genes (MYL3, TPM1, ACTC1), in addition to the desmosomal genes DSG2, DSC2 and JUP.

Conclusion Predictive testing has potentially allowed up to 789 genotype-negative individuals (and their offspring) to be reassured and discharged from long term cardiac follow-up. Our data suggests adult females are more forthcoming for predictive testing than their male counterparts. The absence of testing for several cardiomyopathy genes suggests low frequency or low penetrance of these variants in the Irish population. The large size of families in our cohort represents an opportunity to develop gene penetrance and genotype-phenotype correlation data to assist in clinical management of genotype-positive individuals.

Oral abstracts

5 COMPARISON OF NEXT GENERATION P2Y12 INHIBITORS TO CLOPIDOGREL IN PATIENTS WITH ACUTE CORONARY SYNDROME: AN ANALYSIS FROM THE BRITISH CARDIOVASCULAR INTERVENTION SOCIETY DATABASE OF 382,361 'REAL-WORLD' PATIENTS

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Objective and Background Dual antiplatelet therapy is standard of care in patients with acute coronary syndrome (ACS) treated with percutaneous coronary intervention (PCI), however debate remains regarding the optimal P2Y12 receptor antagonist to combine with aspirin.

Methods We performed a retrospective analysis of all PCI procedures for ACS recorded in the British Cardiovascular Intervention Society database between 2007 and 2014 treated with aspirin and either clopidogrel, prasugrel or ticagrelor. The primary outcome measure was 30-day all-cause mortality, with secondary outcomes of mortality at 1 and 5 years. Odds ratios (OR) for mortality were determined from multivariable logistic regression. We used multiple imputations to address missing values and reduce inherent bias from complete case-only analysis. Difference in outcome amongst patients receiving different P2Y12 inhibitors was evaluated by Kaplan-Meier survival curves and log-rank testing. All statistical analysis, including calculation of marginal effects, was performed using SPSS version 21 and R software version 2.13.1.

Results Among 382,361 eligible patients with 2 million person-years of observation, 6.8% (n=26,000) of patients had ticagrelor, 8.0% (n=30,590) had prasugrel and 85.2% (n=325,771) were treated with clopidogrel for ACS. Mean age of participants was 62.8±4.3 years; 77.1% of patients were males and 31.6% had diabetes. The proportion of people undergoing intervention for stable angina was largest and comprised of 164,797 participants, followed by NSTEMI [157,532 participants] with only a small proportion of patients undergoing intervention for a STEMI [60,032 participants]. ACS patients treated with clopidogrel were slightly older and had a higher percentage of people who had renal failure, but a lower proportion in this group were treated for a STEMI. This reflects on the increasing provision for PCI for STEMI during years when prasugrel and ticagrelor were introduced as options. Crude mortality rates for ACS

Abstract 5 Figure 1 Cumulative incidence of all-cause mortality over 1 year showing (A) adjusted rates in all ACS patients treated with either clopidogrel, ticagrelor or prasugrel (B) adjusted rates in all NSTEMI patients treated with either clopidogrel, prasugrel or ticagrelor (adjusted rates in STEMI patients treated with clopidogrel, prasugrel, or ticagrelor. HR: hazard ratio; CI: confidence intervals

were 34.7, 31.6 and 30.9 deaths per 1000-person-years for patients receiving clopidogrel, prasugrel, and ticagrelor, respectively. In age-sex unadjusted multinomial logistic regression analysis, use of ticagrelor or prasugrel rather than clopidogrel led to respective reductions in 1-year mortality of 64% [OR 0.34, 95% CI (0.32–0.36)], and 27% (OR 0.73 (0.69–0.77), $p < 0.0001$). Using clopidogrel as the reference, the age-sex adjusted 1-year mortality rate was 63% [(OR 0.37 (0.34–0.40)] and 57% [(OR 0.43 (0.40–0.45), $p < 0.0001$)] lower with ticagrelor and prasugrel, respectively in ST-elevation myocardial infarction (STEMI) patients and 80% [(OR 0.20 (0.18–0.23), $p < 0.0001$)] and 36% [(OR 0.43 (0.40–0.45), $p < 0.0001$)] lower in non-STEMI patients. Furthermore, using marginal effects, we demonstrate that while the probability of mortality increases with increasing age and BMI, it is lower across all ages and BMIs for patients on ticagrelor compared to patients on prasugrel. Figure 1 demonstrates the cumulative incidence for all-cause mortality stratified by antiplatelets.

Conclusions This very large, real-world dataset of patients presenting with ACS demonstrates a significant net clinical benefit favouring the use of ticagrelor and prasugrel over clopidogrel in ACS patients for DAPT. This analysis concurs with the data from the landmark TRITON and PLATO RCTs, suggesting these agents should be considered as the standard of care in the management of ACS.

6 DEMOGRAPHIC, CLINICAL AND ANGIOGRAPHIC PROFILE OF YOUNG ADULTS (≤45 YEARS) UNDERGOING PERCUTANEOUS CORONARY INTERVENTION FOR ST ELEVATION MYOCARDIAL INFARCTION

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Introduction Premature (defined as ≤45 years old at presentation) ST Elevation Myocardial Infarction (STEMI) remains a significant population health issue despite overall reductions in

age adjusted incidence of acute myocardial infarction (AMI). Premature STEMI may be associated with a different risk profile to AMI presenting at a later age, and/or a different pattern of clinical presentation; and consequently may benefit from an age tailored secondary preventative strategy.

Methods Retrospective chart review of all patients who underwent angiography in a single primary percutaneous coronary intervention (PCI) centre over a 68 month period for suspected STEMI. Patients were stratified as young (≤ 45 years) or older (>45 years). Documented risk factors, procedural metrics and clinical outcomes were recorded and compared between the two groups [table 1].

Results Of the 2045 consecutive patients presenting with STEMI, 193 (9.44%) were young. While 1601 (78%) of all presentations were male, a significantly greater proportion of younger patients were male (165/193; 85%; $p<0.005$). Younger patients had significantly fewer diagnosed comorbidities such as angina (4.2% vs 13.9%; $p<0.005$), prior PCI (5.4% vs 10.2%; $p=0.006$), dyslipidaemia (35.6% vs 53.8%;

$p<0.005$) or hypertension (47.6 vs 26.5%; $p<0.005$), however were more likely to be current smokers (68.9% vs 45.1%; $p<0.005$). Younger patients were more likely to present in stable condition (90.8% vs 86%; $p=0.048$), and less likely to be in cardiogenic shock (1.1% vs 3.2%; $p<0.005$). Radial access was more common in younger patients (95.3% vs 90.3%; $p=0.022$). Following initial angiography, a significantly greater proportion of younger patients did not require PCI (24.5% vs 10.9%; $p<0.005$), with a higher proportion of subsequent 'non-cardiac chest pain' diagnoses being made in the younger group (3.8% vs 1.9%; $p=0.022$). However there was no significant difference in combined rates of (peri-)myocarditis or Takotsubo cardiomyopathy (4.1% vs 3.8%; $p=0.72$). Length of stay was not significantly different between the groups (4.36 vs 4.27 mean days; $p=0.863$). Younger patients had a lower 30-day mortality rate (2.7% vs 5%; $p=0.049$). Of the 148 patients ≤ 45 years who had obstructive coronaries at angiography, 14 (9%) had abnormal HbA1c results without a diagnosis of

Abstract 6 Table 1 Baseline characteristics, risks factors and haemodynamic stability of those presenting with ST Elevation Myocardial infarction, stratified by age less than or greater than 45 years

Age (years)	≤ 45 (N=193)	>45 (N=1852)	Total	p-value
Sex				
Male	166 (86)	1435 (76)	1601 (78)	<0.005
Female	27 (14)	447 (24)	474 (22)	
Age (years) ^(a)	41 (38-44)	63 (56-72)	60 (51-70)	$<0.005^*$
LOS (days) ^(b)	4.36 (12.43)	4.27 (8.94)	4.29 (9.61)	0.863*
Risk Factors				
Previous MI	21 (6)	146 (10)	167 (9)	0.069
Prior PCI	18 (5)	165 (10)	183 (9)	0.006
Prior CABG	7 (2)	55 (3)	62 (3)	0.210
Angina	14 (4)	218 (14)	232 (12)	<0.005
Dyslipidaemia	103 (36)	683 (54)	786 (50)	<0.005
HTN	83 (27)	644 (48)	727 (44)	<0.005
Peripheral Vascular Disease	8 (2)	37 (2)	45 (2)	0.942
Stroke/TIA	8 (3)	64 (4)	72 (4)	0.167
CKD	5 (2)	50 (3)	55 (3)	0.106
Lung Disease	25 (8)	140 (9)	165 (9)	0.465
Smoking Status				
Current	197 (69)	593 (45)	790 (49)	<0.005
Former	20 (7)	357 (27)	377 (24)	
Never	69 (24)	365 (28)	434 (27)	
Diabetes				
Diet Controlled	11 (3)	88 (6)	99 (5)	0.698
OHGA	21 (6)	146 (9)	167 (9)	
Insulin	17 (5)	45 (3)	62 (3)	
Not Diabetic	292 (86)	1317 (83)	1609 (83)	
Admission Status				
Stable	334 (91)	1566 (86)	1900 (87)	0.02
Cardiogenic Shock	4 (1)	59 (3)	63 (3)	
Resuscitated Arrest	28 (8)	162 (9)	190 (9)	
RIP	0 (0)	1 (0)	1 (0)	
Other	2 (1)	33 (2)	35 (2)	

diabetes mellitus (DM), 5 of which were diagnostic at presentation. 67 (45%) had undiagnosed dyslipidaemia. Of the 63 younger patients who had echocardiograms prior to discharge, 37 (48%) had evidence of left ventricular dysfunction.

Conclusion The gender imbalance observed in STEMI presentations was exaggerated in younger patients. Our study correlates with previous literature suggesting that smoking carries a greater attributable risk for AMI in patients ≤ 45 years and reinforces the importance of smoking cessation in young males. These patients have high rates of undiagnosed DM and dyslipidaemia. The high rate of LVD is likely to have a significant impact on health outcomes in this young population.

7 MANAGEMENT OF AORTIC ROOT ANEURYSMS; A SINGLE SURGEON EXPERIENCE OVER TWENTY YEARS

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Introduction The aortic root is a complex anatomical structure. For many years, the Bentall operation was considered the gold standard approach to aortic root aneurysms regardless of the presence of absence of intrinsic lesions of the aortic valve. More recently valve sparing root replacement (VSRR) has been developed to avoid the requirement for anticoagulation particularly in younger patient cohorts with structurally normal valves and functional regurgitation. The purpose of this study is to review a single surgeon experience of managing aortic root aneurysms over twenty years. This includes the introduction of valve sparing root replacement and the associated learning curve.

Methods A retrospective institutional review of all patients undergoing aortic root surgery between 2003-2020 was undertaken. Data was retrieved from an institutional database search and patient follow-up attained from up to date regional electronic care records. Graphpad prism was used to carry out Kaplan Meier survival analysis comparing groups. A p value < 0.05 was considered statistically significant [table 1].

Results A total of 62 aortic root procedures were undertaken, 42 (69%) Bentall and 20 (31%) VSRR. VSRR was commenced in 2007 and the frequency increased over time. Of 23 VSRR undertaken, 20 were successful. Three of these

were for acute dissection. Mean follow up for Bentall patients was 98 months, for VSRR 62 months. Complications of Bentall included prosthetic valve endocarditis n=3 (7%), graft infection n=2 (5%), late cerebrovascular events n=3 (7%). There was no significant difference in survival between groups.

Conclusion While Bentall remains the gold standard therapy for aortic root aneurysms in many cases, valve sparing root replacement is an excellent option for well selected patients and our series demonstrated a lower incidence of serious endocarditis and graft infections. Furthermore, it carries the added advantage of not requiring anticoagulation in younger patients.

8 STENT OPTIMIZATION USING OPTICAL COHERENCE TOMOGRAPHY AND ITS PROGNOSTIC IMPLICATIONS AFTER PERCUTANEOUS CORONARY INTERVENTION

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Introduction Stent under-expansion has been known to be associated with worse outcomes. We sought to define optical coherence tomography (OCT) assessed optimal stent expansion index (SEI) which associates with lower incidence of major adverse cardiac events (MACE) during follow-up.

Methods We included 370 lesions who underwent PCI during 2012-2018 at five high volume European centers, with their final procedural results imaged using OCT. Stent expansion index (SEI) was calculated separately for both stent halves by dividing minimum stent area by the mean reference lumen area [(proximal reference area + distal reference area)/2]. (Figure 1, Panel A) Follow-up MACE was defined as a composite of all-cause death, myocardial infarction, stent thrombosis and target lesion revascularization.

Results A total of 316 cases (370 lesions) were analysed. Minimal stent area (MSA) of the whole cohort was 6.02 (4.65, 7.93) mm², while SEI was 0.79 (0.71, 0.86). During a median follow-up duration of 557 (326, 1,096) days, we recorded 47 (12.7%) incidences of MACE. Receiver operating characteristic (ROC) curve analysis identified 0.85 as SEI cut-off powered to predict MACE during follow-up (AUC= 0.60, sensitivity= 0.85, specificity= 0.34). (Figure 1, Panel B) MACE was observed in 38/249 (15.3%) of lesions with SEI <0.85 and in 9/121 (7.4%) of lesions with SEI ≥ 0.85 (p=0.03). Adaptive Lasso regression identified SEI <0.85 (OR=4.76, 95% CI=1.70-13.30, p=0.0029) and coronary calcification at baseline (OR=2.70, 95% CI=1.11-6.58, p=0.0292) as

Abstract 7 Table 1 Patient characteristics

	TRR n= 42	VSRR n= 20	Total n= 62
Reoperation for Bleeding	6 (14%)	3 (15%)	9 (14.5%)
Other Reoperation – Early	3 (7%)	0 (0%)	3 (5%)
Other Reoperation – Late	1 (2%)	1 (5%)	2 (3%)
Permanent CVA	4 (9%)	0 (0%)	4 (6%)
PPM	1 (2%)	1 (5%)	2 (3%)
Surgical infection – Early and late	5 (12%)	0 (0%)	5 (8%)
Prolonged ICU (in elective cases)	3 (7%)	0 (0%)	3 (5%)
Prosthetic valve endocarditis	3 (7%)	0 (0%)	3 (5%)
Aortic graft infection	2 (5%)	0 (0%)	2 (3%)
Lower respiratory tract infection	0 (0%)	1 (5%)	1 (2%)