Increasing Physical Activity in Post Liver Transplant Patients

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Background

- Quality of life (QOL) improves after liver transplant (LT) but inferior to general population
- Liver transplant patients often debilitated, muscle wasted, deconditioned
- After transplant, immunosuppressive agents like Prednisone contribute to weight gain
Background

- Survival rates 80%-90%
- QOL a key focus
- Exercise in chronic diseases $\rightarrow$ Higher QOL
- Exercise in liver transplant $\rightarrow$ Higher QOL
Clinical Problem

♦ Physical Therapy: Transfers & Ambulation

♦ Discharged in as little as 4-5 days

♦ Nonspecific Discharge Activity Instructions

♦ Lack of Accountability

♦ Walking Rx and Daily Activity Log
Purpose of the Project

- Assess & Apply Evidence
- Physical Activity Recommendations
- Evaluate the Results
- To increase physical activity among adult liver transplant patients to improve their quality of life (QOL).
PICO Question

- Do adult liver transplant patients (P) who engage in regular physical activity (I) as compared to their sedentary counterparts (C) enjoy a higher quality of life (O)?
Search Strategy

♦ 1,379 Studies

♦ Search Terms: Liver Transplant, Quality of Life, Exercise, Physical Activity

♦ Databases: CINAHL, Cochrane Library, Academic Search Complete, Science Direct, and Medline-Proquest.
Search Strategy

- Included: PICO question, English, 2000-2014
- Excluded: Wrong patient population, research only on QOL or only on physical activity, and lower level studies.
- Seminal Studies
Literature Review

♦ Seven studies: One RTC, one non-randomized interventional pre-post study, two case-control, and three cross-sectional

♦ Purpose: Physical Activity & QOL in LT patients

♦ 3 in Netherlands, 2 in US, 1 in Poland, 1 in Italy
Literature Review

- Total Sample Size: 539 patients ($n=16-180$)
- Length of time since transplant: 2 mos-17 yrs
- Transplant patients share commonalities
- SF-36 or RAND-36 to measure QOL
- Measurement of Physical Activity:
  - Direct Observation
  - Patient Report
# Studies by Level of Evidence

<table>
<thead>
<tr>
<th>Level of evidence</th>
<th># of Studies</th>
<th>Study</th>
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<tbody>
<tr>
<td>II – RTC</td>
<td>1</td>
<td>Krasnoff et al. (2006)</td>
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<td>III – Non-randomized</td>
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<td>1</td>
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<td>Masala et al. (2012)</td>
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<td>van den Berg-Emons (2006b)</td>
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<td>Painter et al. (2001)</td>
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<td>Rongies et al. (2011)</td>
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<td>van Ginneken et al. (2007)</td>
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SF-36/RAND-36

Four Physical Scales:
- Physical Functioning
- Role-Physical
- Bodily Pain
- General Health

Four Mental Scales:
- Vitality
- Social Functioning
- Role-Emotional
- Mental Health

Physical Composite & Mental Composite
Synthesis of Findings

- All found significant improvement in ≥2 scales
- 4/7 studies w/ signif improvement in ≥4 scales
- 6/7 studies w/ signif. improvement on the Physical Functioning (PF) scale (10/36 questions)
- 4/7 studies w/ signif. Improvement in the General Health (GH) scale (5/36 questions)
- PF scale most weighted; GH 2nd most weighted
**QOL Improvement per Scale**

**Significant Improvement in QOL per scale of the SF-36/RAND-36 for each study**

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Implications of the Evidence

♦ Consistent findings

♦ Regular physical activity $\rightarrow$ higher QOL with supervised and home-based programs
Project Purpose, Setting & Design

- **Purpose:** Increase physical activity among post-op adult LT patients, improve documentation of daily activity, and ultimately influence QOL

- **Clinical Setting:** Mayo Clinic, Jacksonville

- **Study Design:** Single-subject, with every participant serving as his or her own control
Population

- Population: Adult Liver Transplant recipients who are between 5 and 21 days post surgery.

- Exclusion criteria were as follows: patients with active infections, with encephalopathy, with severe debility or who require assistance to ambulate.
Procedure

- Details of project explained to potential candidates
- Participation completely voluntary
- Written informed consent
Procedure

- Benefits of engaging in regular activity
- 5 A’s Behavior Change Model
  - Assess
  - Advise
  - Agree
  - Assist
  - Arrange
Procedure

♦ Assess level of physical activity & QOL
  • International Physical Activity Questionnaire (IPAQ)
  • QOL on scale of 1-10

♦ IPAQ
  • 7 items to calculate MET score
  • Minutes & days spent during prior week in vigorous activity, moderate activity & walking
  • $MET = 8 \times VA(d \times min) + 4 \times MA(d \times min) + 3.3 \times W(d \times min)$
Procedure

• Advise & Agree to engage in physical activity:
  • Walk 5-10 minutes each day. Increase your walking by 5 minutes every 3 days. Your goal is to reach 30 minutes of walking for at least 5 days per week.

• Assist patient to incorporate walking program
  • Activity Log

• Arrange for follow-up
Procedure

- IPAQ and QOL question at 6 weeks & 4 months
- Activity log at 6 weeks & 4 months
- De-identified data
Data Collection

- Demographic information
- Length of hospital stay
- Indication for transplant
- Comorbidities
- ICU stay required?
- MELD score
- IPAQ & QOL scores at baseline, 6w & 4m
- Activity Logs to explore patterns
Data Analysis

- JMP Pro version 9.0.1
- Descriptive stats
- Wilcoxon Matched-Pairs Signed Ranks
Protection of Human Subjects

♦ Mayo IRB #13-004699

♦ UNF IRB agreement with Mayo
Results

- 12 participants initially enrolled:
  - Eight (2 women & 6 men) completed thru 6 weeks and six (1 woman & 5 men) completed thru 4 mos.
  - Avg age of 60
  - All within 7 days post LT
  - Indications: HCV, Caroli’s, fatty liver, alcohol, cholangiocarcinoma, HCC
  - MELD avg 25
  - Comorbidities: HTN, Kidney Disease
  - 3 required ICU stay
  - LOS avg 7 days
Results: Physical Activity

♦ IPAQ MET median scores:

* Baseline 407.5
* 6 weeks 1711.5
* 4 months 1935.75

♦ Wilcoxon Signed-Rank test: No signif change in median MET; however, median MET scores increased as a whole by >400%
Minutes of Walking over 4 months
Minutes of Daily Physical Activity over Six Weeks
Results: QOL

- QOL score at BL 5.5
- QOL score at 6 weeks 8.25
- QOL score at 4 months 8.3
- Wilcoxon Signed Ranks test: Significant improvement in mean QOL score (p=.027)
Discussion

- Physical Activity increased
- Patients mobilized to act
- QOL improved
Discussion

- Timing of Walking Program
- Early ambulation → fewer complications
- Close follow-up
- Real-time feedback
Discussion

- Strengths and Limitations
- Pilot project
- Evidence-based practice
- 83% recorded their walking part of the 6 weeks, 66.6% recorded walking for 6 weeks, and 50% recorded walking for 4 months
Conclusions

“With extensive resources (that is, professional, technical, financial, and emotional) utilized to bring each liver transplant into fruition, clinicians must commit themselves to optimizing each patient’s QOL and clinical outcomes.”
References


