Scoliosis affects approximately 2% of the population. Electrical muscle stimulation, exercise programs, and manipulation have not been found to be effective treatments for correcting scoliosis. Scoliosis dramatically affects a patient’s self-image, their pain levels, and can result in secondary impairments, which if left untreated, can be severe.

The ATM2™ is a vertical treatment table, developed by a physical therapist with the intent to assist performing “Mulligan Techniques” (Mobility with Movement). Clinical evidence has been documented for the efficacy of the ATM2™ when used with patients (pts) who have LBP, hip problems, shoulder problems and cervical problems. The ATM2™ was found to be effective in helping to reverse the curves in a patient with scoliosis who was actually being treated for a frozen shoulder in a published case study (JMMPT 2009). The current study was undertaken to determine if the ATM2™ would be effective in treating scoliosis by reversing the curves of subjects with scoliosis who were recruited for the study.

Introduction

Scoliosis affects approximately 2% of the population. Electrical muscle stimulation, exercise programs, and manipulation have not been found to be effective treatments for correcting scoliosis. Scoliosis dramatically affects a patient’s self-image, their pain levels, and can result in secondary impairments, which if left untreated, can be severe.

Methods & Materials

Twenty-seven subjects (24 female, 3 male ages 12-75) with a diagnosis of scoliosis were accepted from a scoliosis support group, campus flyers and a yoga for scoliosis class. Inclusion criteria were as follows: subjects were between the ages of 12-75 with a diagnosis of scoliosis curve between 20° and 30°. Exclusion criteria were as follows: a previous surgery to correct the curve, current pregnancy, any serious medical co-morbidities, or any history of claustrophobia or anxiety possibly suffering from anxiety back pain that required medication. Subjects were put on the ATM2 and performed post- in second direction. Most subjects performed resisted extension (although flexion was used if there was no hypolysis and flexion was more limited than extension) and side-bending into their concavity. The subjects were progressed from 1 set of 10 repetitions to 3 sets of 10 repetitions in each direction. All subjects completed at least 1 round of treatments, which consisted of between 6-10 sessions. Some subjects who were available completed a second round of sessions for a total of 20 treatments. Objective measures utilized in this study included:

Nursing Pain Rating Scale
SF-36
Cobb angles from pre and post-intervention x-rays
Trunk ROM measurements including flexion (inclinometer), extension (inclinometer), side bending (measured fingertips to floor, with measuring tape), and rotation (measured with goniometer).

Results

Trunk extension and side-bending values were analyzed using a paired t-test. Several measures of ROM were improved. Side-bending was found to be significantly improved at p = .001 and both left and right rotation were significant at .0005. Using the Numeric Pain Rating Scale (0=worst pain, 10=best pain), change in pain was significant at p = .0102. The Minimal Clinical Significance for SF-36 is 2 points. The SF-36 is a self-report health survey that addresses 8 different areas affected by any given condition. Improvements were seen in role limitations due to physical and emotional problems, bodily pain, and general health perceptions. The Minimal Clinically Important Difference for the SF-36 is 5 points and the Minimal Detectable Change is 9 points.

Six subjects were able to obtain pre and post treatment x-rays. Decreases in angle of curvature were seen in all 6 subjects when determining Cobb angles. Statistics were not run because of a small n. In order to obtain statistical power, 30 subjects are required to see if the changes are minimally significant. Cobb angles improved or were unchanged for the 6 subjects. The Minimal Clinically Significant Difference for Cobb angles is ~7 degrees in adolescents (MCSD not available for adults).

Discussion and Conclusions

This study was done to determine if the ATM2™ can treat scoliosis by reversing spinal curvature. The hypothesis for efficacy is that by stabilizing a scoliotic curve, then moving into resistance, the apex of the curve would receive mobilization while the active movement from the subject would achieve neuromuscular re-education of the supporting musculature. X-rays taken before and after intervention showed decreases in Cobb angles for all six (set of 27) subjects who were able to provide post-treatment x-rays. Before and after photos also show changes in those who began with greater spinal curvatures. Some subjects reported they received comments about improved posture from family and friends. Subjects also reported improved self-image as a result of the study. Pain level and ROM values did not significantly change, even though subjects were not being treated for either of those complaints but rather their main concern was about their appearance. The ATM2™ was shown to be effective in reducing the spinal curves of Cobb-angles of subjects suffering to get pain, as well as observationally with pre and post intervention posture pictures. Based on the results of this study, treatment with the ATM2™ positively affects perceived level of health, self image and visible posture correction. Further study is currently ongoing involving additional subjects.