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Optimizing diagnosis of obstructive coronary artery disease by CT angiography and ischemia test: a randomized clinical trial.

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Aim: In patients with suspected coronary artery disease (CAD), computed tomographic angiography (CTA) may improve patient selection for invasive coronary angiography (ICA) as alternative to functional testing. However, the role of CTA in symptomatic patients after abnormal functional test is incompletely defined.

Methods and results: This randomized clinical trial conducted in single academic tertiary center selected 218 symptomatic patients (pts) with mild to moderately abnormal functional test referred to invasive coronary to receive either the originally intended ICA (n = 103) or CTA (n = 115). CTA interpretation and subsequent care decisions were made by the clinical team. Patients with high risk features on functional tests, previous acute coronary syndrome, previously documented CAD, chronic kidney disease (GFR<60ml/min/1.73m2 ) or persistent atrial fibrillation were excluded. The primary endpoint was the percentage of ICA with no significant obstructive CAD (no stenosis =50%) in each group. Diagnostic and revascularization yields of ICA in either group were also assessed. Subjects averaged 68 ±9 years of age, 60% were male, 29% were diabetic. Nuclear perfusion stress test was used in 33.9% in CTA group and 31.1% in control group (p=0.655). Mean post (functional) test probability of obstructive CAD was 34%. Overall prevalence of obstructive CAD was 32.1%. In the CTA group, ICA angiography was cancelled by referring physicians in 83 of the pts (72.2%) after receiving CTA results. For those undergoing ICA, nonobstructive CAD was found in 5 pts (15.6%) in the CTA-guided arm and 60 (58.3%) in the usual care arm (P<0.001). Mean cumulative radiation exposure related to diagnostic work up was similar in both groups (6±14 vs 5±14mSv, P=0.152), but a greater cumulative contrast dose in the CTA-guided group (87.5±21 vs 77±40, p=0.026) was observed. Both diagnostic (84.4% vs 41.7, p<0.001) and revascularization (71.9% vs 38.8%, p=0.001) yields were significantly higher for CTA-guided ICA as compared to standard functional test-guided ICA.

Conclusions: In patients with suspected CAD and mild to moderately abnormal functional test, a diagnostic strategy including computed tomographic angiography as gatekeeper is effective and significantly improves diagnostic and revascularization yields of invasive coronary angiography.