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Coronary artery CT as the first imaging test for patients with suspected coronary artery disease and indications for invasive coronary angiography: primary outcomes of the CAT-CAD randomised trial

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THEME: Coronary Interventions
TOPIC(S): Stable CAD

AIMS

Efficacy and safety evaluation of coronary computed tomography angiography (CCTA) as the first choice anatomic test in stable patients with indications to invasive coronary angiography (ICA) due to suspected significant coronary artery disease (CAD).

METHODS AND RESULTS

This is a prospective, randomised, open-label, single centre trial. The study was supported by an Institute of Cardiology in Warsaw, Poland (grant 2.13/III/2015). Between April 23, 2015 and April 28, 2016 we enrolled 120 consecutive stable patients with suspected significant CAD (mean age of 60.6±7.9 years, 42 females). We randomised 60 patients to CCTA group and 60 patients to direct ICA group. Anatomical test results were used to determine the subsequent course of treatment for patients according to routine clinical practice. This included: conservative treatment, subsidiary functional tests, or interventional treatment (PCI/CABG). All patients were monitored for the occurrence of possible primary efficacy and safety outcomes during diagnostic and therapeutic cycle (up to 3 months, or until the last diagnostic/therapeutic procedure was complete). One third of participants 41(34.2%) either had known CAD previously diagnosed on angiography or had previously undergone coronary revascularisation. The patients did not differ significantly with regard to any baseline characteristics, angina symptoms, stress test results, presence and severity of CAD ($p<0.05$ for all characteristics).

The number of patients undergoing catheterisations in CCTA group was reduced by 64.4% as compared to direct ICA group (21 vs 59, respectively), with the median number of invasive procedures in CCTA group significantly lower than in direct ICA group (0[0-1] vs 1[1-2], $p<0.0001$).

The number of patients with non-actionable ICAs (i.e., not directly followed by interventional therapies) was reduced by 88.1% by the CCTA strategy (5 vs 42 respectively, $p<0.0001$).

The composite outcome of myocardial infarction, death, acute coronary syndrome, unplanned coronary revascularisations, cardiovascular related hospitalisation (composed solely of hospitalisations associated with invasive diagnostics or treatment) was reduced by 66.2% in CCTA group as compared to direct ICA group (25 vs 74, respectively, $p<0.0001$). The resulting median length of hospital stay to complete the diagnostic and therapeutic course was significantly lower in CCTA group than in direct ICA group (0[0-2] vs 2[2-5] days, respectively, $p<0.0001$).

Over the diagnostic and therapeutic course, there were no significant differences between both groups regarding the volumes of contrast material (80.3ml [70.0-115.0] vs 90.0ml [70.0-100.0], $p=0.0994$, respectively) while a non-significant trend towards higher radiation in CCTA group was observed (9.9mSv [7.0-22.1] vs 9.4mSv [5.2-14.0], $p=0.0567$, respectively).

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CONCLUSIONS

CCTA as the first anatomical diagnostic test in patients with suspected CAD and indications for ICA, may be an effective 'gatekeeper' to the cardiac catheterisation laboratory. It allows non-invasive, outpatient based, triage of two thirds of patients without significant or actionable CAD, obviating unnecessary invasive examinations, reducing the number of hospitalisations and its length. Our findings thus seem to bode well for the future role of CCTA, owing to the increasingly recognised relatively low prevalence of actionable, functionally significant CAD in patients with classic indications for ICA.

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