= 4412) and validation (n = 4350) prognostic models based on clinical data available at first presentation showed good performance with close agreement and the final model utilised all 8762 patients to maximize power.

Results The prognostic model showed strong associations with coronary mortality forage, sex, typicality of chest pain, smoking status, diabetes, pulse rate and ECG findings. Model discrimination was good (C statistic 0.83), patients in the highest risk quarter accounting for 173 coronary deaths during follow-up (10 year risk of death: 8.7%) compared with a total of 60 deaths in the three lower risk quarters. Observed 10-year coronary mortality increased with increasing estimates of disease probability, ranging from 0.2% to 25.4% with CAD probability of <10% and >90%, respectively. However, when our prognostic model was simplified to incorporate only those factors used by the updated Diamond-Forrester (age, sex and character of symptoms) it under-estimated coronary mortality risk, particularly in patients with risk factors.

Conclusion For the first time in patients with suspected angina, a prognostic model is presented based on simple clinical factors available at the initial cardiological assessment. The model discriminated powerfully between patients at high risk and at lower risk of coronary death during the 10-year follow-up period. Its potential clinical utility was reflected in the prognostic value it added to the updated Diamond-Forrester diagnostic model of disease probability.

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91 THE EFFECTIVENESS AND COST-EFFECTIVENESS OF SPINAL CORD STIMULATION FOR REFRACTORY ANGINA (RASCAL STUDY): A PILOT RANDOMIZED CONTROLLED TRIAL

[1]Edward Davies*, [2]Sam Eldabe, [3]Simon Thomson, [4]Rui Duarte, [2]Moran Brookes, [2]Mark deBelder, [5]Jon Raphael, [6]Rod Taylor. *[1]South West Cardiothoracic Centre; [2]The James Cook University Hospital; [3]Basildon and Thurrock University Hospitals; [4]University of Birmingham; [5]Dudley Group of Hospitals NHS Foundation Trust; [6]University of Exeter Medical School; *Presenting Author*

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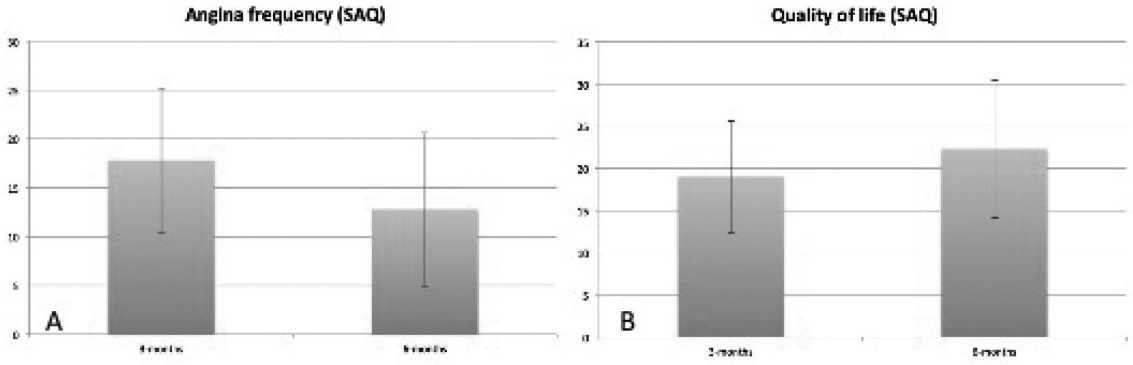
Introduction Patients with refractory angina (RA) unsuitable for coronary revascularization experience high levels of hospitalization and poor health-related quality of life. Randomized trials have shown spinal cord stimulation (SCS) to be a promising treatment for chronic stable angina and RA; however, none has compared SCS with usual care (UC). The aim of this pilot study was to address the key uncertainties of conducting a definitive multicenter trial to assess the clinical and cost-effectiveness of SCS in RA patients, i.e., recruitment and retention of patients, burden of outcome measures and our ability to standardize UC in a UK NHS setting.

Methods Patients were recruited from 4 UK sites between January 2011 and June 2014. RA was defined as Class III or IV angina despite optimal anti-angina therapy with angiographically documented coronary artery disease deemed unsuitable for revascularization by the referring cardiologist or cardiothoracic surgeon. All patients had demonstrable ischemia on functional testing and satisfied multidisciplinary assessment for SCS suitability. RA patients deemed suitable were randomized in a 1:1 ratio to SCS plus UC (SCS group) or UC alone (UC group). We sought to assess: recruitment, uptake, and retention of patients; feasibility and acceptability of SCS treatment; the feasibility and acceptability of standardizing UC; and the feasibility and acceptability of the proposed trial outcome measures. Patient outcomes were assessed at baseline (prerandomization) and three and six months postrandomization.

Results We failed to meet our planned recruitment target (45 patients) and randomized 29 patients (15 SCS group, 14 UC group) over a 42-month period across our sites. None of the study participants chose to withdraw following consent and randomization. With exception of two deaths, all completed evaluation at baseline and follow-up. Although not formally powered to compare outcomes either within or between groups, we did see evidence of an improvement in health related quality of life demonstrated by the disease-specific Seattle Angina Questionnaire (SAQ) as well as generic quality of life questionnaires, exercise capacity, and reduction in angina frequency at follow-up in both groups, with a trend towards larger improvements in the SCS group (Figure 1).

Conclusions While patient recruitment was found to be challenging, levels of participant retention, outcome completion, and acceptability of SCS therapy were high. Lessons learnt from this pilot study will help develop an appropriately



Abstract 91 Figure 1 (A) Between group mean difference at three and six months for angina frequency (SAQ) adjusted for baseline score and stratification variables (i.e. centre, CCS class, age < 65 vs. ≥65 years). Positive between-group difference in SAQ indicates superior scores for SCS group compared with UC group. (B) Between-group mean difference at three and six months for SAQ angina quality of life score adjusted for baseline score and stratification variables (i.e. centre, CCS class, age <65 vs. ≥65 years). Error bars represent standard error of difference. Positive between-group difference in SAQ indicates superior scores for SAC group compared with UC group

powered trial to detect any meaningful superiority of spinal cord stimulation for RA patients.

92 THE ASSOCIATION OF NIGHT-TIME SYSTOLIC BLOOD PRESSURE WITH ULTRASOUND MARKERS OF SUBCLINICAL CARDIAC AND VASCULAR DAMAGE

[1]Anne Marie O'Flynn*, [2]Ronan Curtin, [1]Patricia Kearney. [1]*University College Cork*; [2]*Cork University Hospital*; **Presenting Author*

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Background Ambulatory blood pressure monitoring (ABPM) measures blood pressure (BP) over a prolonged period and has been shown to be superior to office BP for the prediction of clinical events. In particular, night-time systolic BP is a stronger predictor than systolic daytime BP. It is not yet clear if night-time BP should be a specific therapeutic target although some studies have demonstrated promising results. Subclinical cardiovascular disease is a prognostic marker for future cardiovascular events. Our aim is to examine the association of night-time systolic BP with subclinical cardiac dysfunction measured by global longitudinal strain (GLS) and subclinical vascular damage measured by carotid intima media thickness (CIMT) and carotid plaques.

Methods In 2014 a random sample of 80 individuals, stratified by BP status at baseline recruitment to the Mitchelstown Cohort Study, were invited to undergo repeat ABPM, echocardiogram and carotid ultrasound. ABPM was performed using the Spacelabs 90217 monitor. GLS was measured by speckle-tracking analysis of echocardiogram images carried out on a Philips iE33 ultrasound machine. Mean CIMT was measured at the distal 1 cm of the common carotid artery. Still images were taken from 3 angles on both sides of the neck using a Philips Cx50 ultrasound machine. The presence of carotid plaques was recorded. Philips QLAB cardiac and vascular ultrasound quantification software was used for analysis. The association of night-time systolic BP with GLS, CIMT and carotid plaques was assessed using linear and logistic regression.

Results Fifty (response rate 63%) individuals took part in this study. In univariable models night-time systolic BP was significantly associated with GLS (Beta coefficient 0.85 for every 10 mmHg rise, 95% CI 0.3–1.4) and carotid plaques (OR 1.9 for every 10 mmHg rise, 95% CI 1.1–3.2). Univariable analysis of daytime systolic BP did not demonstrate any statistically significant associations. In age and sex adjusted models, the association for night-time systolic BP and GLS remained significant (Beta coefficient 0.7 for every 10 mmHg rise, 95% CI 0.1–1.3). The association for carotid plaques was no longer statistically significant. In multivariable models findings were diminished.

Discussion Our results support an association between night-time systolic BP and subclinical cardiac and vascular disease. However this is a small study which limits generalisability and the sample size may have provided insufficient power to detect true associations between night-time systolic BP and target organ damage in multivariable models and CIMT in particular. The use of ABPM and ultrasound technology may help guide therapeutic decisions in those with hypertension. When assessing ABPM results the absolute night-time BP seems to be the most important parameter but ultimately a large randomised controlled trial involving chronotherapy is necessary to fully address this.

93 A DOUBLE-BLIND PLACEBO-CONTROLLED RANDOMISED STUDY OF THE EFFECTS OF CANDESARTAN VERSUS AMLODIPINE ON CAPILLARY RAREFACTION IN ESSENTIAL HYPERTENSION

[1]Rajendra Raghuraman, [2]Christine Carney, [2]Oluwabusola Ogunseitan, [2]Helen Mullahy, [3]Duolao Wang, [4]Tarek Antonios*. [1]*St. George's, University of London*; [2]*St. George's University Hospitals NHS Foundation Trust*; [3]*Liverpool School of Tropical Medicine*; [4]*SGUL*; **Presenting Author*

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Background A reduction in the density of capillaries (rarefaction) is known to occur in many tissues in patients with essential hypertension (HTN) and plays a crucial role in increasing peripheral resistance and blood pressure (BP). The aim of this clinical trial was to assess in a controlled, double blind, placebo-controlled design the effects of treatment of HTN with candesartan or amlodipine on microvascular rarefaction and other indices of vascular function in individuals with mild-to-moderate essential HTN.

Methods The capillary microcirculation was studied using the well-validated intravascular microscopy technique. After a 2-week single-blind placebo run-in period, patients who remained hypertensive (systolic BP 140–180 mmHg and/or diastolic BP 90 –110 mmHg) were randomised to 8-weeks treatment with either candesartan 8 mg daily (with forced titration to 16mg after 2 weeks) or amlodipine 5 mg orally daily (with forced titration to 10 mg after 2 weeks). Other vascular measurements included pulse wave velocity with Complior machine, central BP and Aortic Augmentation Index measurements with Omron HEM-9000AI machine.

Results Treatment with candesartan and amlodipine significantly reduced both brachial and central BP at 4 and 8 weeks (mean change -19.0 mmHg; 95% CI -−11.1 to -−26.9, $p < 0.0001$), and to 8 weeks active treatment (mean change -26.3 mmHg; 95% CI −17.5 to −35.0, $p < 0.0001$) but had no significant effect on basal (functional) or maximal (structural) capillary densities. Both drugs also reduced central BP and Aortic augmentation index significantly after 4 and 8 weeks but there was no significant changes in PWV.

Conclusions The study confirms that 8 weeks treatment with either candesartan or amlodipine significantly reduces radial and central BP in essential HTN but may not be a sufficient circumstance for inducing a regression in microvascular abnormalities.

94 FLOW-CONTRACTION MATCHING IN THE HUMAN HEART: A NOVEL INVASIVE STUDY OF THE COMPLEX CARDIAC-CORONARY INTERACTION IN ISCHAEMIC HEART DISEASE

[1]Tiffany Patterson*, [2]Simone Rivolo, [2]Satpal Arri, [3]Brian Clapp, [1]Divaka Perera, [2]Michael Marber, [2]Jack Lee, [3]Simon Redwood. [1]*KCL/St Thomas' Hospital*; [2]*King's College London*; [3]*St Thomas' Hospital*; **Presenting Author*

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Background A first-in-human study of simultaneous invasive real-time left ventricular (LV) and coronary haemodynamics in the cardiac catheter lab enabling accurate delineation of the complex cardiac-coronary interaction and influence of antianginal therapy in coronary artery disease (CAD).

Method 15 patients completed the protocol (Figure;A&B). Coronary measurements (baseline and 1 mg isosorbide