EFFECTS OF HOME BASED EXERCISE TRAINING IN EISENMENGER’S SYNDROME: SECONDARY ANALYSIS FROM A RANDOMIZED CONTROLLED TRIAL

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INTRODUCTION

Eisenmenger’s syndrome is a complication of various congenital heart disease. Development of pulmonary hypertension (PH) is a common sequela in congenital heart disease especially when they are not diagnosed or treated early – both a common problem in developing countries.1 The role of exercise training in PH has been gaining importance over the last decade.2 Recent systematic reviews and meta-analyses have shown benefits with exercise training on various functional outcomes across various etiologies of PH.3 However data on the role of exercise training in individuals with Eisenmenger’s syndrome is limited. Thus, the need for this secondary analysis of data.

OBJECTIVE

To analyze the data from a recently completed randomized controlled trial with a focus on participants with a diagnosis of Eisenmenger’s syndrome and determine the effects of a home-based exercise training program on functional outcomes and quality of life.

METHODOLOGY

Study design: Secondary analysis of a prospective randomized controlled trial
Study setting: Cardiac Rehabilitation Clinic, Kasturba Hospital & Department of Cardiology, Kasturba Hospital
Study duration: April 2012 – February 2016
Blinding: None
Allocation: Random

INCLUSION CRITERIA
• Diagnosis of PH
• Stable on medical therapy
• WHO functional class II-IV
• Age 18-70 years
• Either gender
• Tricuspid regurgitant velocity > 3.4 m/s ± RV dysfunction

EXCLUSION CRITERIA
• Acute myocardial infarction
• Acute pulmonary embolism
• Unstable arrhythmia
• Unstable PH
• Acute renal failure
• Severe neurological or orthopaedic problems limiting exercise training
• Patients on long term oxygen therapy and those receiving continuous positive airway pressure

Week	Exercise prescription
1-2	Active exercise to upper limb (2 sets of 5 reps) and lower limb (3 sets of 5 reps), Walking 10-20 min
2-4	Active exercise to upper limb (1-4 sets of 5 reps) and lower limb (4-5 sets of 5 reps), Walking 25-35 min
4-6	Active exercise to upper limb (1-4 sets of 10 reps) and lower limb (4-5 sets of 10 reps), Walking 25-30 min
6-8	Active exercise to upper limb (4-5 sets of 10 reps) and lower limb (6-7 sets of 10 reps), Walking 30-35 min
8-10	Active exercise to upper limb (5-6 sets of 15 reps) and lower limb (6-7 sets of 15 reps), Walking 35-40 min
10-12	Active exercise to upper limb (6-7 sets of 15 reps) and lower limb (7-8 sets of 15 reps), Walking 40-45 min

RESULTS

Baseline Variables

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<tr>
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<th>Control (n=5)</th>
<th>Baseline</th>
<th>Experimental (n=6)</th>
<th>Baseline</th>
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<tbody>
<tr>
<td>Age in years, mean ± SD</td>
<td>42 ± 7.12</td>
<td>37 ± 5.4</td>
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<tr>
<td>Gender Male/Female (n)</td>
<td>1/4</td>
<td>1/5</td>
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<tr>
<td>WHO-Functional class</td>
<td>2 (2.2)</td>
<td>2 (2.2)</td>
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<td>RVSP (mm Hg), mean ± SD</td>
<td>97.4 ± 11.5</td>
<td>85 ± 16.5</td>
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<td>TAPSE (mm), mean ± SD</td>
<td>14 ± 0.7</td>
<td>15 ± 0.8</td>
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<td>6MWD (m), mean ± SD</td>
<td>267.4</td>
<td>359.5</td>
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Adherence to the exercise program: 52.8 ± 8.5%

DISCUSSION

Exercise training in this study did not find any statistically significant difference between the groups – though there were changes within the groups. In PH, exercise training has shown great improvements in functional capacity and quality of life when delivered through a hybrid delivery model.3 In patients with congenital heart diseases, studies have shown significant benefits with exercise training with congenital heart disease.4 In Eisenmenger’s syndrome, there are only a few studies till date that have shown similar benefits.3,5 Nevertheless, the improvements in functional capacity was higher than a previous study.6 Nevertheless, the study by Becker-Grugel et al., demonstrated higher levels of improvement in 6MWD which could be attributed to the hybrid model of delivery.7 This model however may not have easily applicable across various economies and cultures.8 Adherence to the program was lower than has been reported with home based exercise training from this region in heart failure.9 This could impact the findings of this study and will need to be addressed in future studies.

CONCLUSION

Data from this secondary analysis suggests a trend towards improvement in functional capacity and quality of life (with mental component improvements more than physical components). No change in cardiac function was observed. This study paves way for more focused research on Eisenmenger’s syndrome using a home-based delivery model.

ACKNOWLEDGEMENT

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REFERENCES