

Change of stable angina work-up in a large cardio-thoracic center could lead to a faster, safer and cheaper diagnosis on presence of significant coronary artery disease.

Introduction

- Thoracic pain is a predominant reason for referral to the outpatient cardiology clinic.
- Significant coronary artery disease (CAD) as cause for these complaints is limited; <10%.
- Efficient diagnostic work-up with a limited number of tests with a high negative predictive value is beneficial.
- Coronary computed tomography angiography (CCTA) and single-photon emission computed tomography (SPECT) are recommended and the most used first line tests in this cardio-thoracic center to diagnose CAD
- CCTA is used in patients with a low to intermediate pre-test probability and SPECT in patients with an intermediate to high pre-test probability
- CCTA is a more patient friendly (given the shorter duration), safer (less radiation exposure) and cheaper method compared to SPECT

Hypothesis

CCTA has not been used to its maximum potential in patients with thoracic pain visiting the outpatient clinic and referral patterns should be shifted towards CCTA imaging

Method

Retrospective cohort study

Inclusion criteria

- >18 years old
- Thoracic pain
- Referred from the outpatient cardiology clinic

Exclusion criteria

- History of CAD
- Absence of or other complaints (e.g. arrhythmias)
- Referred from the emergency ward

CCTA and SPECT results were classified in:

	CCTA	SPECT
Normal	Calciumscore of 0 or a stenosis <50%	Summed Stress Score <3
Abnormal	Calciumscore >400 or a stenosis >50%	Summed Stress Score >3
Non-conclusive	No definite judgement due to e.g. artefacts	Ejection fraction <50% + Summed Stress Score <3 or no definite judgement

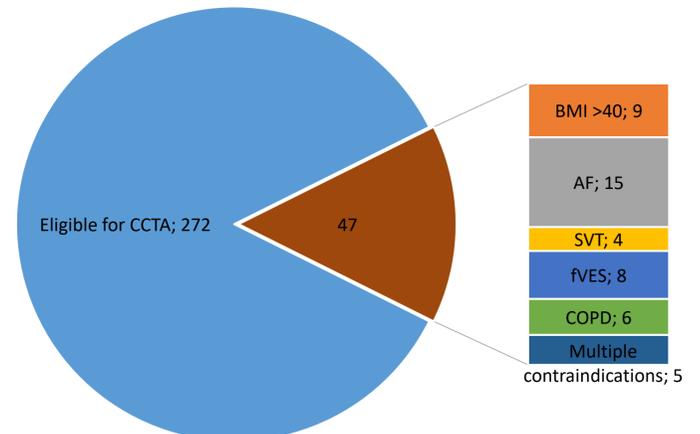
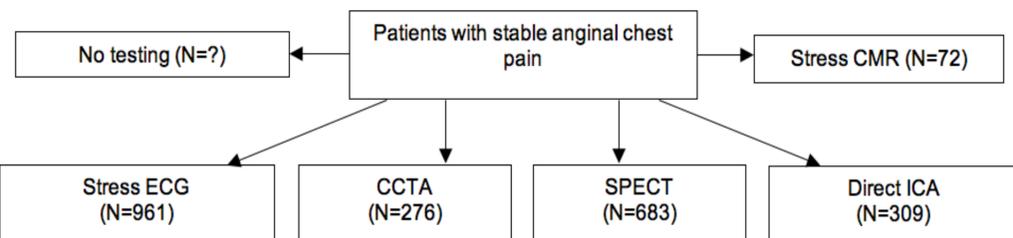
Baseline

Table 1: Baseline characteristics

	CCTA N=276	Missing	SPECT N=683	Missing
AGE	̄ 55.4		̄ 67.8	
SEX	87 Male (31.5%)		273 Male (40.0%)	
RISK FACTORS				
Hypertension	105 (38.0%)		364 (53.3%)	
Dyslipidemia	71 (25.7%)	104 (37.7%)	293 (42.9%)	216 (31.6%)
Family history	114 (41.3%)	35 (12.7%)	220 (32.2%)	224 (32.8%)
Smoker		12 (4.3%)		73 (10.7%)
current	47 (17.0%)		105 (15.4%)	
former	82 (29.7%)		216 (31.6%)	
Diabetic	16 (5.8%)		146 (21.4%)	
eGFR <60	6 (2.2%)	6 (2.2%)	124 (18.2%)	173 (25.3%)
BMI	̄ 28.1	170 (61.6%)	̄ 27.8	
PTP CAD				
<5% Low	55 (19.9%)		17 (2.5%)	
5-15% Intermediate	150 (54.3%)		302 (44.2%)	
>15% High	71 (25.7%)		364 (53.3%)	
EXERCISE STRESS ELECTROCARDIOGRAPHY				
Positive	25 (9.1%)		15 (2.2%)	
Non-conclusive	39 (14.1%)		105 (15.4%)	
ECHOCARDIOGRAPHY				
Lv-function <50%	0 (0.0%)		29 (4.2%)	
Severe valve dysfunction	2 (0.7%)		5 (0.7%)	

Abbreviations: CAD = coronary artery disease; CCTA = computed tomography coronary angiography; PTP = pre-test probability SPECT = single-photon emission computed tomography

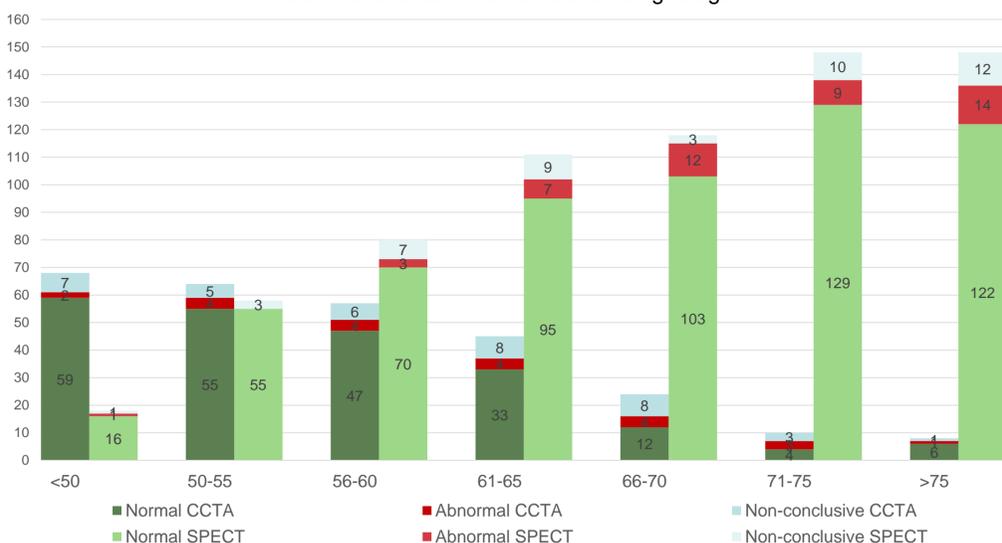
Results



Flowchart of all patients who met the inclusion criteria referred to the outpatient cardiology clinic with stable anginal chest pain in 2019.

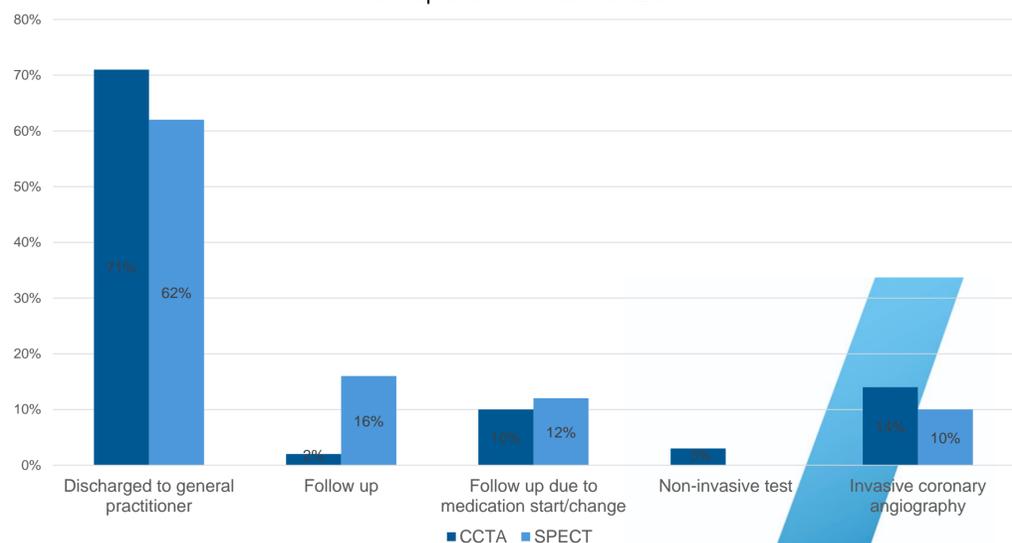
319 patients in the SPECT group had a low to intermediate pre-test probability. Of these, 47 had a contraindication for CCTA. This leads to 272 patients being eligible for CCTA.

CCTA and SPECT outcome according to age



CCTA showed a normal result in 79% and SPECT in 87% of all patients. Until the age of 65, CCTA and SPECT were equally able to exclude CAD. After the age of 65, CCTA often showed a non-conclusive result compared to SPECT. However, CCTA was able to exclude CAD in 65% of patients with a high pre-test probability.

Work-up after CCTA and SPECT



After CCTA more patients were discharged to their general practitioner and more ICA were performed. After SPECT, more patients had a follow up at the outpatient cardiology clinic.

Conclusion

In conclusion, despite CCTA and SPECT are mostly used according to the current ESC guidelines, in a substantial number of patients referred for additional testing for thoracic pain a safer (4 vs. ~9 mSv radiation exposure), faster (~30minutes vs. twice ~2hrs) and cheaper (€196,89 vs. €871,05, NZA) CCTA instead of SPECT, could have been indicated in the outpatient cardiology clinic of the Amphia Hospital.