Tai Chi as a Form of Vestibular Rehabilitation
Paul S. Lee1, Matthew Jung2, Anu Abraham1, Laura Lei-Rivera1, Ana H. Kim1,2

1Department of Otolaryngology-Head and Neck Surgery, New York Eye and Ear Infirmary, New York, NY; New York Medical College, Valhalla, NY, NY.

INTRODUCTION

An estimated 50% of the population experience balance difficulty,1,2 resulting in approximately 3 million physician visits per year in the United States.3 Vestibular rehabilitation therapy is an evidence-based treatment for those with a history of vestibular disease.4,5 Patients with dizziness related disorders benefit from an interdisciplinary approach that utilizes vestibular and somatosensory retraining,6-8 as well as education and lifestyle modification.9-11 In addition, patients may benefit from alternative and complementary therapies.12-14 Tai Chi, a form of martial art, has been used to promote health and well-being.15-17 The most commonly practiced style of Tai Chi employs the so-called “soft” or “internal” techniques, which focus on internal balance and harmony.18-20 Tai Chi training consists of teaching basic movement exercises aimed at increasing balance and coordination,21-24 improving fine motor skills,25-27 and enhancing the connection between the brain and body.28-30 Tai Chi is practiced by millions of people in the United States3-4. In addition, vestibular dysfunction has been reported in patients with Parkinson’s disease31 and other neurodegenerative diseases32-33 and in individuals without a definitive vestibular diagnosis.34

METHODS AND MATERIALS

Subjects and Methods

A total of 21 vestibular patients underwent an 8-week Tai Chi vestibular rehabilitation program. Patients were recruited through the Department of Otolaryngology–Head and Neck Surgery at our institution. Participants were surveyed using the Activities-Specific Balance Scale (ABCS) prior to therapy and at the end of the 8-week course. The ABCS is a 16-item questionnaire aimed to assess the level of patient's difficulty in performing daily activities. A higher score indicates greater performance on activities of daily living.35 The ABCS was also administered by the instructing physical therapist to provide objective assessment of the participant’s progress.

Data Analysis

A total of 21 patients completed the study to date. Participants reported subjective improvements in their vestibular symptoms, reflected by a mean improvement in their ABC score by 8.26±10.26 (p<0.05). Mean DGI score also improved post Tai Chi intervention by 2.92 ±3.09 (p<0.05). Overall mean indices on ABC and DGI showed statistically significant improvement after undergoing Tai Chi rehabilitation. Of the 21 subjects, 9 patients deferred DGI evaluation due to personal reasons. There were no complications or adverse outcomes from Tai Chi therapy.

RESULTS

ABC Score Improvement

Pre and Post ABC score improvement. Higher score denotes greater improvement in daily activity and balance stability.

Vestibular Assessment

The Activities-Specific Balance Confidence Scale (ABC) and the Dynamic Gait Index (DGI) were used to evaluate the utility of Tai Chi as an effective form of vestibular rehabilitation. The ABC is a self-administered questionnaire aimed to assess the level of patient’s difficulty in performing daily activities. A higher score indicates greater performance on activities of daily living.35 The DGI is an objective measurement of gait, balance and fall risk. DGI measurements were performed by the two instructing therapists on a 30 foot walkway. ABC and DGI were collected before the beginning of the Tai Chi intervention and again at the conclusion of the 8 week program.

DISCUSSION

The average pre-therapy ABC score was 65.0±2.13 post-therapy. The average DGI score increased to 65±12.29. Mean indices on ABC and DGI showed statistically significant improvement after undergoing Tai Chi rehabilitation.

The various movements involved in Tai Chi may aid in retraining the brain to recognize and process signals from the vestibular, visual, and somatosensory systems, much like “conventional” vestibular rehabilitation. Our study demonstrates the utility of Tai Chi as an adjunctive form of vestibular rehabilitation. We observed subjective, objective and functional improvements in patients presenting with symptoms of both dizziness and vertigo. Although the exact mechanism of therapeutic effect is unclear, we theorize that overall improvement in cardiovascular function, gait and balance stability may be explained by the following factors: 1. Improved cardiovascular function enables us to investigate the efficacy of Tai Chi stratified by specific diagnosis such as vestibular neuronitis, and also by vestibular test results prior to onset of Tai Chi therapy. In addition, a randomized study comparing conventional vestibular rehabilitation versus Tai Chi would be beneficial in validating the use of Tai Chi as an effective form of vestibular rehabilitation rather than an adjunct form of therapy. This is also an area of our ongoing study.

CONCLUSIONS

Tai Chi may be beneficial as a form of vestibular rehabilitation in patients presenting with symptoms of both dizziness and vertigo. Although the exact mechanism of therapeutic effect is unclear, we theorize that overall improvement in cardiovascular function, gait, and balance stability may contribute to improved clinical symptoms (post-treatment).

REFERENCES

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DATA IMPACTIVE ANXIETY SCALE

ABC score improvement

Post DGI avg

Pre and Post DGI scores. Higher score indicates greater performance on objective assessment of gait and balance stability.

“Tai Chi on 1 Leg” (A. Frontal; B. Lateral view) This position is used to improve patients’ balance confidence.

“True stance”. (A. Frontal; B. Lateral view) This position is used to improve patients’ balance confidence.

CONTACT

Ana H. Kim, M.D.
Department of Otolaryngology-Head and Neck Surgery
New York Eye and Ear Infirmary
315 E. 14th Street, New York, NY 10012
Tel: (212) 617-8387 Email: hkim@nyee.edu

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ABSTRACT

Objective: The aim of this study was to evaluate the utility of Tai Chi in managing patients with vestibular problems who have failed conventional vestibular rehabilitation.

Study Design: Prospective survey.

Subjects and Methods: A total of 21 vestibular patients underwent an 8-week Tai Chi vestibular rehabilitation program. Participants were surveyed using the Activities-Specific Balance Scale (ABCS) prior to therapy and at the end of the 8 week course.

RESULTS

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Data Analysis: A total of 21 patients completed the study to date. Participants reported subjective improvements in their vestibular symptoms, reflected by a mean improvement in their ABC score by 8.26±10.26 (p<0.05). Mean DGI score also improved post Tai Chi intervention by 2.92 ±3.09 (p<0.05). Overall mean indices on ABC (N=21) and DGI (N=11) showed statistically significant improvement after undergoing Tai Chi rehabilitation. Of the 21 subjects, 9 patients deferred DGI evaluation due to personal reasons. There were no complications or adverse outcomes from Tai Chi therapy.

RESULTS

Conclusion: Our study suggests that Tai Chi may be useful as an adjunct form of vestibular rehabilitation. Patients in our study demonstrated improvement in their vestibular symptoms based on both subjective and objective assessments.

METHODS AND MATERIALS

Tai Chi vestibular rehabilitation was provided at our outpatient vestibular rehabilitation facility. Over 1000 patients annually undergo some form of vestibular therapy for a week or for a total of 8 consecutive weeks. Sessions were instructed by 2 licensed physical therapists in a Tai Chi class. Patients underwent a series of Tai Chi in the Yang family style. The overall aim of the program is to enhance balance and coordination while improving posture, breath control and motor control. This is accomplished through slow, smooth movements that require mindful attention to precise body alignment, focusing on the Tai Chi stance. The therapist chooses the appropriate stance depending on the patient’s current stability and balance.

Patient Demographics

A total of 21 patients completed the program, ranging in age from 43 to 81 years, with an average age of 69.7. 18 were women and 3 were men. Majority (n=17) had complaints of imbalance and dizziness with no definitive diagnosis. 4 patients reported frank vertigo. While some patients demonstrated caloric weakness on VNG and/or low gains on rotational chair prior to onset of Tai Chi therapy, some did not have diagnosable objective findings. 3 patients had no prior subjective or objective findings of imbalance prior to therapy. All patients deferred DGI evaluation due to personal reasons. There were no complications or adverse outcomes from Tai Chi therapy.

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The average pre-therapy ABC score was 65.0±2.13 post-therapy. The average DGI score increased to 65±12.29. Mean indices on ABC and DGI showed statistically significant improvement after undergoing Tai Chi rehabilitation.

The various movements involved in Tai Chi may aid in retraining the brain to recognize and process signals from the vestibular, visual, and somatosensory systems, much like “conventional” vestibular rehabilitation. Our study demonstrates the utility of Tai Chi as an adjunctive form of vestibular rehabilitation. We observed subjective, objective and functional improvements in patients presenting with symptoms of both dizziness and vertigo. Although the exact mechanism of therapeutic effect is unclear, we theorize that overall improvement in cardiovascular function, gait and balance stability may be explained by the following factors: 1. Improved cardiovascular function enables us to investigate the efficacy of Tai Chi stratified by specific diagnosis such as vestibular neuronitis, and also by vestibular test results prior to onset of Tai Chi therapy. In addition, a randomized study comparing conventional vestibular rehabilitation versus Tai Chi would be beneficial in validating the use of Tai Chi as an effective form of vestibular rehabilitation rather than an adjunct form of therapy. This is also an area of our ongoing study.

Conclusion: Our study suggests that Tai Chi may be useful as an adjunct form of vestibular rehabilitation. Patients in our study demonstrated improvement in their vestibular symptoms based on both subjective and objective assessments.