patients to be either Duke criteria negative, or Duke possible and not treated for IE. PWID referred to the IE team who were either Duke definite or Duke possible and treated for IE acted as a comparison group. Patient demographics, microbiology, final diagnoses, survival and causes of death were recorded.

Results There were 112 episodes of other infections in 107 PWID during the study period. 69 (65%) patients were male, and the mean age was 36 ± 8.4 years. During the same period, we assessed and treated 105 episodes of confirmed IE in 92 PWID. There were positive blood cultures in 71 episodes, most commonly *Staphylococcus aureus* (39), coagulase negative *Staphylococcus* (3), beta-haemolytic *Streptococcus* (16), oral *Streptococcus* (7), *Streptococcus anginosus* (4), *Enterococcus* spp. (2), *Pseudomonas* (1) and other (7). In 10 episodes there was combined infection with two or more microorganisms, and in 41 episodes blood cultures were negative. Where IE was excluded, the final diagnosis was usually an infected deep vein thrombosis (DVT) (41) or skin and soft tissue infection (26). Other infections included osteomyelitis (9), septic arthritis (6), septic pulmonary emboli/lung abscess (5), central line infection (4), pneumonia (4), urinary tract infection (2), pericarditis (2) and in one episode there was a cerebral abscess. Survival following hospitalisation with an episode of infection was 91%, 86.4%, 83.5% and 70% at 1, 3, 5 and 10 years respectively. In univariate analysis, survival was significantly higher in PWID with other infections compared to those treated for IE during the same period ($p=0.0002$) (figure 1). During a median follow-up of 4.8 years there were a total of 26 deaths, with suicide or drug overdose being the cause of death in 9 cases.

Conclusion In approximately half of PWID referred to the IE team the final diagnosis was non-cardiac infection. In those with other infections the alternative diagnosis was usually an infected DVT or skin/soft tissue infection. Survival was favourable in those with other infections compared to those treated for IE. The implication of this finding is that cardiac infection

has a negative impact on survival in PWID beyond infection elsewhere. It seems likely that damaged native heart valves, or indwelling prosthetic material poses additional risk of re-infection in the context of ongoing drug use. The continuing high mortality rate in both groups suggests that improving the support offered to PWID might affect outcomes in the longer term.

Conflict of Interest None

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DIAGNOSIS OF ARRHYTHMOGENIC CARDIOMYOPATHY AND OVERLAP WITH CARDIAC ADAPTATION TO EXERCISE: INSIGHTS FROM A CARDIAC MAGNETIC RESONANCE STUDY

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Background The diagnosis of arrhythmogenic right ventricular cardiomyopathy (ARVC) is often challenging and structural abnormalities typical of the disease may overlap with changes reflective of cardiac adaptation to exercise. The aim of the study was to assess the performance of the cardiac magnetic resonance (CMR) 2010 Task Force Criteria (TFC) in a cohort of patients with definite diagnosis of ARVC and define the overlap with a cohort of highly trained athletes of similar age and sex.

Methods We compared the CMR features of 43 patients (mean age 49 ± 17 years, 49% males, 32 (74%) genotyped) with a definite diagnosis of ARVC according to the revised TFC to 97 (mean age 45 ± 16 years, 61% males) highly-trained athletes of similar age and sex, where cardiac disease was excluded after comprehensive work-up.

Results The CMR was abnormal in 37 (86%) patients. The RV was affected in isolation in 17 (39%) patients, with 18

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(42%) patients exhibiting biventricular involvement and 2 (5%) patients showing isolated left ventricular involvement. The most common RV abnormalities were regional wall motion abnormalities (RWMA) (n=34; 79%), RV dilatation fulfilling a major or minor volume TFC (n=18; 42%), impaired systolic function (RVEF $\leq$ 45%: n=17; 40%) and myocardial fibrosis (n=13; 30%). The predominant LV abnormality was myocardial fibrosis (n=20; 47%), with a small proportion of patients exhibiting RWMA (n=6; 14%) and impaired systolic function (LVEF $<$ 50%: n=6; 14%).

Twenty-three (53%) patients fulfilled a major (n=14; 32%) or a minor (n=9; 21%) CMR TFC. Sixteen (16%) athletes exceeded the cut-off values for RV volumes used as a major (n=10; 10%) or a minor (n=6; 6%) TFC with an inverse relationship between age and RV volumes ($r=-0.41$, $p=0.001$). None of the athletes fulfilled the TFC for RV ejection fraction. Applying the CMR TFC to the ARVC patient population, showed a sensitivity of 33% for the major and 28% for the minor criteria. Applying the RV volume and systolic function TFC values in the entire study population, showed a sensitivity of 53%, a specificity between 83% and an accuracy of 0.68. Please see (Figure 1).

Conclusion The great majority (86%) of patients with ARVC demonstrate structural abnormalities suggestive of cardiomyopathy on CMR but only 53% fulfil any of the CMR TFC. A small proportion (16%) of older athletes demonstrate significant RV dilatation that overlaps with the volume criteria for ARVC. The emergence of ARVC as a biventricular disease provides an opportunity to re-evaluate the diagnostic criteria and include LV involvement in conjunction with RV involvement to improve diagnostic accuracy.

Conflict of Interest no

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THE ADDITIONAL VALUE OF CARDIOPULMONARY EXERCISE TESTING OVER CONVENTIONAL TREADMILL TESTING IN PATIENTS WITH MODERATE TO SEVERE AORTIC STENOSIS

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Introduction Current guidelines recommend aortic valve replacement in patients with apparently asymptomatic severe aortic stenosis, who exhibit symptoms or a decrease in blood pressure on exercise testing. However, the additional information provided by cardiopulmonary exercise testing (CPET) is limited. This study sought to establish the additional information provided by CPET in this context.

Methods An analysis of patients with aortic stenosis undergoing CPET in an enhanced valve surveillance clinic was performed. Symptom limited cardiopulmonary exercise testing with respiratory gas exchange analysis was used, and the patients were encouraged to exercise until exhaustion.

Results 71 patients with moderate to severe aortic stenosis and good left ventricular function (AVVmax 4 0.5m/s MG 38 11mmHg, AVA 0.9 0.2cm², LVEF 60 8%) were included in the analysis. The mean age was 74.2 12.1 years and 51 patients (70.4%) were male. 33 (46.5%) patients had a background of hypertension, 12 (16.9%) had diabetes mellitus and 8 (11.3%) had coronary artery disease.

All patients denied cardiovascular symptoms at baseline. A total of 119 CPETs were performed. All patients exercised to respiratory exchange ratio (RER) $>$ 1.1 indicating good effort.

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Baseline demographics	
Age (years)	74.2 $\pm$ 12.1
Gender (male)	51 (70.4%)
Hypertension	33 (45.8%)
Diabetes mellitus	12 (16.9%)
Coronary artery disease	8 (11.3%)
Height (cm)	169 $\pm$ 9
Weight (kg)	77 $\pm$ 14
Echocardiographic data	
Peak aortic velocity (m/s)	4 $\pm$ 0.5
Mean gradient (mmHg)	38 $\pm$ 11
Aortic valve area (cm ²)	0.9 $\pm$ 0.2
Left ventricular ejection fraction (%)	60 $\pm$ 8
Cardiopulmonary exercise testing data	
Power (watts)	91 $\pm$ 49
Resting heart rate (bpm)	73 $\pm$ 12
Peak heart rate (bpm)	123 $\pm$ 18
Resting systolic blood pressure (mmHg)	149 $\pm$ 22
Peak systolic blood pressure (mmHg)	176 $\pm$ 25
Peak VO ₂ (ml/min/kg)	18 $\pm$ 5.2 (88 $\pm$ 16% predicted)
VE/CO ₂ slope	30.9 $\pm$ 6.5
Oxygen uptake efficiency slope	1787 $\pm$ 599 (97 $\pm$ 26% predicted)
Oxygen pulse	11 $\pm$ 3.1 (103 $\pm$ 26% predicted)