A SUPERVISED VERSUS HOME-BASED EXERCISE PROGRAM EFFECTS ON LIVER TRANSPLANTED FAMILIAL AMYLOIDOTIC POLYNEUROPATHY PATIENTS: WALKING, FATIGUE AND QUALITY OF LIFE.

Mª Teresa Tomás¹,²; Helena Santa-Clara ¹; Estela Monteiro ³; João Gil ⁴; Paula Marta Bruno ¹; Eduardo Barroso ³; Luís Sardinha ¹

¹ Faculty of Human Movement at Lisbon Technical University
² Lisbon Higher School of Health Technology at Lisbon Polytechnique Institute
³ Hepatobiliarypancreatic and Transplantation Centre at Lisbon Curry Cabral Hospital
⁴ Coimbra Higher School of Health Technology at Coimbra Polytechnique Institute
FAMILIAL AMYLOIDOTIC POLYNEUROPATHY

Autosomal neurodegenerative disease

Systemic deposition of amyloidal fibre mainly on peripheral nervous system (but also in other systems like heart, gastrointestinal tract, kidneys, etc) and mainly produced in the liver

Liver

Transplantation

Agressive medication for muscle and bone metabolism

Previous impairments

Surgery process

North of Portugal
Both FAP and Transplantation result in functional limitations which may be ameliorated by exercise training, but the effects of exercise training in FAP patients after a liver transplant is currently unknown.
To evaluate the effects of a six months exercise training program (supervised or home-based) on walking capacity, fatigue and health related quality of life (HRQL) on Familial Amyloidotic Polyneuropathy patients submitted to a liver transplant.
48 patients

Control Group (CG)  
N=23  
18M; 5F

Home-based group (HB)  
N=16  
4M; 12F

Supervised Exercise Group (SEG)  
N=9  
6M; 3F

Dropout’s 1 - cerebrovascular accident  
6 – Miss second assessment

Dropout’s 1 - not answering to feedback’s

CG  
N=16  
13M; 3F

HB  
N=15  
4M; 11F

SEG  
N=8  
5M; 3F

First assessment

Second assessment
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>SEG</th>
<th>HBG</th>
<th>CG</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(5M; 3F)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td>34.7 (28-48)</td>
<td>35.5 (28-44)</td>
<td>33.9 (23-59)</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Weight (kg)</strong></td>
<td>60.0 16.9 (49.8-101.2)</td>
<td>61.2 12.7 (35.6-75.8)</td>
<td>66.1 11.7 (49.6-95.4)</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Height (m)</strong></td>
<td>1.71 0.09 (1.56-1.81)</td>
<td>1.66 0.08 (1.53-1.85)</td>
<td>1.71 0.08 (1.56-1.83)</td>
<td>NS</td>
</tr>
<tr>
<td><strong>BMI (kg.m⁻²)</strong></td>
<td>20.4 4.5 (16.6-30.9)</td>
<td>22.3 4.3 (15.2-30.6)</td>
<td>22.6 3.3 (18.0-28.5)</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Prednisone (mg/day)</strong></td>
<td>11.6 8.1 (0.0-20.0)</td>
<td>12.8 4.1 (5.0-20.0)</td>
<td>9.5 4.4 (0-15.0)</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Tacrolimus (mg/day)</strong></td>
<td>4.9 1.7 (3.0-8.0)</td>
<td>6.3 2.6 (3.0-12.0)</td>
<td>6.0 2.0 (2.0-8.5)</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Post-TX time (months)</strong></td>
<td>4.3 3.3 (2-10)</td>
<td>3.1 1.2 (2-6)</td>
<td>4.2 1.4 (2-7)</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Impatient time (days)</strong></td>
<td>14.5 3.4 (11-22)</td>
<td>20.1 13.1 (12-64)</td>
<td>15.9 4.9 (9-28)</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Time referred since first symptoms</strong></td>
<td>26.4 16.7 (10.0-60.0)</td>
<td>57.0 48.4 (12.0-180.0)</td>
<td>27.8 16.3 (11.0-72.0)</td>
<td>0.021</td>
</tr>
</tbody>
</table>

**Methods**

- Combined exercise 3x/week; ≈60min
- Combined exercise 3x/week AT HOME
- NO EXERCISE
6 Minutes Walk Test

Walking Capacity

Multidimensional Assessment of Fatigue Questionnaire (MAF)

Medical Outcome Study-36 item Questionnaire (SF-36)
24 week’s; 3x/week; ≈60min; low or moderate intensity (RPE<15)

AEROBIC EXERCISE –
Treadmill, bicycle, rowing, walking and other exercises

STRENGTH TRAINING – Thera-band equipment; body weight; etc; 8-12 rep’s; 6-8 exercises

SENSORIOMOTOR TRAINING –
Thera-band equipment
HOME-BASED
- 6 Book’s of exercises
- Feed-back’s every 15 days (phone, mail, letter or in presence)
- Intensity or volume change every 15 days
- Different exercises, Thera-Band equipments, resistance and intensity every month

Exercise prescription was similar for both groups of exercise.
DIFFERENCE variable was created (post-intervention – pre-intervention)

ONE-WAY ANOVA or Kruskall-Wallis with post-hoc’s tests.

p<0,05

SPSS Statistics 17.0 for Windows®, SPSS Inc, Chicago, USA
### Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cont Gr (13M; 3F)</th>
<th>SupEx Gr (5M; 3F)</th>
<th>HB Gr (4M; 11F)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Diff</td>
<td>Diff</td>
<td>Diff</td>
</tr>
<tr>
<td>Weight a</td>
<td>0.07(1.7)</td>
<td>6.1(4.7)</td>
<td>1.5(4.9)</td>
</tr>
<tr>
<td>BMI a</td>
<td>-0.03(0.6)</td>
<td>2.0(1.6)</td>
<td>0.6(1.9)</td>
</tr>
<tr>
<td>Tacrolimus</td>
<td>-1.2(1.1)</td>
<td>-0.7(0.7)</td>
<td>-2.3(2.6)</td>
</tr>
<tr>
<td>Prednisolona</td>
<td>-8.4(5.1)</td>
<td>-7.2(5.6)</td>
<td>-8.7(3.6)</td>
</tr>
<tr>
<td>6MWT (m)</td>
<td>51.6(31.1)</td>
<td>73.4(44.8)</td>
<td>48.7(42.4)</td>
</tr>
<tr>
<td>Walking Capacity (Kg.Km) a</td>
<td>3.4(2.5)</td>
<td>7.9(3.5)</td>
<td>3.8(4.2)</td>
</tr>
<tr>
<td>Global Fatigue Index (GFI)</td>
<td>-1.9(7.7)</td>
<td>-1.2(7.3)</td>
<td>-0.4(5.2)</td>
</tr>
</tbody>
</table>

Values expressed as mean(SD)

*a* Difference between groups for Diff (post value – pre value) variables (p<0.05);
Cont Gr – control group; SupEx Gr – Supervised exercise group; HB Gr – Home-based group;
BMI – Body Mass Index; 6MWT – six-minute walk test; GFI – Global Fatigue Index (MAF scale)
Only for **Supervised Exercise Group**, total body weight (p=.004) and BMI (p=.008) increased significantly.*  

* p<.05
Neither groups had significantly changed. However, only **Supervised Exercise Group** increased more than the minimal clinical significant change (>70m or >54m).

Only for **Supervised Exercise Group** WCp increased significantly (p=.012)
Although differences, neither groups have reported significant changes in fatigue.
### Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cont Gr (13M; 3F) Diff</th>
<th>SupEx Gr (5M; 3F) Diff</th>
<th>HB Gr (4M; 11F) Diff</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF36-PF</td>
<td>11.3(14.1)</td>
<td>8.8(12.2)</td>
<td>6.7(18.0)</td>
</tr>
<tr>
<td>SF36-RP</td>
<td>17.2(28.5)</td>
<td>43.8(41.7)</td>
<td>40.0(43.1)</td>
</tr>
<tr>
<td>SF36-BP</td>
<td>9.9(15.5)</td>
<td>-3.9(18.0)</td>
<td>-2.9(24.2)</td>
</tr>
<tr>
<td>SF36-GH</td>
<td>1.7(5.7)</td>
<td>-1.4(14.5)</td>
<td>0.4(16.4)</td>
</tr>
<tr>
<td>SF36-VT</td>
<td>4.1(14.0)</td>
<td>5.0(12.5)</td>
<td>0.7(11.5)</td>
</tr>
<tr>
<td>SF36-SF</td>
<td>5.5(18.8)</td>
<td>15.6(14.6)</td>
<td>5.8(22.6)</td>
</tr>
<tr>
<td>SF36-RE</td>
<td>-2.1(31.0)</td>
<td>20.8(30.5)</td>
<td>8.9(36.7)</td>
</tr>
<tr>
<td>SF36-MH</td>
<td>2.3(8.3)</td>
<td>2.5(12.8)</td>
<td>2.4(15.0)</td>
</tr>
<tr>
<td>SF36-RHT</td>
<td>-0.7(1.3)</td>
<td>-1.3(1.2)</td>
<td>-0.5(0.6)</td>
</tr>
</tbody>
</table>

Values expressed as mean(SD)

*Difference between groups for Diff (post value – pre value) variables (p<0.05);
Cont Gr– control group; SupEx Gr– Supervised exercise group; HB Gr – Home-based group;
BMI – Body Mass Index; 6MWT – six-minute walk test; GFI – Global Fatigue Index (MAF scale)
Neither of groups reported significant changes in HRQL due to exercise programm, although **SupExGroup** as shown a clinically important change in role emotional (>16.7 points)
Levels of Physical Activity

Moderate Intensity Activities (but not High Intensity Activities) had changed significantly (p=0.003) for all groups.
Levels of Physical Activity

All groups had changed significantly the number of days ($p=\cdot.001$) and the time in minutes per day ($p=\cdot.006$) they spend with strength and flexibility exercises.

Should be 2d/W
**Supervised exercise** is more effective than home-based exercise in improving WCp in liver transplanted patients

Although not significant, HBGr has presented higher values for difference in WCp than ContGr with a better functional exercise level for daily physical activities.
It seems that clearly these patients benefit from an exercise training program. However, this exercise program has not changed fatigue levels and HRQL.
OBRIGADO

THANK YOU

mttomas@fmh.utl.pt

teresa.tomas@estesl.ipl.pt