Determination of the effectiveness of a Community Based Exercise program, Tai Chi, for people with Multiple Sclerosis, a pilot program

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Objectives

• Integrate rehabilitative strategies into the multidisciplinary management of the sequelae of MS which promote improvements and optimize function and quality of life
• Identify MS-specific screening techniques that facilitate individualized and targeted rehabilitation services
• Discuss outcome measures for determination of balance and strength deficits, and balance confidence
• Discuss the use of Tai Chi for improvement in balance deficits in people with MS

• No disclosures
Introduction

• Balance deficits identified in people with mild MS (Denommé 2014, Gunn 2013)
  • Risk for fall
  • Loss of confidence
  • Impairments associated with increased fall risk
    • Weakness
    • Impaired sensation
    • Fatigue
    • Visual deficits

Core beliefs related to exercise

• Cycle of activity/inactivity
  • Emotional responses associate with past experience with exercise
  • Fatigue
  • Perceived cost of exercise
• Line of benefit and harm
  • Physical activity makes MS worse
  • Physical activity waste of time
  • State of disease versus wellness
  • Knowledge of trained personnel
• Participation in exercise remains low
Purpose

• The use of community based Tai Chi program to improve
  • Balance
  • Gait
  • Reduce fall risk
  • Community setting chosen for ease of continuation of the program
• Setting Mind Set Assisted Physical Training
  • Personal training program for people with MS
  • No cost /supported by NMSS

Methods

• 25 people recruited from support groups, neurologists, Mind Set Assisted Physical Training gym
• 15 people returned for post-testing
• Inclusion criteria
  • Definite diagnosis of MS
  • Ages 18-75
  • Able to read and sign consent to participate form
  • Attend pre and post-testing
  • Complete 2 x per week x 6 week Tai Chi
Pre/Post-Testing

- Berg Balance Scale (BBS) static balance
- Fatigue Severity Scale (FSS) self report measure of fatigue
- Timed Up and Go (TUG) dynamic timed balance
- Dynamic Gait Index (DGI) dynamic balance measure during gait
- Activities Specific Balance Scale (ABC) self report balance confidence
- Two Minute Walk Test (2MWT) endurance gait measure
- Five Times Sit to Stand (5TSTS) LE strength

Results

<table>
<thead>
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<th></th>
<th>Z</th>
<th>Asymp. Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBS post - BBS pre</td>
<td>-2.940b</td>
<td>.003</td>
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<tr>
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</tr>
<tr>
<td>5TST post - 5TST pre</td>
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a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.
c. Based on positive ranks.
Discussion

• Demographics
  • Mean age 59.3
  • 73% woman
  • 66% used assisted device
  • 3 people had progressive forms of MS
  • Average length of MS 21 years

Benefit of Tai Chi

**Improvements**

- BBS: p=0.003
- FSS: p=0.023
  - Mean:43.7 pre and 35.8 post
  - > 36 indicates severe
- TUG: p=0.018
- 5TSTS: p=0.003
  - Strength LE
- 2 MWT:p=0.018
  - Endurance gait

**No Change**

- DGI: p=0.345
  - Dynamic balance during gait
  - Variety of tasks
  - No walking in Tai Chi
- ABC: p=0.673
  - Confidence in balance
Fall Risk

Pre-test

- BBS: 37.00 Risk for falls
  - MCD=6 (Godi, 2012)
- TUG: 13.5 Risk for falls
  - 48.51
  - MCD=24%
- 5TSTS: 32.93 secs Risk for falls
  - Cut off > 16 secs risk for falls
- 2MWT: 212.60 ft
  - MDC=63.02 feet

Post-test

- BBS: 40.73
  - 3.73 change
- TUG
  - 46.24
  - 4.8% change
- 5TSTS: 24.40 (8.53 secs)
  - Risk for falls
- 2MWT: 238.13
  - 25.53 feet

Identified benefit

- All levels of MS allowed in study
- Began in a chair, end of 6 weeks, all were standing during Tai Chi class
- 5TSTS improved which probably led to improvement in TUG
  - Both have sit to stand
  - LE strength improved
- BBS improved, improvement in static balance but not in dynamic balance (DGI)
  - Tai Chi is balance in standing and weight shifting
Identified benefit

- FSS improved and mean post-testing was 35.8
  - Just barely below severe ranking
  - Fatigue continues to be challenge
- 2MWT
  - Did not meet 63 feet MDC
  - Balance confidence didn’t improve
  - Tai Chi does not have a gait component
  - Training is task specific (Nadeau, 2013)

Suggestions/Limitations

- Limitations
  - Small cohort
  - Short time frame (6 weeks)
  - No control group
  - No long term follow up
- Suggestions
  - Longer length of intervention: 12 weeks
  - Control group
  - Long term follow up
Thanks to

- Travis Ehrhardt at Mind Set Assisted Physical Training
  - Space, Support, Encouragement
- National Multiple Sclerosis Society
  - Assistance with recruiting
- All of the people with MS who are willing to try new activities


