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SCIENTIFIC

PHYSICAL THERAPY

Long term high intensity exercise and Rheumatoid arthritis

By

Didrik J. Sopler Ph.D., L.Ac.

High intensity exercise and rheumatoid arthritis are usually not what we think of as a good match. It may however be time to rethink that concept if we are to believe a recent study published in the journal Ann Rheum Dis.[1]

In this study the researchers investigated the effect of long term high intensity weight bearing exercises over 2 years on radiological damage of the joints of the hands and feet of 281 patients with rheumatoid arthritis.

This was a randomized controlled trial where the exercise group was compared with the Disease activity, use of drugs, change in physical capacity and bone mineral density and attendance rate at exercise sessions were all recorded.

The result were surprising because after 2 years the high intensity weight bearing exercise group, 136 participants, showed significantly less radiological joint damage than the 145 participants in the usual care group.

The exercise group had a mean increase in damage of 3.5 while the increase of damage in the usual care group was 5.7.

In this issue:

The investigation also found that the rate of damage was independently associated with less disease activity, less frequent use of Glucocorticoids and also with an improvement in aerobic fitness.

They also found that the difference in rate of increase of damage was more pronounced in the feet than in the hands.

Their conclusion was that these exercises may have a protective effect on the joints of the feet.

Even in a serious condition like rheumatoid arthritis it seems that too little stress on the joints are more of a problem than too much stress for many of these patients.

More and more research points out that in many conditions if is not overuse or too much stress to the tissue that is the problem, but rather the opposite, too little stress that is the problem.

Reference

1. de Jong Z, Munneke M, Zwinderman AH, Kroon HM, Ronday KH, Lems WF, Dijkmans BA, Breedveld FC, Vliet Vlieland TP, Hazes JM, Huizinga TW. Long term high intensity exercise and damage of small joints in rheumatoid arthritis. *Ann Rheum Dis. 2004 Nov;63(11):1399-405.*

Is Surgery the Best Solution for Patients with Subacromial Impingement?

By
Didrik J. Sopler Ph.D., L.Ac.

In a recent study conducted at a Danish hospital the researchers compared the effects of graded physical therapy training of the rotator cuff with arthroscopic subacromial decompression in patient with subacromial impingement.[1]

This was a randomized controlled trial with 43 patients in the exercise group and 41 in the surgery group. The duration of symptoms were between six months and three years.

All of the patients had a positive impingement sign including a set of other diagnostic criteria.

The follow up time was 12 months and the physical therapy included exercises to strengthen the stabilizers and decompressors of the shoulder.

Shoulder function was measured by the Constant score and a pain and dysfunction score. The baseline Constant score was 34.8 in the exercise group and 33.7 in the surgery group.

The improvements after twelve months was mean scores of 57.0 for the exercise group and 52.7 in the surgery group. There were no difference between the groups in pain and dysfunction scores.

The researchers concluded that surgery was not superior to physical therapy with training for rotator cuff syndrome with subacromial impingement.

The improvement in mean score was not significantly better between the exercise and the surgery group, but the exercise group still showed more improvement than the surgery group.

Reference

1. Haahr Jp, Ostergaard S, Dalsgaard J, Norup K, Frost P, Lausen S, Holm EA, Andersen JH. Exercises versus arthroscopic decompression in patients with subacromial impingement: a randomized, controlled study in 90 cases with a one year follow up. *Ann Rheum Dis. 2005 May;64(5):760-4.*

Abstract

Validity of the Manual Shear Test in Determining Degenerative Disc Disease in the Lumbar Spine

By
Mary Ann Paul, DPT

Purpose
The purpose of this study was to determine the degree of agreement between Magnetic Resonance Imaging findings and Anterior Lumbar Shear Test findings of degenerative disc disease.

Methodology
The research design employed in this study utilized a predictive format in which Shear Test findings were used to predict MRI findings.

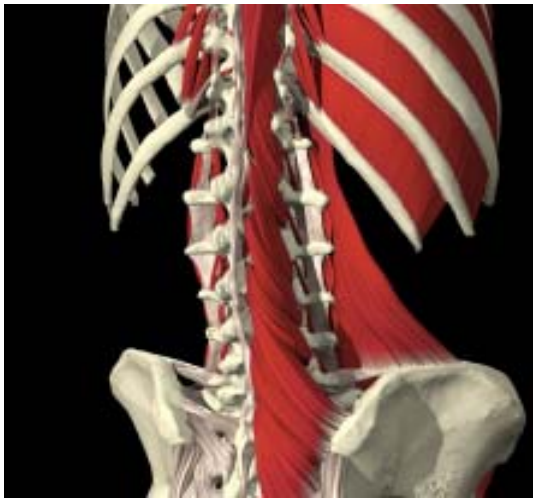
Subject selection utilized a 'blinded' approach in which prospective subjects were referred to the researcher with no information regarding their MRI findings. Prospects were included in the study if they did not violate any of the exclusion criteria.

The data analysis technique employed was the Chi Square statistic that compared the degree of agreement between shear test and MRI findings.

Findings
The results of the shear test agreed with the MRI results in 34 of the subjects where both measures were positive for degenerative disc disease, and agreed in four of the subjects where both measures were negative for degenerative disc disease.

Results of the shear test disagreed with the MRI results in nine of the subjects where the shear test was negative and the MRI was positive for degenerative disc disease, and in three of the subjects where the shear test results were positive for degenerative disc disease and the MRI results were negative.

The Chi Square analysis indicated that the degree of agreement between the shear test and MRI results was statistically significant.



Conclusions
The success of the current study is significant, because diagnosis of shear was based on manual palpation alone, thus, clinically, it can be a valuable tool when combined with subjective complaints and objective findings to provide the clinician with important information to guide the treatment of patients with low back pain.

Recommendations for further research include more therapists (inter-tester reliability), recruit a larger sample size, include flexion-extension radiographs, and obtain more detailed information on medical history and/or pain distribution.

Abstract

Interrater and Intrarater Reliability of Seven Selected Sacroiliace Joint Tests

By
Susan Pachter, DPT

Purpose
The purpose of this study was to determine the extent to which physical therapists agreed with each other (interrater reliability) and with themselves (intrarater reliability) when they employed selected tests in the evaluation of the sacroiliac joint dysfunction among patients with low back and/or buttock pain.

Methodology
Two research designs were employed in this study. In order to determine the extent of interrater reliability, a two rater correlational design with independent measures was utilized. In order to determine the extent of intrarater reliability, a one rater correlational design with repeated measures was utilized. Independent and repeated measures consisted of the standing and sitting pelvic test for palpation of the PSCSs and ASISs, forward bending test in standing and sitting, and the Gillet's test.

The 20 patients who participated in the study met the criterion of sacroiliac joint dysfunction and were compatible with the other inclusion and exclusion criteria. Physical therapists who participated in the study were the researcher and a professional colleague.

The data analysis technique utilized with each of the research designs was the kappa statistic, which produced a measure of chance. Degree of agreement was tested statistically and in relation to a classification system in which kappa statistics that were 80% or greater were considered favorable; between 79% and 40% were considered acceptable.

Findings
In two of the reliability tests the results were statistically significant. First, interrater reliability was demonstrated to a statistically significant extent on the sitting pelvic test for palpation of the ASIS. Second, interrater reliablity was demonstrated to a statistically extent on the Gillet's test. With the exception of two of the intrarater reliability comparisons, all the other reliability statistics were strong enough to be classified as 'acceptable', even though they did not achieve the degree of agreement needed to be considered statistical significant.

Conclusions
Literature sited by the researcher was not in agreement to begin with, although her findings tended to agree with those of previous researchers who found results that were either statistically significant or acceptable. Recommendations for further research focused on screening potential patients to insure they do have a true sacroiliac dysfunction, developing an assessment protocol that accurately specifies the approach to palpating bony landmarks, and studying the relationship between changes in soft tissue and the perception of changes in boney landmark symmetry.

Abstract

The Effectiveness of Concentric and Essentric Strengthening into Hyper Ranges of Ballerinas' Hip Joints, in Decreasing Hip Joint Popping and Pain

By

Amy R. Newburn, DPT

Purpose

The purpose of this study was to compare passive stretching and progressive concentric and eccentric strengthening in hyper ranges of the hip joint in dancers to determine which approach gave the most stability, coordination, and decreased pain.

Methodology

The research design employed in this study was a stratified experimental design with repeated measures. The repeated measures included resistance maximal, manual muscle testing, subjective reports of the subjects, Biodex Isokinetic testing, dance instructor evaluation of proper ballet technique, goniometric measurements, and subjective report on subjects' pain.

Subjects included in the study were teenage ballet dancers who met the criterion of hip popping with or without hip pain, and who were compatible with the other inclusion/exclusion criteria.

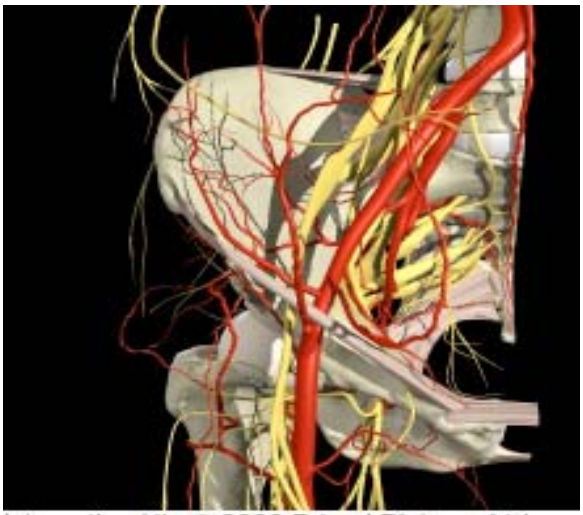
In order to determine if the stratification approach had actually created two groups of subjects that did not differ to a statistically significant extent, t-tests for independent groups were conducted on the pre-intervention data. In order to determine whether changes in pre-intervention and post-entervention data were statistically significant, a simple analysis of variance was computed.

Findings

Statistically significant differences that favored concentric and eccentric muscle testing were found between the two groups on the following variables: resistance maximal, hip popping, Biodex testing, and pain scores. No statistically significant differences were found for the other variables.

Conclusions

The findings in this study were generally in harmony with those reported by researchers whose studies were synopsized here. Recommendations for further research included replications with subjects of more diverse ages, replications focused on prevention rather than cure, and taking into account the possibility of the ceiling effect in manual muscle testing.



Interactive Hip © 2000 Primal Pictures Ltd.

Abstract

The Effectiveness of Scientific Therapeutic Exercise Progressions versus a Traditional Exercise Program when Combined with a Manual Therapy Treatment Approach for Frozen Shoulder

By

Cheryl K. Myers, DMT

Purpose

The purpose of this study was to determine whether selected manual therapy techniques with a traditional exercise program or those same techniques in combination with Scientific Therapeutic Exercise Progressions were more effective in restoring range of motion, improving functional status and decreasing pain levels in patients diagnosed with frozen shoulder.

Methodology

A two-group experimental design with repeated measures was the research design selected for use in this study. Repeated measures included the goniometer and the Shoulder Pain and Disability Index.

Subjects utilized in this study were referred to the research from a variety of sources who had been diagnosed with frozen shoulder and who were compatible with other inclusion/exclusion criteria.

A two-sample t test was employed to determine whether observed differences between the two groups on the repeated measures were statistically significant.

Findings

Changes in external rotation and flexion were statistically significant and greater for the group that received the manual therapy in combination with Scientific Therapeutic Exercise progressions. However, no statistically significant differences were found either for abduction, for functional change or for

Conclusions

The findings of this study were generally consistent with the literature cited by the researcher and recommendations for further researcher focused on replicating and extending this study to include larger sample sizes, stratification of subjects assigned to each group so the groups would be more closely comparable in terms of level of frozen shoulder disability, and comparing the manual therapy/ Scientific Therapeutic Exercise Progression protocol to other treatment approaches.

Abstract

Torque Characteristics of Three Types of Resistive Exercise

By

Michael J. McNeil, Jr., DPT

Purpose

The purpose of this study was to describe the torque characteristics of three common types of resistive exercise used in rehabilitation: pulleys, Thera-Band elastic tubing, and cuff weights.

In Order to accomplish the purpose of this study hypotheses were tested for each type of resistive exercise to detemine peak torque at 60 and 120 degrees per second, the angle of peak torque at 60 and 120 degrees per second, mid-range torque at 60 and 120 degrees per second, and average torque from 0 to 180 degrees. These hypotheses included tests of three, five, and seven pound cuff weights, red, green and blue tubing, and 1.5, 2.5, and 3.5 killegram pulley weights.

Methodology

The study utilized a descriptive research design in which data were collected in three trials for each of the hypotheses. Ten repetitions were performed for each trial at each speed. The set up for data collection with each of the resistive exercises was structured in such ways as to take into account insights gained from the review of the literature.

Data were collected using the Biodex isokinetic dynamometer, which was set to measure range of motion from 0 to 180 degrees. The dynamometer yielded torque data in foot-pounds and angle of peak torque data in degrees.

In order to analyze the data, the t-test for independent groups was employed.

Findings

Reguarding the analysis of the cuff weight data, statistically significant differences were found in torque at mid-range when comparing 60 to 120 degrees per second for the three and seven pound weights.

Reguarding the analysis of the tubing data, concentric torque was found to be significantly greater when comparing the two types of contraction at 60 degrees for all three colors of tubing.

Reguarding the analysis of the pulley data, statistically significant differences were found between contraction types and speeds, and for all weight categories at mid-range.

Conclusions

Because this study represented an initial attempt to describe the torque characteristics of each of the three resistive execises in similar, controlled circumstances, further research should be conducted in order to determine whether these same findings can be replicated. Once a baseline is established for the torque characteristics of each of these three resistance exercises, comparisons between them can be effectively researched.

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