

identify the relation of Cheyne Stoke respiration and left ventricular dysfunction.

METHODS In a cross sectional study involving 100 heart failure patients, we performed echocardiography and full night-attended polysomnography for all patients.

RESULTS 47.9% of patients with ischemic heart disease had obstructive sleep apnea (OSA) while 37.5% had central sleep apnea (CSA). OSA was highly prevalent in hypertensive heart disease (79.2%). On the other hand, patients with dilated cardiomyopathy had CSA presented in 50.0% vs. 39.3% had OSA. Patients with dilated cardiomyopathy had a significant increase in the central apnea index (11.05 ± 9.19 event/h) as well cycle length of Cheyne stoke respiration (68.14 ± 13.26 sec) as compared with other groups. There were inverse increase of cycle length with reduction in left ventricular ejection fraction (LVEF) (LVEF $\geq 50\%$ had cycle length of 41.55 ± 10.84 s. while those with LVEF $\leq 30\%$ had a longer mean cycle length 69.23 ± 18.09 s.

CONCLUSION Sleep-disordered breathing (SDB) is a common disorder in different groups of heart failure. OSA was prevalent in ischemic and hypertensive heart disease, while CSA was prevalent in dilated cardiomyopathy.

CRT-400.08

The Relationship Between Carotid Artery Intimal-medial Thickness And Left Ventricular Function Assessed By Speckle Tracking Echocardiography In Patients Of Coronary Artery Disease



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BACKGROUND Carotid intima-media thickness (CIMT) is a non-invasive, inexpensive, reliable marker of coronary artery disease (CAD). LV global longitudinal strain function (LV GLS) can be accurately assessed by 2D speckle-tracking strain echocardiography (2D-STE).

OBJECTIVE To assess the relationship between carotid IMT and left ventricular global longitudinal strain (LV GLS) assessed by 2D speckle-tracking strain echocardiography (2D-STE) in patients with CAD. It also aimed to assess the ability of both LV global longitudinal strain (LV GLS) and carotid IMT to predict CAD severity.

METHODS It included 156 patients with suspected CAD by history of angina admitted electively for coronary angiography (CA). We excluded patients with acute coronary syndrome and concomitant disease or drug therapy which affect cardiac function. Patients underwent transthoracic echocardiography (TTE), (2D-STE), B-mode ultrasound of the carotid arteries and coronary angiography. The patients were divided into two groups: group 1 (106 patients) with significant ($>70\%$) CAD, and group 2 (50 patients) ($<70\%$). Examinations included measurements of cardiac dimensions and LV ejection fraction. Images were obtained for the global peak systolic longitudinal strain (PSLS). Measurement of CIMT was performed at the far wall of the common carotid artery (CCA) 1cm proximal to the bifurcation.

RESULTS There were significant increase in the mean CIMT and significant decrease in GLS in group 1 compared to group 2 (1.43 ± 0.41 vs 0.72 ± 0.4 , $p < 0.001$), and (-12.2 ± 2.93 vs -16.65 ± 3.5 , $p < 0.001$) respectively. The cut-off value for LVGLS less than -15.8% using ROC curve was a predictor of significant CAD with AUC 0.82, 95%CI 0.71 - 0.94, $p < 0.001$. The sensitivity, specificity and accuracy of GLS for detecting significant CAD were 96.2%, 68.0%, and 87.2% respectively. The cut-off value of the CIMT > 1.1 mm using ROC curve was a predictor of significant CAD with AUC 0.89, 95% CI 0.81-0.96, $p < 0.001$. The sensitivity, specificity and accuracy of mean CIMT was 92.5%, 84.0% and 89.7%. There was significant negative correlation between global LVGLS and mean carotid IMT ($r = -0.88$, $p < 0.0001$ and positive correlation with EF ($r = 0.37$, $p = 0.001$).

CONCLUSION Increased CIMT was associated with decreased LV function assessed by 2D strain echocardiography. Decreased GLS and increased CIMT were associated with significant CAD; So these findings support the use of CIMT measurements to predict subclinical LV dysfunction and the risk of CAD.

CRT-400.10

Diagnostic Accuracy of FFR-CT: Implications for Clinical Decision Making



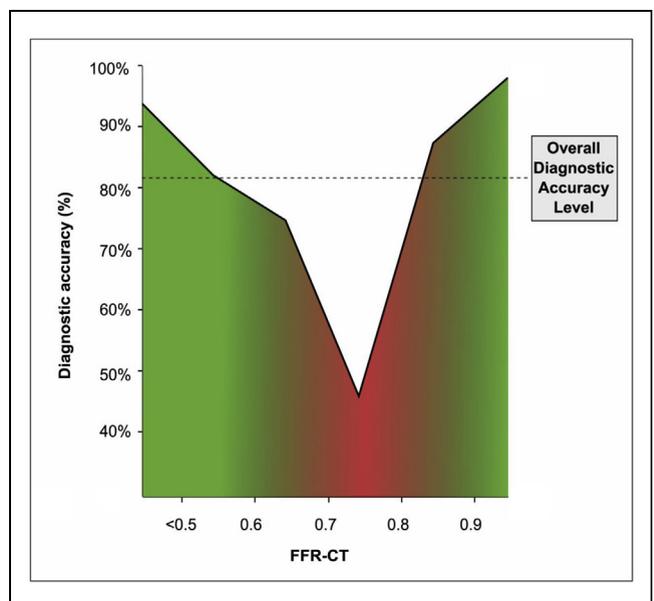
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BACKGROUND FFR-CT is a novel non-invasive test for myocardial ischemia. Clinicians using FFR-CT must be able to interpret FFR-CT results in order to determine subsequent patient care.

METHODS A systematic review was performed of studies comparing FFR-CT diagnostic performance to invasive FFR. Data were digitized and an analysis was performed comparing FFR-CT to invasive FFR across each 0.10-U FFR-CT value range. FFR-CT ≤ 0.80 and FFR ≤ 0.80 was used as the diagnostic cutpoint, with FFR as the reference standard.

RESULTS There were a total of 908 vessels from 536 patients in 5 studies. The mean age was 63.2 years, 71% were male, 67% had hypertension and 26% had diabetes. Mean, median and inter quartile range (IQR) of FFR-CT and FFR were $0.82 (\pm 0.13)$, 0.86, 0.15 and $0.85 (\pm 0.13)$, 0.88 and 1.73 respectively. The overall per-vessel diagnostic accuracy of FFR-CT was 81.9% [95% CI 79.4-84.4]. For vessels with FFR-CT values below 0.60, 0.60 to 0.70, 0.70 to 0.80, 0.80 to 0.90 and above 0.90, diagnostic accuracy of FFR-CT was 86% [78.0 to 94.0], 75% [71.9-77.5], 46% [42.9-49.3], 87% [85.1-89.5] and 98% [97.9-98.8], respectively.

CONCLUSION The clinician can be very confident that a lesion with an FFR-CT value <0.6 or >0.9 will have an invasive FFR of ≤ 0.80 and >0.80 , respectively. In between there is more uncertainty from the FFR-CT measurement. A clinician, faced with a new patient and deciding whether FFR-CT is likely to be useful should try to judge whether all FFR-CT values are likely to be ≥ 0.90 , as this might lead to prevention of the cost and risk of an angiogram.



CRT-400.11

Optimal Assessment Of Lesion Severity In The Left Anterior Descending Artery By Quantitative Flow Ratio. The Wire-free Invasive Functional Imaging WIFI LAD Study



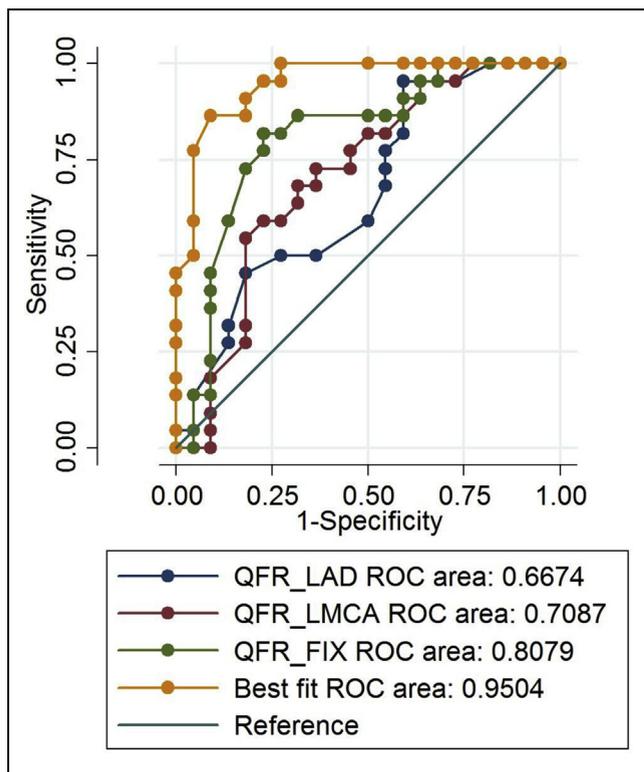
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BACKGROUND Quantitative flow ratio (QFR) is a novel diagnostic modality enabling functional coronary lesion assessment by computation of invasive coronary angiography. QFR analysis in the prognostic proximal left anterior descending artery (LAD) is highly sensitive to observer decisions and optimal analysis is unknown.

METHODS The study was a pooled analysis of the WIFI-I (NCT02795585) and WIFI-II (NCT02264717) QFR studies. Cases with diffuse disease and lesions involving the proximal LAD were analyzed by three different analysis approaches for QFR and results were compared to fractional flow reserve (FFR). Methods were based on automatic reference function fitted to 1) the LAD, 2) the LMCA, or 3) a gender specific fixed reference size.

RESULTS A total of 215 LAD lesions were analyzed in the two studies and 62 had diffuse disease involving the proximal LAD. After exclusion of cases with short non-visible left main coronary arteries, severe overlap, no nitro administration, 44 cases entered analysis. The differences between QFR and FFR were, 1) for QFR_LAD -0.03 (SD 0.10), for 2) QFR_LMCA 0.05(SD 0.11) and for 3) QFR_FIX 0.02 (SD 0.09). Diagnostic accuracy was determined by the receiver operator characteristics (ROC) curves (figure) and best fit was shown for QFR_FIX. Best combined fit achieved an AUC of 0.95 as the theoretic maximum. A modified algorithm for QFR analysis of proximal LAD based on gender specific fixed reference size is proposed and evaluated against the three evaluated methods and the best combined fit. The optimal QFR analysis algorithm and dual observer results are presented at CRT.

CONCLUSION QFR is a very promising tool for wire-free in-procedure physiological lesion assessment but evaluation of proximal LAD lesions is strongly influenced by the analysis approach. An optimized, evidence based analysis algorithm is presented.



CRT-400.12
Feasibility and Diagnostic Precision of In-procedure Computed Fractional Flow Reserve: The Wire-free Invasive Functional Imaging (WIFI) Study



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BACKGROUND Quantitative flow ratio (QFR) is a novel diagnostic modality enabling functional coronary lesion assessment based on reconstructed CAG images without the need for pressure wires and medically induced hyperemia. The aim of WIFI was to evaluate the feasibility and diagnostic performance of in-procedure QFR during coronary angiography (CAG).

METHODS The study was a prospective, clinical, feasibility study including unselected, consecutive patients with indication for fractional flow reserve (FFR). QFR and 3D QCA was calculated in-procedure using Medis Suite (Medis medical imaging BV, The Netherlands). The application required essential modifications during the study and blinded in-center core laboratory (QFR and 3D QCA) reanalysis was performed with the final version of QFR. NCT02795585.

RESULTS A total of 100 patients had attempted FFR, 6 had missing or insufficient FFR data and one had an aorto-ostial stenosis, resulting in 93 patients in analysis. Mean diameter stenosis was 47%, SD 9%. Mean FFR was 0.81, SD 0.09 and 28% had FFR values in range 0.77-0.83. Mean total time to QFR was 10 min, SD 3 min. Mean difference between FFR and in-procedure QFR was -0.02, SD 0.12. Specificity=0.80 [0.66; 0.89], sensitivity=0.64 [0.48; 0.77], PPV=0.74 [0.57; 0.87], NPV=0.71 [0.57; 0.82]. Area under the receiver-operating characteristic curve (AUC) was 0.77 [0.67; 0.87]. Reanalysis with the final QFR application improved agreement with FFR, with a mean difference of 0.00, SD 0.07. Specificity=0.86 [0.73; 0.93], sensitivity=0.66 [0.51; 0.79], PPV=0.81 [0.64; 0.92], NPV=0.74 [0.60; 0.84]. AUC was 0.87 [0.79; 0.94] for QFR, compared to 0.75 [0.65; 0.85] for diameter stenosis (%) assessed by 3D QCA (p=0.01).

CONCLUSION Coronary lesion evaluation by in-procedure QFR was feasible. Analysis time and in-procedure QFR results were affected negatively by learning curve and early application issues. Core laboratory reanalysis resulted in good diagnostic accuracy compared to FFR, and QFR provided significantly improved diagnostic performance compared to evaluation by QCA.

SCIENCE

CRT-600.01
Down-regulation of Small Ubiquitin Modifier 1 Gene Expression Correlates With Higher Lipid Arc in Stable Angina Patients With Atherosclerosis



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