Relation of coronary flow pattern to myocardial blush grade in patients with first acute myocardial infarction

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BACKGROUND: Analysis of myocardial blush grade (MBG) and coronary flow velocity pattern has been used to obtain direct or indirect information about microvascular damage and reperfusion injury after percutaneous transluminal coronary angiography for acute myocardial infarction. OBJECTIVE: To evaluate the relation between coronary blood flow velocity pattern and MBG immediately after angioplasty plus stenting for acute myocardial infarction. DESIGN: The coronary blood flow velocity pattern in the infarct related artery was determined immediately after angioplasty in 35 patients with their first acute myocardial infarct using a Doppler guide wire. Measurements were related to MBG as a direct index of microvascular function in the infarct zone. RESULTS: Coronary flow velocity patterns were different between patients with absent myocardial blush (n = 14), reduced blush (n = 7), or normal blush (n = 14). The following variables (mean (SD)) differed significantly between the three groups: systolic peak flow velocity (cm/s): absent blush 10.9 (4.2), reduced blush 14.2 (6.4), normal blush 19.2 (11.2); p = 0.036; diastolic deceleration rate (ms): absent blush 103 (58), reduced blush 80 (65), normal blush 50 (19); p = 0.025; and diastolic-systolic velocity ratio: absent blush 4.06 (2.18), reduced blush 2.02 (0.55), normal blush 1.88 (1.03); p = 0.002. In a multivariate analysis MBG was the only variable with a significant impact on the diastolic deceleration rate (p = 0.034,) while age, infarct location, time to revascularisation, infarct vessel diameter, and maximum creatine kinase had no significant impact. CONCLUSIONS: The coronary flow velocity pattern in the infarct related epicardial artery is primarily determined by the microvascular function of the dependent myocardium, as reflected by MBG.

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