

## Diagnostic and prognostic value of coronary artery calcium score of zero: is it time for guidelines to change?

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**Funding Acknowledgement:** Type of funding source: None

**Introduction:** Cardiac computed tomography (CT) use has progressively increased as the preferred initial test to rule out coronary artery disease (CAD) when clinical likelihood is low. Coronary artery calcium (CAC) detected by CT is a well-established marker for cardiovascular risk. However, it is not recommended for diagnosis of obstructive CAD. Absence of CAC, defined as an Agatston score of zero, has been associated to good prognosis despite underestimation of non-calcified plaques.

**Purpose:** To evaluate whether zero CAC score could help ruling out obstructive CAD in a safely manner.

**Methods:** Observational study based on a prospective database of patients (pts) referred to cardiac CT between 2017 and 2019. Pts with an Agatston score of zero were selected.

**Results:** We included 176 pts with zero CAC score and non-invasive coronary angiography performed. The median duration of follow-up was 23.9 months. Baseline characteristics of the population are shown in Table 1. In 117 pts (66.5%), cardiac CT was indicated as part of their chest pain eval-

uation. Mean age was 57.2 years old, 68.2% were women and only 9.4% were active smokers. Normal coronary arteries were found in 173 pts (98.3%). Obstructive CAD, defined as  $\geq 50\%$  luminal diameter stenosis of a major vessel, was present in 1/176 (0.6%); while non-obstructive atherosclerotic plaques were found in 2 pts (1.1%). During follow-up, one patient died of out-of-hospital cardiac arrest. None either suffered from myocardial infarction or needed coronary revascularization.

**Conclusions:** In our cohort, a zero CAC score detected by cardiac CT rules out obstructive coronary artery disease in 98.3%, with only 1.7% of non-calcified atherosclerosis plaques and 0.6% of major adverse events. Although further research on this topic is needed, these results support the fact that non-invasive coronary angiography could be avoided in patients with low clinical likelihood of CAD and zero CAC score, facilitating the management of the increasing demand for coronary CT and reduction of radiation dose.

Table 1

Variable	Mean $\pm$ SD / n (%)
Age (years)	57.2 $\pm$ 13.3
Female	120 (68.2%)
Tobacco use	16 (9.4%)
Hypertension	64 (36.8%)
Diabetes mellitus	15 (8.6%)
Dyslipidaemia	58 (33.3%)
Cardiovascular death	1 (0.6%)

SD = standard deviation.