Prognostic value of preprocedural pericoronary adipose tissue CT-Attenuation in patients with non ST-elevation acute coronary syndrome

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Background: Pericoronary adipose tissue attenuation expressed by fat attenuation index (FAI) on coronary CT angiography (CCTA) reflects pericoronary inflammation. FAI has been reported to be associated with cardiac mortality in patients with suspected coronary artery disease. However, the prognostic value of FAI in patients with non ST-elevation acute coronary syndrome (NSTE-ACS) after percutaneous coronary intervention (PCI) remains elusive.

Methods: This retrospective single-center observational study included a total of 358 patients with NSTE-ACS who underwent preprocedural 320-slice CCTA and emergent PCI within 24 hours from admission. Perivascular fat attenuation mapping was done around the three major coronary arteries—the proximal (4cm) right coronary artery (RCA), the left anterior descending artery (LAD), and the left circumflex artery (LCx). We assessed the prognostic value of FAI for all-cause and cardiac mortality. Clinical outcomes were assessed by death and cardiac death.

Results: During a median follow-up period of 1715 days (1008-2538), death and cardiac death occurred in 36 (10.1%) patients and 18 (5.0%) patients, respectively. High FAI values around LAD and LCx (but not around RCA) were predictive of all-cause mortality. High FAI values around RCA, LAD, and LCx were predictive of cardiac mortality. FAI in culprit vessels and average FAI values in three vessels were predictive of all-cause and cardiac mortality. ROC analysis revealed that the best cut-off FAI value in three vessels for predicting cardiac death is -65.8 (AUC: 0.752, 0.637-0.867.) Kaplan-Meier analysis revealed that patients with average FAI values in three vessels >-65.8 were significantly associated with poor prognosis of cardiac mortality. (P<0.001).

Conclusion: High perivascular FAI values are an indicator of increased cardiac mortality and, therefore, could guide early targeted secondary prevention and intensive medical management in patients with NSTE-ACS after PCI.