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Computed tomography angiography versus Agatston score for diagnosis of coronary artery disease in patients with stable chest pain: individual patient data meta-analysis of the international COME-CCT Consortium

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OBJECTIVES
There is conflicting evidence about the comparative diagnostic accuracy of the Agatston score versus computed tomography angiography (CTA) in patients with suspected obstructive coronary artery disease (CAD).

PURPOSE
To determine whether CTA is superior to the Agatston score in the diagnosis of CAD.

METHODS
In total 2452 patients with stable chest pain and a clinical indication for invasive coronary angiography (ICA) for suspected CAD were included by the Collaborative Meta-analysis of Cardiac CT (COME-CCT) Consortium. An Agatston score of > 400 was considered positive, and obstructive CAD defined as at least 50% coronary diameter stenosis on ICA was used as the reference standard.

RESULTS
Obstructive CAD was diagnosed in 44.9% of patients (1100/2452). The median Agatston score was 74. Diagnostic accuracy of CTA for the detection of obstructive CAD (81.1%, 95% confidence interval [CI]: 77.5 to 84.1%) was significantly higher than that of the Agatston score (68.8%, 95% CI: 64.2 to 73.1%, p < 0.001). Among patients with an Agatston score of zero, 17% (101/600) had obstructive CAD. Diagnostic accuracy of CTA was not significantly different in patients with low to intermediate (1 to < 100,

100-400) versus moderate to high Agatston scores (401-1000, > 1000).

CONCLUSIONS

Results in our international cohort show CTA to have significantly higher diagnostic accuracy than the Agatston score in patients with stable chest pain, suspected CAD, and a clinical indication for ICA. Diagnostic performance of CTA is not affected by a higher Agatston score while an Agatston score of zero does not reliably exclude obstructive CAD.

KEY POINTS

• CTA showed significantly higher diagnostic accuracy (81.1%, 95% confidence interval [CI]: 77.5 to 84.1%) for diagnosis of coronary artery disease when compared to the Agatston score (68.8%, 95% CI: 64.2 to 73.1%, $p < 0.001$).
• Diagnostic performance of CTA was not affected by increased amount of calcium and was not significantly different in patients with low to intermediate (1 to <100, 100-400) versus moderate to high Agatston scores (401-1000, > 1000). • Seventeen percent of patients with an Agatston score of zero showed obstructive coronary artery disease by invasive angiography showing absence of coronary artery calcium cannot reliably exclude coronary artery disease.