ANGIOGRAPHIC PARAMETERS THAT PREDICT THE FUNCTIONAL SIGNIFICANCE OF CORONARY ARTERY STENOSES ASSESSED BY FRACTIONAL FLOW RESERVE

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Background: Fractional flow reserve (FFR) is a validated index of the physiological significance of coronary stenoses, and the FAME trial confirmed superiority over angiography. However, FFR measurement is invasive, not universally available, and adds time and costs to angiography. We sought to identify clinical and angiographic parameters that may help to better predict a lesion’s functional significance.

Methods: We retrospectively evaluated 100 patients who underwent coronary angiography with FFR assessment for intermediate lesions. We compared 50 patients with FFR>0.8 to 50 patients with FFR≤0.8 and recorded differences in clinical, laboratory and angiographic parameters [visual percent diameter stenosis, haziness, ACC/AHA lesion characteristics, TIMI frame count, myocardial jeopardy index (MJI), and quantitative coronary angiographic (QCA) measurements of minimal luminal diameter (MLD), reference vessel diameter (RVD), percent diameter and area stenoses (%DS, %AS), and lesion length].

Results: Several baseline and angiographic parameters were different between the groups. FFR was ≤0.80 in all lesions with MLD <1.32mm (0/50 vs. 22/50, p<0.0001), or QCA %DS >55% (0/50 vs. 27/50, p<0.001). With logistic regression analysis, baseline hemoglobin (OR 0.96, p=0.015), multi-vessel disease (OR 3.2, p=0.006), visual % DS (OR 1.13, p<0.001), QCA MLD (OR 0.01, p<0.001), QCA %DS (OR 1.26, p<0.001), QCA length (OR 1.22, p<0.001), lesion length >20mm (OR 13.0, p<0.001), haziness (OR 7.9, p<0.001), irregularity (OR 7.9, p<0.001), and MII (OR 1.04, p=0.049) were univariate predictors of FFR≤0.80. In multivariate analysis, QCA %DS (OR 1.22, p<0.001), lesion length >20mm (OR 7.6, p=0.004), haziness (OR 16.6, p=0.005), and multi-vessel involvement (OR 7.8, p=0.019) remained independent predictors for FFR≤0.80.

Conclusions: Lesions with FFR≤0.80 are longer, tighter and were more likely to be irregular, hazy, and involve multi-vessels. These results indicate that there are several useful angiographic parameters that could improve functional significance prediction from the angiogram.