The benefits of Exercise Training in improving cardiovascular fitness, in patients with known Coronary Artery Disease at the King Abdulaziz-Cardiac Centre Riyadh.

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Other Information

Disclosure: None
Background

- Cardiovascular disease (CVD) is the leading cause of mortality in developed countries (1).
- Coronary Heart Disease (CHD) accounts for more than 50% of these deaths (2).
- Coronary Heart Disease and Hypertension are responsible for an estimated 26% mortality in Saudi Arabia (3).
- Cardiac rehabilitation programs implemented by healthcare professionals in western culture, have been well received as an important method to manage patients with CAD and HF (4).
Background

• LDL and Triglycerides are positively related to an increase in BMI and Waist Circumference \(^{(5)}\).
• Subjects who exercised for half an hour, 5 days a week have a higher HDL and a lower LDL, compared with those who do not exercise \(^{(5)}\).
• People who are less active and less physically fit have a 30%-50% greater incidence of hypertension than their more active peers \(^{(6)}\).
• A low resting HR reflects good health, whereas higher values are related to higher risk mortality \(^{(6)}\).
Venue

- The clinic is part of the Cardiovascular Disease Management Program at National Guard Hospital (NGHA) “King Abdul-Aziz Cardiac Centre”, Riyadh.
- This clinic’s primary focus is on risk factor stratification through education and lifestyle management.
- This is achieved by delivering a multidisciplinary approach to each individual through education and guidance of appropriate lifestyle changes.
Definitions

• Cardiac Rehabilitation Program: Is a Nurse Led, Physician supervised program.

• Phase I: Inpatient Education/Emotional Support.

• Phase II: Lifestyle modification/changes that promote a healthy lifestyle and exercise

• Phase III: Monitoring of independence.

• Phase IV: Independence.
Exercise Program Phase II

Phase I

Pre
- Screening Visit/Blood Test
- Pre Conditioning Stress Test
- Pre Conditioning Six min Walk Test

Conditioning
- Cardiovascular Training on a Treadmill x 2 session per week.
- Encourage patient to exercise at home 1-3 sessions per week
- Reinforcement of education x 2 sessions per week

Post
- Post Conditioning Stress test
- Post Conditioning Six Min Walk Test
- Advancement to phase III

Phase III
Hypothesis

**Question:** Does exercise training improve cardiovascular fitness and benefit patients with known Coronary Artery Disease?

Hypothesis: Exercise training improves cardiovascular fitness and benefits patients with known Coronary Artery Disease.

Null hypothesis: Exercise training does not improve cardiovascular fitness and does not benefit patients with known Coronary Artery Disease.
Primary Objectives of lifestyle modification program:

- 1. Increase Cardiovascular fitness (functional Capacity) via exercise training.
Study Objectives

Secondary objectives:
• Decrease LDL
• Decrease Total Cholesterol
• Decrease Triglycerides
• Increase HDL
• Decrease Waist Circumference
• Decrease BMI
• Decrease Resting Systolic / Diastolic BP
• Decrease Resting HR
Methodology/Characteristics

- A prospective pilot study.
- 17 patients with CAD underwent 12 weeks of individualized ET.
- Patients completed a 6 minute walk test and stress test prior to exercise training and again upon finishing the 12 week program.
Consent
• Consent was obtained from each participant to use the data collected during the time frames specified.

Inclusion Criteria
• Saudi Nationals, living in Saudi Arabia.
• Who have suffered a recent episode of Acute Coronary Syndrome followed by appropriate Surgical/Revascularization/ Medical treatment (within the last twelve months).
• Willingness to make a lifestyle change.
Statistical Analysis

- The data was collected pre and post exercise training and was compared using the two tailed t-test. (Comparison of pre and post stress test and 6min walk test after ET)

- These results were Compared using SPSS 19 for windows.
Follow Up and Outcome

- The patients will continue to advance through the program from phase 1 to phase 4.
- Continual evaluation of each individual patients variable ensure appropriate follow up.
Demographic

- Out of the 17 patients inducted into the program
- 14 were Male (83%)
- 3 were Female (17%)
- Mean Age of 56 ± 7.67.
Experienced Drop Out Rate.

- Complete CRP/LSM: 8
- Dropped out of program: 3
- Complete program at later date: 6
Attendance & Drop Out

- Less than 17% of the initial participating group were female. They displayed a dropped out rate of 100% prior to completion of the program.
- The male participants represented 83% of our study. They experienced a drop out rate of 42%.
- Of the 68% of males who completed the program the average number of missed session for the total 24 week period was 5.50 ± 5.18 sessions.
## Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pre Program/Mean ± St Dev</th>
<th>Post Program/Mean</th>
<th>p Value &lt; 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resting HR (BPM)</td>
<td>60.00 ± 6.34</td>
<td>61.5 ± 9.68</td>
<td>0.71</td>
</tr>
<tr>
<td>Resting SBP (mmHg)</td>
<td>136.00 ± 9.79</td>
<td>123.37 ± 11.45</td>
<td>0.03</td>
</tr>
<tr>
<td>Waist Circumference (cms)</td>
<td>108.57 ± 11.24</td>
<td>102.06 ± 9.86</td>
<td>0.33</td>
</tr>
<tr>
<td>Weight (Kgs)</td>
<td>81.85 ± 14.44</td>
<td>80.87 ± 12.71</td>
<td>0.88</td>
</tr>
</tbody>
</table>
## Results

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</thead>
<tbody>
<tr>
<td>6 Min Walk Test (mtrs)</td>
<td>425.85 ± 62.44</td>
<td>492.41 ± 88.42</td>
<td>0.10</td>
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<tr>
<td>Maximum Metabolic Equivalents Achieved (Mets)</td>
<td>9.71 ± 2.46</td>
<td>11.17 ± 1.53</td>
<td>0.18</td>
</tr>
<tr>
<td>Maximum Heart Rate (BPM)</td>
<td>134.63 ± 13.60</td>
<td>143.37 ± 16.46</td>
<td>0.27</td>
</tr>
<tr>
<td>Body Mass Index (BMI)</td>
<td>28.77 ± 5.04</td>
<td>28.63 ± 5.04</td>
<td>0.96</td>
</tr>
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</thead>
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<tr>
<td>High Density Lipoproteins (mmol/L)</td>
<td>0.91 ± 0.23</td>
<td>0.83 ± 0.18</td>
<td>0.42</td>
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<tr>
<td>Low Density Lipoproteins (mmol/L)</td>
<td>2.02 ± 0.57</td>
<td>2.08 ± 0.60</td>
<td>0.31</td>
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<tr>
<td>Triglycerides (mmol/L)</td>
<td>1.64 ± 0.83</td>
<td>1.70 ± 0.49</td>
<td>0.78</td>
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<tr>
<td>Total Cholesterol</td>
<td>3.81 ± 0.85</td>
<td>3.50 ± 0.90</td>
<td>0.24</td>
</tr>
</tbody>
</table>
Limitations

- The variance associated with different training intensities.
- Dietary intake.
- Amount of home initiated exercise.
- Varying levels of patient education.
- Compliance to clinical visits.
- Recording of subjective observational data.
- Transport for women.
Implemented Changes

- Follow up phone calls to increase attendance.
- Documentation of exercise intensity charts.
- Environmental control to minimise variance in collection of subjective data.
- Ongoing education check list to increase understanding of disease.
- Auditing of training sessions/educations sessions.
Conclusion

- The effects of exercise training in a Saudi population does not currently show significant benefit towards reducing the risk factors associated with ongoing cardiac disease. However, marked improvements in Mean functional capacity were evident suggesting that further research must be conducted on a larger scale to make any definitive conclusion.
- The extreme drop out rate experienced in the female demographic must be addressed.
- Community awareness and validity of such programs must be heightened.
Future Directions

- The Effectiveness of a ‘follow up’ phone call on the high drop out rates associated with the Cardiac Rehabilitation Program.
- The Effectiveness of incremented interval training for achieving target heart rates.
- Transport for women
- Shopping excursions to help control diet.
- Recruitment of more specialists eg. Dietician/Psychotherapist.
References


