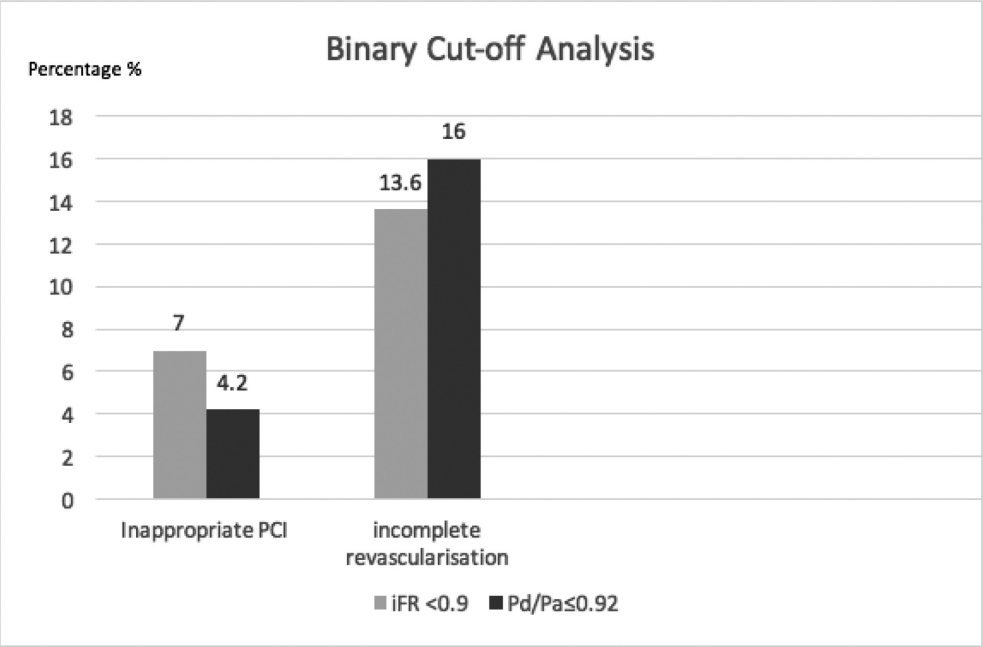


Abstract 29 Figure 2 Total number of inappropriate PCI's and incomplete revascularisations when binary cut-offs are utilised for Pd/Pa and iFR. Numbers shown are % of total, n = **257**

were 9.4% vs 11.9%, p = 0.55. Sensitivity analyses showed no impact of a variety of angiographic measures of stenosis severity or myocardial area at risk. Comparing proximal stenoses (Syntax segments 1, 11, 5 and 6) to all other lesions and using the RESOLVE cutoff of ≤0.90 for iFR the level of misclassification was 27.7% vs 15.2%, p = 0.014 (Table 1). Using the iFR cutoff of <0.90 the level of misclassification was 26.3% vs 16.2%, p = 0.05.

Conclusion When compared to FFR, binary cut-offs for iFR and Pd/Pa results in misclassification of 1 in 5 lesions. Using a hybrid strategy approximately half of the patient do not receive adenosine but 1 in 10 lesions is still misclassified. Neither resting index or strategy can be recommended for decision making in the cath lab. Operators wishing to use resting indices of stenosis severity should be particularly cautious when interpreting data from proximal stenoses in prognostically important vessels.

30 HEAD-TO-HEAD COMPARISON OF TWO NOVEL INDICES OF MICROCIRCULATORY RESISTANCE AT PREDICTING MICROVASCULAR DYSFUNCTION. USE OF THE BEST INDEX TO EXPLORE THE EFFECT OF COLD AIR INHALATION DURING EXERCISE IN CORONARY ARTERY DISEASE PATIENTS

[1]Rupert Williams*, [1]Kaleab Asrress, [1]Matthew Lumley, [2]Guus de Waard, [1]Kalpa De Silva, [1]Satpal Arri, [1]Howard Ellis, [1]Tiffany Patterson, [1]Vasiliki Manou-Stathopoulou, [1]Zeeshan Khawaja, [1]Natalia Briceno, [1]Brian Clapp, [2]Sven Plein, [3]Niels van Royen, [1]Divaka Perera, [1]Mike Marber, [1]Simon Redwood. *[1]St Thomas' Hospital; [3]VU University Medical Center; [2]Leeds University; *Presenting Author*

10.1136/heartjnl-2016-309890.30

Introduction Highest rates of exertion related cardiac death occur during cold air inhalation (CAI): e.g. shovelling snow, but the pathophysiology is unclear. Novel intracoronary wires that simultaneously measure arterial pressure (P_d) and blood flow (CBF) allow quantification of coronary micro-vascular resistance (MVR).

A. We compared the accuracy of Doppler-derived hyperemic micro-vascular resistance (hMR) and thermodilution-derived index of microcirculatory resistance (IMR) at predicting micro-vascular dysfunction, as there is no current invasive gold-standard measurement of MVR.

B. In coronary artery disease (CAD) patients we explored the effects of exercise with and without CAI on MVR (using the most accurate measure from **A.**) and CBF.

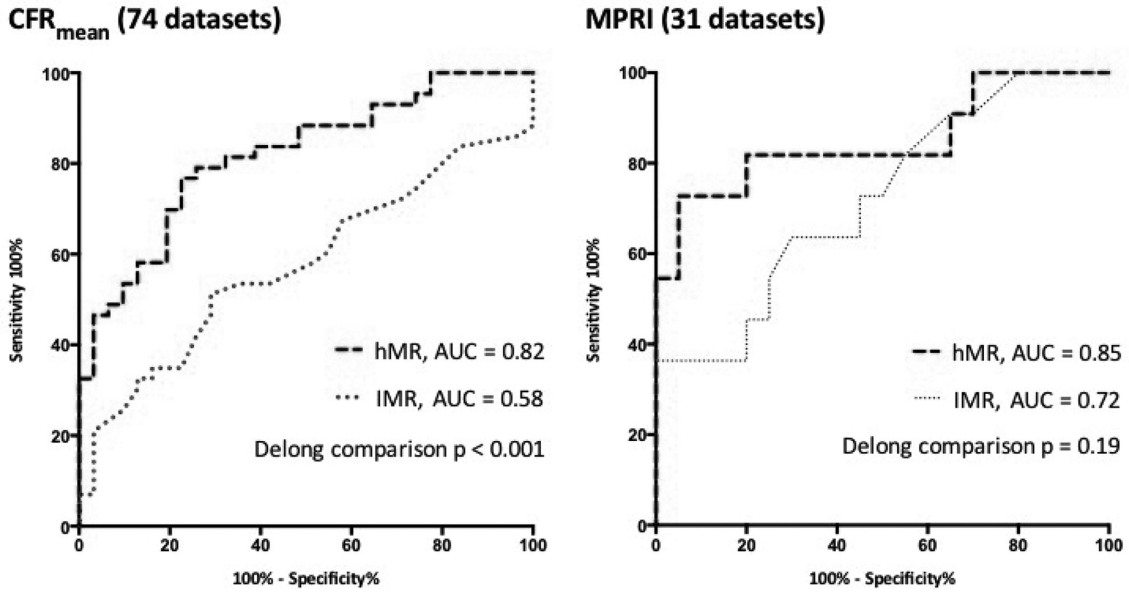
Methods A. 56 patients (61+/-10 years) undergoing cardiac catheterization for stable CAD or acute myocardial infarction (AMI) were recruited. Simultaneous intracoronary pressure, Doppler flow velocity and thermodilution were carried out in 74 unobstructed vessels, at rest and during hyperemia. Three independent measures of micro-vascular function were assessed, using predefined dichotomous thresholds: 1) CFR_{mean}, the average value of Doppler- and thermodilution-derived coronary flow reserve (CFR), and cardiovascular magnetic resonance derived 2) Myocardial Perfusion Reserve Index (MPRI) and 3) Micro-vascular Obstruction (MVO).

B. 35 CAD patients (61+/-9 years) undertook 5 min of either:

1. CAI (-15°C)
2. Exercise (Incremental supine ergometry)
3. Exercise with CAI.

We measured baseline and peak MVR (P_d/CBF) and CBF, and calculated the proportional contribution of waves that accelerate versus decelerate CBF as a coronary perfusion efficiency index.

Results A. hMR had better diagnostic accuracy than IMR to predict CFR_{mean} (area under curve, (AUC) 0.82 vs. 0.58, p < 0.001, sensitivity/specificity 77/77% vs. 51/71%) and MPRI (AUC 0.85 vs. 0.72, p = 0.19, sensitivity/specificity 82/80% vs. 64/75%). In AMI patients, the AUCs of hMR and IMR at predicting MVO were 0.83 and 0.72 respectively (p = 0.22, sensitivity/specificity 78/74% vs. 44/91%).



Abstract 30 Figure 1 Defining best measure of microvascular resistance

B. 47 datasets were obtained:

1. n = 10
2. n = 24
3. n = 13. (12 patients did both conditions 2 and 3, in randomized order).

MVR increased during CAI alone ($p = 0.04$), and decreased during exercise ($p < 0.0001$). Exercise with CAI was associated with less decrease in MVR (NS). The increase in CBF was similarly 34% less during exercise with CAI ($p = 0.04$) versus without ($p < 0.0001$). Coronary perfusion efficiency increased during exercise ($p < 0.05$), but CAI during exercise abolished this.

Conclusions A. Doppler-derived hMR may have superior diagnostic accuracy than IMR at predicting invasive and non-invasive measures of micro-vascular function.

B. CAI attenuates the reduction in MVR and the increases in CBF and coronary perfusion efficiency that normally occur during exercise. These suggest impedance of coronary vasodilatation and ventricular relaxation, rendering the heart more susceptible to ischaemia.

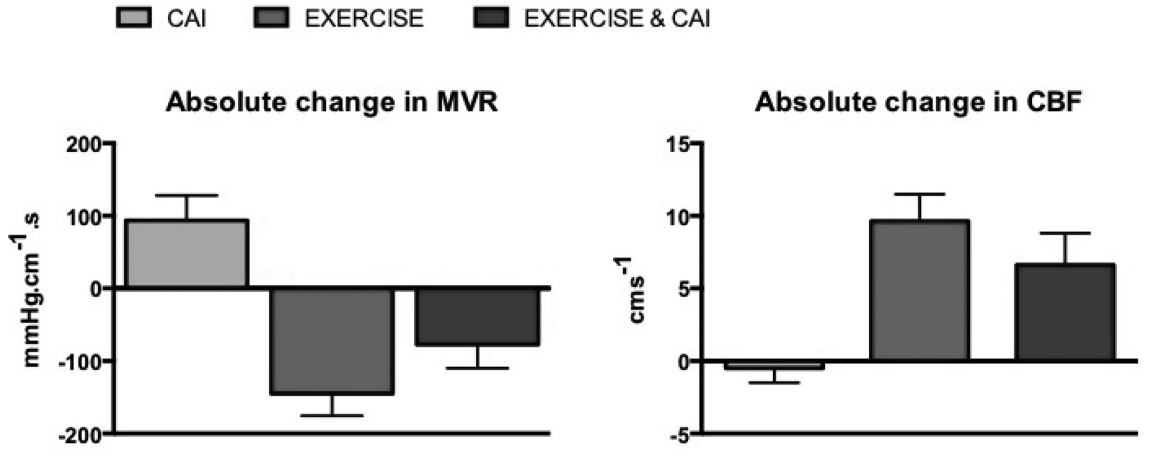
Acute Coronary Syndromes

31 UNRAVELLING THE MECHANISMS OF MENTAL STRESS INDUCED MYOCARDIAL ISCHAEMIA

[1]Satpal Arri*, [2]Rupert Williams, [2]Mathew Lumley, [2]Howard Ellis, [2]Kaleab Asrress, [2]Tiffany Patterson, [2]Richard Cooke, [2]Divaka Perera, [2]James Coutts, [2]Brian Clapp, [2]Michael Marber, [2]Simon Redwood. [1]*St Thomas' Hospital*; [2]*St Thomas' NHS Trust*; **Presenting Author*

10.1136/heartjnl-2016-309890.31

Background Mental stress triggers myocardial ischaemia at cardiac workloads that are lower than those that cause exercise-induced ischaemia in the same patient. Clinical relevance is highlighted by observational studies demonstrating marked



Abstract 30 Figure 2 Simultaneous measurement of microvascular resistance during cold air inhalation and exercise