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Clinical and hemodynamic determinants of coronary flow reserve in non-obstructed coronary arteries - A patient level pooled analysis of the DEBATE and ILIAS studies

V.E. Stegehuis[1], G.W.M. Wijntjens[1], M. Bax[2], M. Meuwissen[3], S.A.J. Chamuleau[4], M. Voskuil[4], C. Di Mario[5], C. Vrints[6], M. Haude[7], H. Boersma[8], P.W. Serruys[9], J.J. Piek[1], T.P. Van De Hoef[1]

[1]Academic Medical Center of Amsterdam, Heart Center, Amsterdam, Netherlands (The); [2]Hagaziekenhuis, Cardiology, Den Haag, Netherlands (The); [3]Amphia Hospital, Cardiology, Breda, Netherlands (The); [4]University Medical Center Utrecht, Cardiology, Utrecht, Netherlands (The); [5]Careggi University Hospital (AOUC), Cardiology, Florence, Italy; [6]University of Antwerp, Cardiology, Antwerp, Belgium; [7]Lukas Hospital GmbH, Cardiology, Neuss, Germany; [8]Erasmus Medical Center, Cardiology, Rotterdam, Netherlands (The); [9]Imperial College London, Cardiology, London, United Kingdom

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Aim: Coronary Flow Reserve (CFR) is a valuable physiological index for the assessment of myocardial flow impairment due to focal or microcirculatory coronary artery disease (CAD). Coronary flow capacity (CFC) is another flow-based concept in diagnosing ischemic heart disease (IHD), based on hyperemic average peak velocity (hAPV) and CFR. We evaluated clinical and hemodynamic factors which potentially influence CFR and CFC in non-obstructed coronary arteries.

Methods: We analysed CFR and CFC of 396 non-obstructed vessels of patients from two large multi-center trials (DEBATE and ILIAS) with stable CAD who were scheduled for percutaneous coronary intervention (PCI). Doppler flow measurements were performed after inducing hyperemia with either intracoronary or intravenous infusion of adenosine.

Results: Akaike's Information Criterion (AIC) revealed the parameters age, female gender, a history of myocardial infarction, hypercholesterolemia, current or previous smoking and rate pressure product (RPP) as independent predictors in the best model of fit for CFR in an angiographically non-obstructed vessel. After multivariate regression analysis age, female gender and RPP remained as determinants of CFR in angiographically non-obstructed vessels. Subsequently, ordered logistic regression analysis revealed that age is associated with a worse CFC.

Conclusion: Clinical and hemodynamic parameters are associated with CFR and to a lesser extent CFC in an angiographically non-obstructed coronary artery. CFC is less sensitive to variations in clinical and hemodynamic parameters than CFR and therefore a promising tool in contemporary clinical decision making in the cardiac catheterization laboratory.