

In non-DM multi-vessel ACS patients, CR at the index procedure was related with superior CRF at one-year. Insulin resistance and microvascular dysfunction in DM patients blunted positive effect of CR.

**Keywords:** Keywords: Acute coronary syndrome; diabetes mellitus; complete revascularization; cardiopulmonary exercise test; cardiorespiratory fitness

**Abbreviations:**

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