Preoperative Exercise Training Prior to AAA repair: It Improves Outcomes

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Veith Symposium: November 2017
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Declarations

Recipient of £245,000 Research for Patient Benefit Grant (NIHR) for HITAAA study as Chief Investigator

The Concept

The perioperative period

Pre-habilitation

Complications  
Hospital LOS  
Health costs  
Physical function

Prehabilitation

Complications  
Hospital LOS  
Health costs  
Physical function

Adapted from: Clegg et al. Frailty in elderly people. Lancet. 2013; 381 (9868): 752-762
The Evidence

124 patients:  E = 62  UC = 62

Outcomes
• Primary - composite of complications (cardiac, pulmonary, renal)
• Secondary – mortality, HLOS, CCLOS

Exercise intervention
• 6 weeks immediately preoperatively
• X3 per week (1 hour per session)
• Aerobic (MCT) + resistance training

Results
• Similar patient characteristics and procedures
• Significant fitness improvement (sub-set only assessed)

<table>
<thead>
<tr>
<th></th>
<th>Exercise</th>
<th>Control</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complications</td>
<td>14 (26%)</td>
<td>26 (42%)</td>
<td>0.021</td>
</tr>
<tr>
<td>Mortality</td>
<td>2 (3.2%)</td>
<td>2</td>
<td>NS</td>
</tr>
<tr>
<td>Median (IQR) HLOS</td>
<td>7 (5 – 9)</td>
<td>7 (6 – 12)</td>
<td>0.025</td>
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• No difference CCLOS or re-operation
• No exercise-related adverse events

BJS 2017. DOI: 10.1002/bjs.10669
Study aims

- Feasibility study
- Evaluate HIIT AAA patients
  - safety
  - compliance
  - fitness benefits
  - enjoyment
- Evaluate primary outcome for definitive study
  - M+M
  - HLOS
  - cost-effectiveness
  - HRQOL

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4 x 4 or 8 x 2 intervals = 16' HIIT per session

Total exercise = 40' per session

• 4 weeks pre-surgery (x3/week)
• Supervised
• Hospital-based

Results

- 53 recruits (E = 27, C = 26)
- 63% preference exercise

Exercise:
- 74% attendance (>9/12 sessions)
- Enjoyment levels high
- No SAEs

Outcomes:
- No deaths at 30 days
- Complications and LOS similar
- Increased readmissions control group

Health Economics:
- Increased HRQOL at 12/52 exercise
- 4% uplift in total cost with exercise
- Preliminary cost-effectiveness (QALY)
In Summary

Encouraging preliminary evidence that exercise prior to AAA repair:

• Improves fitness (non-responders)
• Has a low adverse event rate
• Reduces perioperative complications
• Improves HRQOL up to 12 weeks post-surgery
• Is cost-effective

• Optimal program multimodal:
  - Strength training
  - IMT
  - Rehabilitation phase