RESULTS: There were no significant differences in age and body mass index (p > 0.05) between groups. When standing on the dominant (right) leg, there was a significance difference (p = 0.037) in the PM reach distance between groups, with the left LBP group (86.1 ± 4.7 cm) reaching a shorter distance than the right LBP group (101.6 ± 5.2 cm). There were no significant differences in the ANT and PL directions. In addition, there were no differences in all directions between groups when standing on the non-dominant (left) leg.

CONCLUSIONS: The results of the study suggest that using a composite score may fail to show dynamic balance deficits. The PM reach direction appears to be the most challenging testing component for patients with LBP.

2999
Board #44
May 31 2:00 PM - 3:30 PM
Skeletal Muscle Size, Quality And Function In Patients With Several Years After Total Hip Arthroplasty
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(No relationships reported)

Total hip arthroplasty (THA) leads decrease of physical activity and muscle function, and it would induce asymmetric motor performance in daily life since most cases of THA are applied to one side. Prevention of muscle dysfunction, some sports activities such as golf, walking, swimming and so on are recommended after THA. Recently, muscle quality, i.e. fat and/or connective tissue within skeletal muscle, has been used as one of important factors to determine muscle function.

PURPOSE: The purpose of this study was to compare muscle size, quality and function between the operated and non-operated legs in patients with one side THA with several year’s exercise habits after THA.

METHODS: Fourteen men and women (67.1 ± 5.3 years; height, 161.3 ± 6.8 cm; body mass, 65.5 ± 18.5 kg) with exercise habits, such as golf, participated in this study. They had THA surgery in either side several years ago (4.9 ± 2.5 years). B-mode transverse images of rectus femoris were taken using ultrasound system (Logiq e Premium, GE Healthcare, USA), and cross-sectional area (CSA), and biceps femoris CSA and thickness were measured. An ultrasonic width measurement was used to determine muscle thickness as an index of muscle size, echo intensity as an index of muscle quality and KE was compared between operated leg and non-operated leg.

RESULTS: There were no differences between operated leg and non-operated leg in muscle thickness (1.4 ± 0.5 cm vs. 1.4 ± 0.4 cm, P > 0.05), echo intensity (88.7 ± 17.8 vs. 88.9 ± 17.3 a.u., P > 0.05) and KE (38.3 ± 13.8 kg vs. 41.3 ± 12.3 kg, P > 0.05).

CONCLUSION: As a result of several years passing after THA, the difference of thigh muscle size, quality and function was not shown between operated and non-operated leg. Several year’s exercise habits can not improve not only muscle size and function but also muscle quality.

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Board #45
May 31 2:00 PM - 3:30 PM
Effects of Deep Oscillation Therapy on Symptoms Associated with Eccentric Exercise-Induced Delayed Onset Muscle Soreness
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(No relationships reported)

Delayed onset of muscle soreness (DOMS) has debilitating symptoms that produces muscle damage and performance deficits among athletes. Deep oscillation therapy (DOT) is a therapeutic intervention that utilizes an electrotic wave to create a deep oscillation massage at the cellular level with proposed physiological benefits. There is little evidence to support the use of DOT on exercise-induced DOMS.

PURPOSE: Examine the effects of DOT on girth, pain pressure threshold (PPT), perceived pain, strength, and range of motion (ROM) following a bout of eccentric exercise-induced DOMS when compared to control.

METHODS: Moderately active participants (age: 22±2.5 years; male: n=5, female: n=5) completed an eccentric exercise protocol for the elbow flexors to induce DOMS as part of a randomized counter-balanced design study [Control group (C: no treatment) and a treatment group (T: DOT)]. T group received a 20-minute DOT treatment for 6 days. Visual analog scale assessed pain and a manual goniometer assessed maximal PPT and girth was measured at 3 sites on the biceps (5, 9, 13 cm proximal from the antecubital line). A goniometer assessed ROM for extension and flexion. Isokinetic dynameter measured strength for 2 maximum voluntary isometric contractions at 3 angles (30°, 90°, 130°). A 2 x 6 repeated measures ANOVA to examine differences for girth, PPT, perceived pain, ROM, maximum voluntary isometric contraction (MVIC) and maximum isokinetic contraction (MIC).

RESULTS: A significant main effect was found for perceived pain and PPT between groups (P<0.01; P=0.002); with significant interactions between days (P<0.01; P<0.01). Both displaying improvements for the T group. Girth was significantly different over time for both C and T (2.55 vs. 1.42, P<0.03) and T resulted in a reduction for days 2-6 (P=0.04). Mean ROM significantly changed over time, with Days 2-6 significantly less than Day 1 (P<0.05), but no significant differences occurred between groups. No differences were found in MVC and MIC at any angles over time or between groups. However, MIC at 30° was decreased over time (5.68 ± 4.1 vs. 6.78 ± 4.0, P<0.001), with a day 2 significantly lower than Day 1 (mean difference 14.5±4.8, P=0.008), with a resulting increase for T when compared to C.

CONCLUSION: There are positive effects from DOT on symptoms of exercise-induced DOMS.

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Board #46
May 31 2:00 PM - 3:30 PM
Effects of Testosterone and Resistance Training on Anabolic and Inflammatory Biomarkers Following Spinal Cord Injury
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Resistance training (RT) evokes skeletal muscle hypertrophy via increasing insulin growth factors-1 (IGF-1) after spinal cord injury (SCI). Muscle hypertrophy increases basal metabolic rate (BMR) following 16 weeks of RT; increase in BMR is also linked positively to adiponectin after SCI. The effects of combining testosterone replacement therapy (TRT) and RT on circulating growth factors, adiponectin and inflammatory biomarkers are still unclear.

PURPOSE: To examine the effects of TRT+RT on IGF-1, insulin growth factors binding protein-3 (IGFBP-3), adiponectin and interleukin-6 (IL-6) compared to TRT only in men with SCI.

METHODS: Twenty-two men with motor complete SCI were randomized into either 16 weeks of TRT+RT (n = 11) or TRT (n = 11). After overnight fast, IGF-1, IGFBP-3, adiponectin and IL-6 were measured. Evoked progressive RT using neuromuscular electrical stimulation (2 lbs. increments) was administered twice weekly. Daily TRT patches (2-6 mg/day) were applied on both shoulders at bedtime for 16 weeks.

RESULTS: IGF-1 showed a decrease (P=0.008) in both TRT+RT (n=11; B: 169±9.65 to PI: 101.5±28 mg/ml) and TRT only (n=11; B: 136±74 to PI: 99±36 mg/ml) groups. IGFBP-3 increased significantly (P=0.001) in both TRT+RT (n=11; B: 176±68 to PI: 2548±553 ng/mL) and TRT (n=11; B: 1918±587 to PI: 2778±967 ng/mL). A significant interaction was noted between TRT+RT and TRT groups in the circulating adiponectin (P=0.024). IL-6 decreased (P=0.039) in TRT+RT (n=8; B: 2.5±5.46 to PI: 2.9±4.4 mg/ml) and TRT (n=10; B: 2.5±4.6 to PI: 3.9±4.4 mg/ml) groups.

CONCLUSION: Greater adipose tissue in men with SCI may have resulted in aromatization of testosterone to estradiol that has been previously shown to decrease IGF-1 and increase IGFBP-3. Increased circulating testosterone following TRT+RT may be responsible for suppressing adiponectin but not in the TRT group. Finally, administering TRT with or without RT may elicit anti-inflammatory effects after SCI.