**Left Ventricular Assist Device (LVAD)**

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**Objectives**

- To recognize the significance of investigating therapy implications for patients with LVADs.
- To be able to discuss relevant literature/evidence in regards to cardiac rehab outcomes for patients with LVADs.
- To summarize recent literature/evidence in regards to whether they conclude if therapy protocols should be implemented for patients with LVADs.

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**PICO Question:**

In patients with continuous-flow left ventricular assist devices (LVAD), does cardiac rehabilitation have better outcomes for improving functional capacity compared to patients receiving standard care?

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**Left Ventricular Assist Device (LVAD)**

A LVAD is an implanted mechanical pump that helps the left ventricle pump blood to the aorta. Used for patients in end-stage heart failure as:
- Bridge to recovery/stabilization
- Bridge to transplant
- Destination therapy

Functional capacity and quality of life are improved after LVAD insertion, but still lower than age matched patients receiving heart transplants. 1,2,3,4

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**Significance to Physical Therapy**

- Improved, but still limited exercise tolerance, VO2 max and quality of life after LVAD implantation.
- Compared to patients after heart transplants
- Physical therapy may be able to help improve these areas.
- No specific protocols for LVAD rehabilitation, using protocols for other cardiac conditions and surgeries.
  - Opportunity to create PT specific protocols for this population
  - Opportunity to create PT specific education for this population
  - Limited number of studies about effects of rehabilitation on patients with LVADs.

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**2014 Randomized Controlled Trial**

- 6 week study to determine impact of cardiac rehab on cardio respiratory fitness, muscle strength and health status.
- 26 participants with LVAD implanted within past 1 to 6 months.
- Experimental group participated in 30 min aerobic training at 60 - 80% of HR reserve 3 days a week. Control group instructed to walk daily.
- Results:
  - No significant differences between groups.
  - Significant improvement in peak VO2 in experimental group with improved 6MW distance, leg strength and heart rate recovery.1
2015 Literature Review

• Limited research on effects of aerobic and resistance training in patients with LVADs.
• Studies reviewed were performed 2 to 6 months after implantation creating a need longer term studies.
• More LVAD specific studies needed to determine which interventions would increase functional capacity and quality of life the most.
• LVADs improve hemodynamics at rest, but unable to provide full support during exercise.²

2012 Randomized Controlled Trial

• 8 week study to examine effect of cardiac rehab on exercise capacity, 6MW distance and quality of life.
• 14 participants with LVADs as a bridge to heart transplants.
• Experimental group participated in 1 hour of training (30 min aerobic, 30 min strength) 3 days a week. Control group instructed to walk minimum 5 days a week at 13 on BORG RPE scale.
• Results:
  • Significant increase in peak VO₂, peak workload, and 6MWD in both groups.
  • No significant differences between groups, but trend toward greater improvements in exercise group.³

2010 Outcomes Study

• Previously collected data.
• Patients undergoing either bridge to transplantation (n=281) or destination therapy (n=374).
• Outcome measures:
  • Functional status (NYHA functional class, 6-min walk, pt activity scores) & QOL (MLWHF, KCCQ) collected before & after LVAD.
• Results:
  • Majority (79%) showed improvements in functional status as indicated by NYHA (all either class I or II).
  • Overall increase in QOL scores.
  • No evidence of any decline in either group in 2-year follow-up.⁴

Conclusions

• Moderately conclude cardiac rehab improves functional capacity for patients with LVAD better than current standard care.
• Strongly conclude cardiac rehab does not impose harm, and evidence indicates it is beneficial.
• Further research needed to determine impact of cardiac rehab specifically for patients with LVADs.
• Great opportunity for further research to provide protocols specific to LVAD rehabilitation.
• Long term studies needed to track improvements over time.

References


Questions?

Thank You!