Functional Syntax score based on quantitative flow ratio vs. anatomical Syntax score

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Background/Introduction: Percutaneous Coronary Intervention With Taxus and Cardiac Surgery (SYNTAX) score takes into consideration only the anatomy of the coronary network, while the Functional Syntax Score based on Quantitative Flow Ratio (FSSQFR) combines all the information derived from both anatomy and physiology of coronary arteries.

Purpose: To investigate the level of agreement between anatomical SYNTAX Score I (SS) and FSSQFR and its possible impact on risk re-stratification of patients and on revascularization options.

Methods: We performed an offline QFR analysis in consecutive patients who underwent coronary angiography in a single Greek center. A total of 410 patients with accountable FSSQFR were included. The latter was counted by summing the individual points only of physiologically significant lesions (vessel QFR ≤0.8). Patients were divided into low-, intermediate- and high risk according to SS and FSS with the same cutoff. The primary endpoint was the estimation of the predictive value of FSSQFR for the composite outcome of cardiovascular death, myocardial infarction and ischemia-driven revascularization at follow-up.

Results: FSSQFR and SS were estimated for all patients. After calculating the FSSQFR, 12% (48/410) of study patients changed the risk group. Most of them moved from higher-risk group by SS to lower-risk group and only three of them presented the opposite movement. Moreover, 5.9% (24/410) of patients, for whom coronary artery bypass grafting would be recommended according to SS, converted to favor percutaneous coronary intervention after FSSQFR calculation. After a median 30.2 (25.7-33.7) months follow-up period, the cumulative incidence of a composite of cardiac death, myocardial infarction or ischemia-driven revascularization was 4.6%, 10.7%, and 24.1%, in the low, intermediate, and high FSSQFR group correspondingly (log-rank P<0.001) (Figure 1). After multivariate regression analysis, FSSQFR was an independent predictor of the primary endpoint after adjustment for age, gender, smoking, and hypertension (adjusted OR: 1.08 [95% CI, 1.05–1.12]; P<0.001). The area under the curve for FSSQFR to predict the 2-year composite endpoint was higher than that of the classic anatomic SYNTAX score (0.711 vs. 0.706; p<0.001) (Figure 2).

Conclusions: In our study, FSSQFR found to be an independent predictor of higher cardiovascular adverse events. Also, compared with SS, FSSQFR significantly improved risk classification of patients with coronary disease widening the possible therapeutic options.
Composite primary endpoint

Event-free survival

Follow-up period (months)

Low FSSQFR group
Intermediate FSSQFR group
High FSSQFR group

Log Rank $p<0.001$
Receiver-Operating Characteristic Curves of SS and FSSQFR for the primary composite endpoint at follow up.

AUC = area under the curve; ROC = Receiver-Operating Characteristic curves