RULING OUT OF SIGNIFICANT CORONARY HEART DISEASE BY EXCLUSION OF CORONARY CALCIFICATIONS WITH CARDIAC MULTIDETECTOR ROW COMPUTED TOMOGRAPHY

ACC Poster Contributions
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Multidetector Row Computed Tomography (MDCT) is an established diagnostic modality for reliable non invasive detection of coronary calcifications as a marker of coronary atherosclerosis. Calcium Scoring (CS) has shown to be a reliable tool for risk stratification of asymptomatic patients. But it still remains unclear weather CS is a useful parameter for ruling out of significant coronary heart disease (CHD) in symptomatic patients where CHD is suspected. The purpose of this study was to prove diagnostic accuracy for ruling out CHD by exclusion of coronary calcium deposits.

An overall of 4096 symptomatic patients (2685 men, age of 58.2 ± 15 years) with suspected CHD and an indication for invasive coronary angiography (ICA) were included. All patients underwent ICA and quantitative coronary analysis (QCA) for stenosis graduation was performed. As significant CHD a luminal obstruction of ≥ 50% in at least one coronary vessel was defined. Within 3 days MDCT (Siemens Sensation 4, Siemens Volume Zoom 16, Siemens Medical Solutions, Siemens, Forcheim, Germany) coronary calcium screening was performed and calcium Volume Score (VS) was calculated. Evaluation was blinded to the results of ICA.

A significant CHD was found in 1576 men and 607 women showing a mean VS of 634 ± 499 which was significantly higher than mean VS of 187 ± 101 in 1109 men and 804 women without significant CHD p < 0.001. An overall of 578 patients had no evidence of coronary calcium. Within this group of patients a significant CHD was detected in 7 men and 5 women all being younger than 60 years. Using a VS threshold of 1 a negative predictive value (NPV) of 98% with a sensitivity of 99% could be calculated. Specificity was 30% and positive predictive value was found to be 62%. Increasing the VS threshold to 100 leaded to an increase of specificity (47%) and PPV (66%), but simultaneously decreased sensitivity (82%) and NPV (71%).

Ruling out of significant CHD in patients older than 60 years is possible by the exclusion of coronary calcifications with a high negative predictive value. In younger patients or with the use of higher score thresholds the use of CS for this purpose is not reliable and additional diagnostic modalities such as MDCT angiography are recommended.