2006 Vol. 15 No 3

SCIENTIFIC

PHYSICAL THERAPY

Contrast Functional Results of Static Lumbar Stabilization Versus Dynamic Weight Bearing Exercise Including STEP Principles

By

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Study Design

The primary research design used in this study was a traditional two group experimental design with two repeated measures; each measure repeated at the conclusion of the treatment phase and one measure repeated one year following treatment.

Objectives

The purpose of the study was to determine the relative effectiveness of Scientific Therapeutic Exercise Progressions (STEP) and Static Lumbar Stabilization (SLS) in improving the functional activity levels, subjective reports of pain and number of contacts within the medical profession for the complaint of low back pain.

Background

Low back pain is one of the top ten reasons for primary care visits in the United States and accounts for one third of all disability costs. Several studies have attempted to compare intensive exercise to conventional physiotherapy without any or minimal differences noted in the effectiveness of the treatments in terms of pain relief or return to previous activity levels. Positive results gained during physical therapy for chronic low back pain do not seem to have a long term effect.

Methods and Measures

Of the 50 subjects initially included in the study, 31 subjects completed the study. Treatment consisted of manual therapy techniques for mobility and pain control. Subjects were randomly placed into one of two exercise groups, STEP or SLS. Average treatment in both groups was 10 sessions. The Modified Oswestry Low Back Pain Disability Questionnaire was given at the initiation of treatment, at the conclusion of treatment, and at one year following treatment. Information on number of contacts made in the medical profession was obtained through primary and specialist physician contact and a subjective questionnaire given to subjects to report follow-up with any medical professional for back pain including physicians, specialists, chiropractic treatment, naturopathy and physical therapy.

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Methods and Measures

Of the 50 subjects initially included in the study, 31 subjects completed the study. Treatment consisted of manual therapy techniques for mobility and pain control. Subjects were randomly placed into one of two exercise groups, STEP or SLS. Average treatment in both groups was 10 sessions. The Modified Oswestry Low Back Pain Disability Questionnaire was given at the initiation of treatment, at the conclusion of treatment, and at one year following treatment. Information on number of contacts made in the medical profession was obtained through primary and specialist physician contact and a subjective questionnaire given to subjects to report follow-up with any medical professional for back pain including physicians, specialists, chiropractic treatment, naturopathy and physical therapy.

Results

In each of the sections of the Modified Oswestry Low Back Pain Disability Questionnaire, subjects demonstrated no significant differences in ability to function immediately after physical therapy treatment or at one year follow-up. There was a difference in the number contacts made within the medical profession during the year following treatment. Those subjects that participated in SLS exceeded the number of visits made by subjects treated with STEP to a statistically significant extent. Critical value of Chi square at 0.05 and 1df=3.84.

Conclusion

This study demonstrated no significant difference in maintenance of improved function between the groups. STEP in combination with manual therapy utilized with individuals with chronic low back pain resulted in decreased utilization of the healthcare system as compared to subjects performing SLS.

Review of Literature

In terms of lumbar extensor strengthening, most studies [1, 2, 3, 4, 5] reported an increase in lumbar extensor strength and a gain of lumbar range of motion in the sagittal plane. However, this does not relate to a change in perceived functional ability. Pain reduction is an area of mixed results with several studies reporting a decrease in pain[1,3], and others reporting no change in pain level [8,10,12]. It appears for the treatment to be most effective in terms of decreasing pain it must be intensive in terms of difficulty and exercises repeated to the point of muscle fatigue.

General strengthening exercises have shown some positive improvement in low back pain and ability to work; however, there is more research supporting lumbar extensor strengthening [1,3,6]. There does not appear to be any correlation in the number of repetitions or type of exercises performed that result in a decrease in pain[1,7]. There has been no significant difference found between Medical Exercise Therapy and other types of active physical exercise[8,9].

The positive results of an exercise program during the intervention do not appear to have any long term affect on pain reduction, lumbar fatigue ability or ability to return to previous activity levels[6,9,10]. Little information in each study was given in discussion of home exercise programs in terms of frequency performed or whether they were given at all.

Methods

Purpose of the Study

The purpose of the study was to determine the relative effectiveness of Scientific Therapeutic Exercise Progressions and Static Lumbar Stabilization in improving functional activity levels, subjective reports of pain, and number of contacts within the medical profession for the complaint of low back pain. A one-year follow-up was conducted to note if the exercise programs were able to maintain the functional levels and decrease in symptoms noted at the discharge of physical therapy. A comparison was then made between the two programs to note if there was a correlation between the type of exercise program performed and maintenance of positive results.

Definition of Terms

Scientific Therapeutic Exercise Progression (S.T.E.P)

The goal of S.T.E.P., as described by the Ola Grimsby Institute residency course notes[11], is to increase tissue tolerance to activities of daily living by giving the optimal stimulus of repair to achieve optimal tissue tolerance. S.T.E.P. is an exercise plan individually tailored to the pathology and the tissue tolerance of the particular individual. It is divided into two phases. Phase one is the pain free phase which focuses on coordinated mobility and stability around physiological axes throughout the range of motion. The concern is relieving pain, reducing symptoms, and increasing circulation. The goals are to increase circulation to the tonic system, prevent atrophy, increase protein synthesis, and reduce the level of metabolites. As a general guideline, exercises begin with a low resistance and repetitions per set somewhere between 30 -150. In phase two, the primary goal becomes to restore and enhance function. It is important that the exercises be relevant to the function the patient needs for activities of daily living. Starting positions take into account the normal proprioceptive input, weight bearing, weight transfer, load characteristics, speed of motion, and

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ergonomics of the function undergoing training.

Static lumbar stabilization
Static lumbar stabilization includes isometric and concentric exercises for the trunk, upper extremity muscles and leg muscles with focus on maintaining a neutral pelvic position. The neutral pelvis being halfway between a full anterior pelvic tilt and full posterior pelvic tilt. Exercises are often performed in supine and standing as well as one quipment such as therapy balls with the focus of maintaining the neutral pelvic position. Stretching of musculature that attaches to the pelvis (hamstrings and hip flexors) is employed to assist with positioning into neutral. Similar definitions of isometric strengthening and passive stretching have been used by Manniche[12] in his own literature review of his research.

Chronic low back pain
" Chronic low back pain is defined as low back pain with or without leg pain greater than 12 weeks without neurologic signs requiring surgery, known spondylolisthesis, suspicion of malignancy, rheumatoid arthritis, pain in areas other than the lower back, or psychological dysfunction making it difficult to follow the treatment program." This definition was used by Torstensen, et al[8], in a single-blinded control study comparing the efficiency and costs of medical exercise therapy, conventional physiotherapy, and self-exercise in patients with chronic low back pain.

Functional activities
Functional activities include those activities that a person must perform on a daily basis. According to Physical Therapy[13], the definition of activities of daily living (ADL) is as follows. "ADL consists of those tasks that are recognizable as essential components of everyday life. They are tasks that the person must perform in order to function within the home and within society." This study used the Modified Oswestry Back Pain Disability Questionnaire to represent ADLs. These activities included personal care, lifting, walking, sitting, standing, sleeping, social life, travel, and employment/homemaking.

Research Design

The primary research design used in this study was a traditional two group experimental design with two repeated measures; each measure repeated at the conclusion of the treatment phase and one measure repeated one year following the treatment.

Subjects

Subjects selected for this study included clients with chronic low back pain of duration greater than twelve weeks with or without leg pain. Subjects in the Static Lumbar Stabilization exercise group had an average duration of low back pain of 5 years. Only 7 subjects in the Static Lumbar Stabilization exercise group complained of lower extremity symptoms with an average duration of 10.6 months. The subjects in the Scientific Therapeutic Exercise Progression group had an average duration of low back pain of 9 years. Thirteen subjects in this group complained of additional lower extremity pain on an average of 1.7 years.

All subjects were between the ages of 18 and 80 years of age who lived in southeast Arizona. Subjects included in the Static Lumbar Stabilization exercise group had an average age of 48.3 years, while the subjects in the Scientific Therapeutic Exercise Progression group had an average age of 55 years.

All subjects were referred to the researcher by physicians who had performed an initial diagnosis of low back pain. In order to be included in the study, all subjects participated in an initial evaluation by the researcher.

During the neurological assessment clients were excluded if they presented with a possible disc prolapse with neurologic signs and symptoms requiring surgery. These signs included loss of sensation, loss of motor strength, absent reflexes and loss of bowel and/or bladder control. The above exclusion criteria were intended to prohibit those individuals that fell outside the scope of physical therapy practice.

The researcher was also able to reproduce the patients symptoms during the examination through active range of motion, passive range of motion, resisted motion, palpation and other special tests which included: compression, distraction, shearing, segmental mobility testing, intervertebral foraminal gapping and closure, Cram's test, and specific sciatic nerve stretch tests.

The reproduction of the individual's symptoms through objective testing performed during the physical therapy examination suggested that the subject would benefit from conservative treatment approaches.

Participants were clients Arizona Family Care Associates Physical Therapy and had impaired function due to low back pain. Subjects in both groups were seen for an average of 10 visits in physical therapy. All subjects were discharged with a home exercise program to be performed during the year following treatment.

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Instruments

Modified Oswestry Low Back Pain Disability Questionnaire

The Modified Oswestry Low Back Pain Disability Questionnaire is a self administered paper and pencil subjective questionnaire that allows for a quantitative measurement of an individual's functional impairment. It includes ten sections with questions assessing limitations of daily living.

The ten areas are pain intensity, personal care, lifting, walking, sitting, standing, sleeping, social life, travel and employment/homemaking. Each section is scored 0-5 with 0 being the ability to perform the activity without pain and 5 being the inability to perform the activity. All sections are then doubled to find a percentage score [14,15,16,17].

Procedures

Subjects were randomly placed into the two exercise groups. Treatment in both groups included manual therapy for mobility and pain inhibition and instruction in body mechanics as related to the individual's activity level. Each subject was given a home exercise program to continue during the one year follow up.

Data Analysis

The Modified Oswestry Low Back Pain Disability Questionnaire generates data on functional outcomes at the ordinal level so a non-parametric statistic was the data analysis technique of choice for these hypotheses. Unfortunately, the range of scores for each of the questionnaire items is 0-5, creating a potential difficulty for selecting a data analysis technique that relies on analysis of ranked scores to determine the level of significance. The data analysis technique of choice in this phase of the study was a Chi-Square test of significance. This test took into account the changes in frequency of response category (i.e.,0 to 5) between pre-treatment and post-treatment data collected for each treatment group.

The number of contacts in the medical profession was determined by using NextGen medical documentation software. It allowed the researcher to search for medical visits for the reason of low back pain within the community of referring physicians. Using the history of appointments feature did not allow the researcher to access notes or any other information regarding visit. Only the diagnoses attached to the visit number could be accessed. If low back pain was a complaint/ diagnosis attached to the visit, it was considered a contact. Participants were also sent a questionnaire to report follow-up with any medical professional for back pain including physicians, specialists, chiropractic treatment, naturopathy and physical therapy. The Chi Square Test of Significance was used to determine whether differences in follow visits were statistically significant.

Results

In each of the sections of the Oswestry Low Back Pain Questionnaire, subjects in the Scientific Therapeutic Exercise Progression group and the Static Lumbar Stabilization exercise group demonstrated no significant differences in the ability to function immediately after physical therapy treatment and at the one year follow-up. Although the Chi Square calculation in each hypothesis indicated that there were differences in the amount of change between the two groups, the change was not sufficient to achieve statistical significance, so the null hypothesis was accepted: Scientific Therapeutic Exercise Progressions appear no more effective than Static Lumbar Stabilization Exercises in improving subjects' ability to perform personal care, lift, walk, sit, stand, perform work, perform recreational activities, or travel.

The study did demonstrate a difference in the number of contacts made with the referring physicians and specialists during the year following treatment. Those subjects that participated in Static Lumbar Stabilization exercises exceeded the number of visits made by subjects treated with Scientific Therapeutic Exercise Progressions to a statistically significant extent. The eighteen participants in the Scientific Therapeutic Exercise Progression group made 5 contacts in the medical profession for the complaint of low back pain in the year following treatment compared to 12 visits made by the thirteen subjects in the Static Lumbar Stabilization exercise group. (Chi Square Value = 4.27 Critical Value of Chi Square at 0.05 and 1 df = 3.84)

DISCUSSION

Low back pain is one of the top ten reasons for primary care visits in the United States and recurrence of low back pain occurs in 60-80 percent of individuals within two years. Low back pain accounts for one third of all disability costs in the United States and is the most expensive work related Disability[18]. Subjects in this study demonstrated less utilization of the healthcare system when instructed in Scientific Therapeutic Exercise Progressions in combination with manual therapy.

This study found that there was no significant difference in the improvement of functional activities when comparing two types of exercise techniques. This was consistent with the literature review.

In 1995 Laursen and Fugl[19] investigated the effect of individual physiotherapy on chronic low back pain. The

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aim of the individualized physiotherapy was to stabilize the hypermobile segments by strengthening appropriate muscles to achieve normal movement in fixed segments by specific manual techniques. At admission and discharge the patients filled out a form concerning back pain, leg pain, physical and psychological ability, the use of medicine, and socio-economical facts. One year later, the patients were asked by letter the above questions. Sixty-three of the 93 patients answered the letter at the one-year follow-up. The follow-up scores tended to return to the level of admission scores.

In 1998 Torstenen et al[8] compared outcome measures and costs for three different chronic low back pain interventions including medical exercise therapy, conventional physiotherapy, and self exercise. Outcome measures included pain, functional activities of daily living, and cost-benefit analysis. Pain in the back and leg were measured separately using 100 mm visual analog scales. Functional capacities on disability level were measured using The Oswestry Low Back Pain Disability Questionnaire. Results showed no significant difference between the two physiotherapy groups (medical exercise therapy and physiotherapy) in terms of pain, function and cost analysis.

In terms of lumbar extensor strengthening, most studies (Rische 1993[2], Nelson 1995[3],Chok 1999[4], Mannion 1999[20], Rissanen 1995[5]) reported an increase in lumbar extensor strength and a gain of lumbar range of motion in the sagittal plane. However, this does not relate to a change in perceived functional ability. Pain reduction is an area of mixed results with several studies reporting a decrease in pain (Nelson 1995[3], Manniche 1998[1]), and others reporting no change in pain level (Risch 1993[2], Chok 1999[4], Rissanen 1995[5]). The positive results of an exercise program during the intervention do not appear to have any long term affect on pain reduction, lumbar fatigue ability or ability to return to previous activity levels (Bendix 1997[6], Bendix 1998[10], Kankaanpaa 1999[9]).

Limitations

Limitations in this study included the use of the general diagnosis of chronic low back pain for inclusion in the study. The diagnosis is based on duration of subjective symptoms versus the pathology that caused the symptoms.

Although chronic low back pain was defined as low back pain greater than 12 weeks, individuals in this study averaged a history of low back pain over 9 years for the Scientific Therapeutic Exercise Progression group and 5 years for the Static Lumbar Stabilization exercise group. This study gave a large range for inclusion criteria in terms of age including subjects between the ages of 18 and 80. There was a 6.7 year difference for the average age of subjects in each group which may have influenced the results. The average age for the participants in the Static Lumbar Stabilization exercise group was 48.3 years and the average age for subjects in the Scientific Therapeutic Exercise Progressions group was 55 years. A study narrowing the parameters would give the researcher information to determine if age influences the benefit of either of the exercise approaches.

Compliance with home exercise prescription was not measured, although this could have had an impact on the maintenance of results at the one-year follow-up.

There was difficulty encountered with participant response to attempts to contact them in order to collect the one-year follow-up information. Of the fifty subjects originally in the study, only thirty-one completed the study. The final Scientific Therapeutic Exercise Progression group consisted of eighteen subjects and the final Static Lumbar Stabilization exercise group consisted of thirteen subjects.

Nine subjects did not complete the treatment program for a variety of reasons. Three had family emergencies requiring them to discontinue care. One subject transferred to another clinic closer to her home. One subject was noted to have cardiac complications at the initiation of exercise and was referred to cardiology with placement of a pacemaker. One subject was referred to neurology due to the worsening of symptoms. One subject required inpatient psychiatric care and two subjects did not complete the treatment program due to outside work requirements. Of those that did complete the treatment program, 10 did not complete the one-year follow-up questionnaire. Two subjects passed away during the year following treatment. One subject contracted a staph infection in a thoracic spine disc and one subject refused. Six subjects were unable to be located. The area in which the study was performed has a transient population due to the main local industry being dependent on a military base. This limited the ability to contact subjects over a year time frame.

Conclusion

This study suggests Scientific Therapeutic Exercise Progressions in combination with manual therapy utilized with individuals with chronic low back pain resulted in decreased utilization of the healthcare system as compared to subjects performing Static Lumbar Stabilization. This could potentially have a significant impact on cost to the healthcare system for the treatment of chronic low back pain.

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Acknowledgements

This research was performed in partial fulfillment of the Doctor of Physical Therapy degree through the Ola Grimsby Institute. The investigator would like to thank the committee members who generously contributed to this dissertation effort through their professional expertise and collegial support. These members include: Dr. Laurie Hartman, Dr. Didrick Sopler and Dr. Eddy Miller. In addition to the committee members, the investigator would like to thank the administrative staff and faculty of the Ola Grimsby Institute for their encouragement. I would like to extend my appreciation to Dr. Eddy Miller for his assistance with the statistical analysis.

References

1. Manniche C, Hesselsoe G, Bentzen L, Chritensen I, Lundberg E. Clinical trial of intensive muscle training for chronic low back pain. *Lancet*. 1998;2(8626-8627): 1473-1476.

2. Risch SV, Norvell NK, Pollock ML, Risch ED, Langer, Fulton, Graves JE, Leggett SH. Lumbar strengthening in chronic low back pain patients. *Spine*. 1993;18:232-238.

3. Nelson BW, O'Reilly E, Miller M, Hogan M, Wegner JA, Kelly C. The clinical effects of intensive exercise on chronic low back pain: A controlled study of 895 consecutive patients with one year follow up. *Orthopedics*. 1995;18(10):971-981.

4. Chok B, Lee R, Latimer J, Tan SB. Endurance training of trunk extensor muscles in people with subacute low back pain. *Phys Ther*. 1999;79(11):1032- 1042.

5. Rissanen A, Kalimo H, Alaranta H. Effect of intensive training on the isokinetic strength and structure of lumbar muscles in patients with chronic low back pain. *Spine.* 1995;20(3):333-340.

6. Bendix AF Bendix T, Oestenfeld S, Lund C, Kirkbak S. Comparison of three intensive programs for chromic back pain patients: A prospective, randomized, observer-blinded study with one- year follow-up. *Scand J Rehabil Med.* 1997;29(2):81-89.

7. Johannsen F, Remvig L, Kryger P, Beck P, Warming S, Lybeck K, Dreyer V, Larsen LH. Exercises for chronic low back pain: a clinical trial. *J Orthop Sports Phys Ther*. 1995;22(2):52-59.

8. Torstenen TA, Ljunggren AE, Meen HD, Odland, Mowinckel, Geijerstam. Efficiency and costs of medical exercise therapy, conventional physiotherapy, and self- exercise in patients with chronic low back pain. *Spine.* 1998;23: 2616-2624.

9. Kankaanpaa M, Taimela S, Airaksinen O, Hanninen O. The efficacy of active rehabilitation in chronic low back pain. Effect on pain intensity, self experienced disability, and lumbar fatigability. *Spine.* 1999;24(10):1034-1042.

10.Bendix AF, Bendix T, Labriola M, Boekgaard P. Functional restoration for chronic low back pain. Two-year follow-up of two randomized clinical trials. *Spine.* 1998;23(6):717-725.

11. Grimsby,O. MT-4b: Scientific Therapeutic Exercise Progressions. The Ola Grimsby Institute; 1998:9-123.

12. Manniche C. Clinical benefit of intensive dynamic exercises for low back pain. *Scand J Med Sci Sports*. 1996;2:82-87.

13. Scully RM, Barnes MR. *Physical Therapy.* Philadelphia: J.B. Lippincott; 1989:629-643

14. Fairbanks, Couper, Davies, O'Brien. The Oswestry Low Back Pain Questionnaire. *Physiotherapy. 1980;66(8):271-273.*

15.Tibbles, Waalen, Hains. Response set bias, internal consistency and construct validity of the Oswestry Low Back Pain Disability Questionnaire. *JCCA*. 1998;42(3):141-149.

16. Davidson M, Keating JL. A comparison of five low back pain questionnaires: reliability and responsiveness. *Physical Therapy.* 1882:5:512-515.

17. Fritz JM, Irrgang JJ. A comparison of a modified Oswestry Low Back Pian Disability Questinnaire and the Quebec Back Pain Disability Scale. *Physical Therapy.* 1981;2:776-788.

19. Larsen SO, Fugl IR. Outcome of treatment of chronic low back pain in inpatients. Effect of physiotherapy including intensive dynamic training inpatients with chronic low back trouble, evaluated by means of low back pain rating scale. *Dan Med Bull* 1995;42(3):290-293.

20. Mannion AF, Muntener M, Taimela S, Dvorak J. A randomized clinical trial of three active therapies for chronic low back pain. *Spine.* 1999;24(23):2435-2448.

Abstract

Scapulohumeral Reflex and Selected Demographic Factors: Their Relationships in a Normal Population

By
Katharine L. Gaj, DPT

Purpose
The purpose of this study was to determine the extent to which the scapulohumeral reflex occurs in the normal population, bilaterally or unilaterally, and is related to the demographic variables of age, gender, or hand dominance.

Methodology
A correlational research design was selected for use in this study. Measures utilized in data collection were the self-assessment questionnaire (for collection of demographic information and screening) and reflex testing.

Of the 100 subjects, one-third were males and two-thirds were females. They were included in the study because they were compatible with the criteria contained in the self-assessment questionnaire.

In order to determine whether data collected for hypothesis 1 were statistically significant, the Confidence Interval for a Single Population Proportion was computed. For the remaining hypotheses, the Chi Square test of significance was employed.

Findings
Statistically significant results were obtained for hypotheses 1 and 2, indicating that the scapulohumeral reflex is present in the normal population and is positively associated hand dominance.

Conclusions
The scapulohumeral reflex appears to significant degree in the normal population and should be tested more consistently in a neurological examination along with the biceps, brachioradialis, triceps, and Hoffman's reflex. An examiner can expect the scapulohumeral reflex to occur bilaterally, within older or younger age groups, male or female, and in left or right hand dominant subjects with the same expectations as other upper extremity reflexes.

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