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# FFRct analysis for screening of obstructive coronary artery disease: a propensity score adjusted study

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**Background:** Guidelines recommend functional assessment in stable coronary artery disease (CAD) to guide further treatment. Computed tomography fractional flow reserve (FFRCT) has been proposed for non-invasive assessment of stable CAD. A cutoff value of FFRCT $\geq$0.8 has been shown cost-effective, and allowing to avoid inappropriate invasive coronary angiography (ICA). However, no results from real-life hospital registries have been reported yet.

**Purpose:** We aimed to compare the impact of FFRCT with conventional coronary CT angiography (CTA) for detecting obstructive CAD in the daily practice of a tertiary referral hospital.

**Methods:** Patients referred to CTA for suspected CAD between 2013 and 2017 were included. FFRCT analysis was introduced in 2015 and performed at the discretion of the radiologist by Heartflow Inc. FFRCT was considered abnormal if FFR was $<$0.8 in at least one of 3 main vessels. Obstructive CAD was defined on both CTA and ICA by the presence of a stenosis $\geq$50% in at least one of 3 main vessels, or an invasive FFR$<$0.8. Propension to perform a FFRCT was modeled, based on gender, cardiovascular risk factors, completion of stress test and echocardiography and presence of a lesion of more than 50% stenosis on CTA. A logistic regression adjusted for the propensity score was then performed on the use of ICA, the presence of significant CAD on ICA and revascularization rate either by PCI or CABG.

**Results:** 2906 patients (50% of male, 56±12) were included in this registry. Diabetes, hypertension, dyslipidemia and smoking were present in respectively 12.3, 30.5, 27.5 and 9% of patients. A stress ECG and a transthoracic echo were obtained in respectively 37.1 and 49% of patients. FFRCT was performed in 757 (26%) and was abnormal in 323 (42.7%) of the patients. An ICA was performed in 622 (21.4%) patients and was abnormal in 292 (46.9%). After propensity score weighting, FFRCT was associated with an increase in ICA (OR=1.58, 95% CI: 1.23–2.02, p$<$0.01). There were no significant changes regarding ICA showing obstructive CAD with FFRCT (OR=1.13, 95% CI: 0.78–1.66, p=0.5) but a trend towards an increase of revascularization (OR=1.48, 95% CI: 0.98–2.24, p=0.06). In patient undergoing an ICA, a FFRCT $\geq$0.8 was decreasing the presence of significant CAD (OR=0.27, 95% CI: 0.16–0.48, p$<$0.001), whereas a FFRCT $<$0.8 increased the rate of revascularization (OR=24.7, 95% CI: 12.3–49.7, p$<$0.001).

**Conclusion:** These real life data showed that, adding FFRCT to conventional CTA, and interpreting only the numerical values of FFRCT, would increase the use of ICA in patients suspected of CAD. A trend towards an increase in revascularization was also observed. Therefore, another index than the minimal FFRCT should be used to improve discrimination regarding the presence of obstructive CAD. However, normal values of FFRCT were strong predictors of the absence of significant CAD, and abnormal values of FFRCT for the need of a revascularization.