

### 3 SAFETY AND OUTCOMES OF A HIGH INTENSITY EXERCISE PROGRAMME IN YOUNG PATIENTS WITH HYPERTROPHIC CARDIOMYOPATHY: THE SAFE-HCM STUDY

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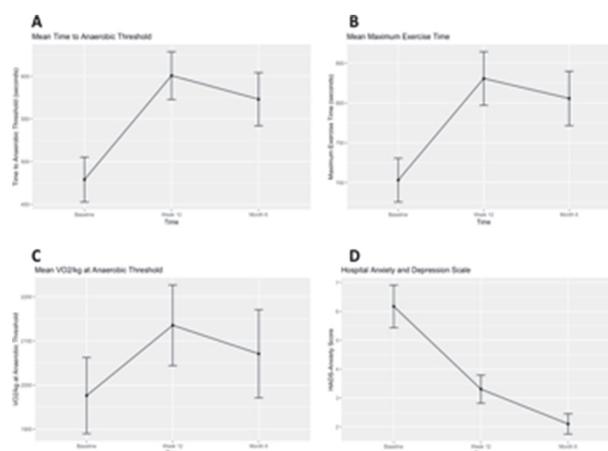
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**Background** Moderate intensity exercise training in older patients with hypertrophic cardiomyopathy (HCM) can improve functional capacity, without significant harm. However, younger patients are attracted to high intensity training (HIT) regimes. Purpose To assess the feasibility, safety and outcomes of an individually tailored, HIT programme in young patients with HCM and to assess whether observed benefits are sustained at 6 months.

**Methods** Eighty patients with HCM ( $45.7y \pm 8.6$ ) underwent baseline clinical and psychological assessment. Individuals were randomised to a 12-week HIT programme ( $n=40$ ) or usual care ( $n=40$ ). Baseline evaluation was repeated at 12 weeks (T12). Feasibility, safety, health and psychological benefits were assessed. At 12-weeks individuals were encouraged to continue with the frequency and intensity of physical activity (PA) achieved at the end of the cardiac rehabilitation programme. Participants in the exercise arm were invited to follow-up at 6 months (T6m).

**Results** The majority (83%) of participants completed the 12-week study. Reasons for refusal included travel, work and family commitments. Resource requirements were similar to other programmes. All individuals felt supported, more confident to exercise, and found educational materials clear and informative. At T12 there was no significant difference between groups in the composite arrhythmia safety outcome ( $p=0.99$ ). There was no significant difference between groups in episodes of non-sustained ventricular tachycardia (NSVT) ( $p=0.573$ ) or ectopic burden ( $p=0.729$ ). The indices of exercise capacity were significantly improved in the exercise compared to the control group; peak  $VO_2$  ( $+3.7\text{ml/kg/min}$  [CI 1.1,6.3],  $p=0.006$ ),  $VO_2/\text{kg}$  at anaerobic threshold ( $VO_2/\text{kgAT}$ ) ( $+2.44\text{ml/kg/min}$  [CI 0.6,4.2],  $p=0.009$ ), time to AT ( $+115\text{s}$  [CI 54.3,175.9],  $p<0.001$ ) and exercise time (max ET) ( $+108\text{s}$  [CI 33.7,182.2],  $p=0.005$ ). The exercise group also demonstrated greater reduction in systolic BP ( $-7.3\text{mmHg}$  [CI -11.7,-2.8],  $p=0.002$ ), BMI ( $-0.8\text{kg/m}^2$  [CI-1.1,-0.4],  $p<0.001$ ), anxiety ( $-2.6$  [CI-3.6,-1.6],  $p\leq 0.001$ ) and depression ( $-1.1$  [CI -2.0,-0.2],  $p=0.015$ ) scores. At T6m patient reported exercise adherence was comparable to baseline PA, in 33 of 34 of the exercise group attending for follow up. Most exercise gains dissipated with the exception of time to AT ( $p=0.002$ ), max ET ( $p=0.003$ ),  $VO_2/\text{kgAT}$  ( $p=0.04$ ) and anxiety score ( $p<0.001$ ) (figure 1). There were no sustained episodes of atrial or ventricular arrhythmias. The incidence of NSVT did not differ between time points ( $p=0.09$ ).

**Conclusion** A 12-week HIT programme in young patients with HCM offers considerable gains in fitness and psychological outcomes, with no increase in arrhythmic burden. Further research is still required to assess the long-term safety of high intensity exercise in the HCM population. At T6m exercise levels as well as most physiological adaptations and health benefits returned to baseline, as seen in other studies when



Abstract 3 Figure 1

formal participation in an exercise programme comes to an end. This highlights the importance of the implementation of strategies to encourage ongoing engagement in PA. Potential solutions include identification of barriers to exercise, as well as adoption of novel tele-rehabilitation approaches.

**Conflict of Interest** None

### 4 IMPACT OF LEFT VENTRICULAR ASSIST DEVICE THERAPY ON SEVERE SECONDARY MITRAL REGURGITATION

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**Background** Severe secondary mitral regurgitation (MR) worsens prognosis in patients with medically managed heart failure (HF). In patients treated by left ventricular assist device (LVAD), it is unclear whether severe MR should be corrected at time of LVAD implantation.

**Purpose** To evaluate impact of LVAD therapy on severe MR and non-severe MR over 1 year.

**Methods** Retrospective single centre study of consecutive patients who underwent Heartmate (HM) 2 or HM3 LVAD implantation between January 2011 and March 2020.

**Results** Of 155 patients, 20 were excluded due to LVAD exchange ( $n=10$ ), mitral valve repair ( $n=1$ ), or inaccessible pre-LVAD echocardiography ( $n=9$ ). Based on multiparametric grading, 29 patients had severe secondary MR and 106 non-severe secondary MR (including none). Severe MR patients were more often female (10/29 (34%) vs 11/106 (10%);  $p=0.002$ ) but were of similar age ( $54 \pm 12$  vs  $55 \pm 9$  years;  $p=0.624$ ), size ( $27 \pm 5$  vs  $27 \pm 4$   $\text{kg/m}^2$ ;  $p=1.0$ ), with equivalent renal function ( $53 \pm 22$  vs  $55 \pm 20$   $\text{ml/min/1.73m}^2$ ;  $p=0.641$ ) and median pre-operative NT-proBNP [4076 (IQR 206-5438) vs 4914 (IQR 2706-7518)  $\text{pg/L}$ ;  $p=0.488$ ]. There were similar proportions of patients with ischaemic aetiology [16/29 (55%) vs 66/106 (62%);  $p=0.488$ ] and those receiving HM2 [11/29 (38%) vs 32/106 (30%)] and HM3 [18/29 (62%) vs 74/106 (70%);  $p=0.575$ ] LVAD. Echocardiography before LVAD implantation demonstrated similar LV size (LV end-diastolic volume:  $133 \pm 44$  vs  $118 \pm 50\text{ml/m}^2$ ;  $p=0.145$ , LV