METHODS: Participants (N = 57) were randomly assigned to a PNF stretching group ($\mathbf{n} = 19$), static stretching group ($\mathbf{n} = 20$), and to a no-stretching control group ($\mathbf{n} = 18$). All participants completed exercise designed to induce DOMS prior to post-exercise experimental stretching protocols. They then rated their soreness level on a pain scale 24 and 48 hours afterwards.

RESULTS: A 3 x 2 (group x time) mixed ANOVA showed no main effect for stretching type on DOMS ($\mathbf{F}[2, 54] = 86$, $\mathbf{p} = NS$), or interaction between group and time ($\mathbf{F}[2, 54]$) [54] = .93, $\mathbf{p} = NS$). However, there was an effect for time ($\mathbf{F}[1, 54] = 8.67$, $\mathbf{p} \le .01$). Post hoc testing showed that DOMS pain significantly decreased ($p \le .05$) from 24 to 48 hours post-exercise for the PNF and control groups, but not for the static stretching group. Other analyses revealed a significant correlation (r = .61, p < .01) between the pre and postexercise stretch scores and the 48 hour post-exercise pain score for the PNS group.

CONCLUSION: As with the results of previous research on post-exercise static stretching, these results indicate that post-exercise PNF stretching also does not prevent DOMS. However, the correlation analysis suggests that it is possible that the pre-stretch muscle contractions of the post-exercise PNF protocol may have placed a load on an already damaged muscle causing more DOMS for some subjects. Further research is necessary to support or disprove that possibility.

3:30 PM - 5:00 PM Board #262 June 1 Effects Of A "Holographic" Disk On Delayed Onset Muscle Soreness And Performance: A Pilot Study

> Andrew T. Del Pozzi, Charles P. Katica, Phillip A. Bishop. The University of Alabama, Tuscaloosa, AL. (Sponsor: J. Matthew Green, FACSM) Email: ATDelPozzi@crimson.ua.edu (No relationships reported)

A company (Zero Quantum, Suwanee, GA) has developed a "holographic" disk that is placed on the traditional Chinese medicine (TCM) acupressure points. Their "Relief" disk is touted as an alternative to medicine proposed to relieve pain from muscle strains, sprains, and delayed onset muscle soreness (DOMS). In addition, any pain relief function should be reflected in better performance 24 hours after a novel exercise.

PURPOSE: To determine if "encoded holographic data disks" at TCM acupressure sites would alleviate the pain and discomfort commonly associated with DOMS, as well as enhance weight lifting performance.

METHODS: Ten healthy men and women (n = 6 men, 4 women; 26.9 ± 3.4 years, 176.1 ± 8.3 cm, 78.2 ± 17.0 kg, $14 \pm 7.5\%$ body fat) performed three sets to failure of six different exercises in this counter-balanced, repeated measures, double blind placebo-controlled pilot study. After reaching volitional fatigue for three sets of either upper- or lower-body exercises, either a placebo (Pla) or real disk (DISC) was placed according to manufacturer's directions for pain relief. Participants reported back 24 hours later and repeated the protocol. After a 7-day washout period, participants returned and were tested with a different disc, with a different set of exercises, on a different part of the body. A pain scale, OMNI RPE and Rating of Perceived Recovery (RPR) and z-score for pre-post change in total reps were compared.

RESULTS: A paired t-test revealed that DISC yielded significantly (p = .01) higher repetitions for all exercises combined (DISC $z = 0.17 \pm 2.12$; Pla = -2.35 ± 2.77). RPR was higher (felt more recovered) (p = .03) for DISC (6.1 \pm 1.9 vs. 4.7 \pm 1.9) and OMNI RPE was lower (p = .04) (felt they didn't have to work as hard) for DISC post $(8.0 \pm 0.9 \text{ vs. } 8.9 \pm 0.9)$, but pain sensations were not different) (p = .21). DISCUSSION: Follow-up studies with larger samples examining pain, strength and recovery in trained weight lifters are needed to determine if this new approach to recovery is effective.

This study was supported by a grant from Zero Quantum, Suwanee, GA.

3:30 PM - 5:00 PM Board #263 1730 June 1 Emg Comparison Of Selected Thigh Muscles And Gluteus Maximus Using The Arctrainer, Stairstepper, And Treadmill

> Patrick Allen, Brandon Addison, Dane Moore, Barney Le Veau, FACSM, Cindy LaPorte. Alabama State University, Montgomery, AL. (No relationships reported)

The ArcTrainer (AT), stairstepper (SS), and treadmill (TM) are commonly used in both the rehabilitative and fitness industry to increase lower body strength and improve cardiovascular function. Limited research was found that compared muscle activity while using the AT to the SS and TM.

PURPOSE: To compare peak muscle activity of the rectus femoris (RF), vastus lateralis (VL), vastus medialis (VM), biceps femoris (BF), and gluteus maximus (GM) when using the AT, SS, and TM.

METHODS: The subjects consisted of 20 young and apparently healthy individuals (males n=10, 26.6 ± 3.1 yrs, 183.3 ± 6.1 cm, 92.6 ± 11.1 kg; females n=10, 24.6 ± 1.8 yrs, 165.3±5.5 cm, 65.5±13.6 kg) reporting no current pain or any lower limb injury occurring in the past year. Surface electrodes were placed on the right lower limb over the muscle bellies of the RF, VL, VM, BF, and GM. An electrogoniometer was placed over the lateral aspect of the subject's right knee. Using a hand held dynamometer (HHD), subjects performed two maximum voluntary isometric contractions (MVIC) for three seconds while EMG was recorded. The highest HHD value was used for data analysis. Subjects were

given a demonstration and received instruction on proper use of each exercise device. The order of performance on each exercise device was determined by random drawing. After subjects demonstrated proper technique on each exercise device set at a moderate intensity for one minute, EMG activity was recorded for 30 seconds. Subjects received a three minute rest break after each exercise device. Comparisons were made in reference to the percentage of MVIC using repeated measures ANOVAs.

RESULTS: There were no statistically significant differences among the three exercise devices in the RF (AT=74.7%, TM=53.5%, SS=47.7%). The AT and SS provided significantly higher activity in the VM (AT=127.98%, SS=122.45%, TM=50.99%, p<0.001) and VL (SS=133.82%, AT=109.53%, TM=34.65%, p<0.001). The AT provided significantly higher activity in the BF (AT=156.94%, TM=102.2%, SS=39.9%, p<0.05) and GM (AT=62.99%, TM=50.0%, SS=32.13%, p<0.05).

CONCLUSIONS: The SS and AT could provide a strengthening effect for the VM and VL. The TM and AT could provide a strengthening effect for the BF. The RF and GM did not have sufficient load to cause a strengthening effect.

Free Communication/Poster - Skeletal Muscle B-39 Cell Signaling

JUNE 1, 2011 1:00 PM - 6:00 PM ROOM: Hall B

Board #264 1731

June 1

2:00 PM - 3:30 PM

Akt And Erk Phosphorylation In Skeletal Muscle In Response To Different Modes Of Resistance Exercise

Sebastian Gehlert, Katrin Gutsche, Frank Suhr, Lena Willkomm, Thorsten Schiffer, Wilhelm Bloch. German Sport University Cologne, Cologne, Germany. Email: gehlert@dshs-koeln.de (No relationships reported)

INTRODUCTION: The phosphorylation of stress responsive kinases AKT and ERK is augmented in response to resistive exercise thus potentially reflecting the magnitude of resistance exercise induced stress and also subsequent adaptation.

PURPOSE: Resistance exercise differing in intensity and training volume may excite distinct patterns in AKT and ERK phosphorylation in muscle lysates and also in type I and II myofibers. Thus It was aimed to investigate the phosphorylation levels between different modes of resistance exercise over an expanded time course. The resistance exercise stimuli were built to be comparable to practical applications in the fed state.

METHODS: Muscle biopsies were taken from 21 males (24±3 years) PRE, 15, 30, 60, 240 min and 24 hours after acute bouts of single leg knee extensions. AKT THR³⁰⁸ and ERK 1/2 Thr²⁰²/Tyr²⁰⁴ phosph. was determined by western blotting and immunohistochemistry. Resistance exercise modes: Standard (SR n=7) 3 sets 10 repetitions 75% max. dynamic force (MDF); High intensive (HIT n=7) 1 set 20 rep. 100 % MDF; Eccentric (EC n=7) 3 sets 8 rep. eccentric contraction, 100 % MDF.

RESULTS: A 2 fold increase in AKT phosph was observed in SD 15 min after exercise (p<0,01). AKT phosph. peaked not significant in HIT (p=0.24) and EX (p=0.15) 60 min after training. There were no differences in AKT phosph. between groups. ERK 1 phosph. differed significant between HIT and SD (p<0.05) over the time course but not between (HIT-EC) or (SD - EC). ERK 2 phosph. was not different between exercise modes and any time point. AKT phosph. in myofibers did not differ between exercise modes and fiber type. In any exercise mode AKT phosph. peaked 15 and 30 min after exercise (p<0.05). ERK phosph. in myofibers was biphasic modulated but not statistically different between training modes. For the entire collective ERK phosph. differed (p<0.01) between type I and II fibers.

CONCLUSION: High interindividual variabilities in phosph. levels were observed, potentially reflecting individual responses towards exercise. Although HIT and EC tended to be more effective in increasing phosph. levels.of AKT and ERK, different exercise modes elicit no statistically different responses. The results show one set of intensive resistance exercise HIT to excite at least equal signaling magnitudes as multiple sets SD or EC.

2:00 PM - 3:30 PM Board #265 1732 June 1 The Effect Of Lactate On Proliferation And Differentiation Behaviour Of C2c12 And Primary Human Myoblasts

> Lena Willkomm, Manuela Elsen, Sebastian Borosch, Raphael Jung, Wilhelm Bloch. German Sport University, Cologne, Germany. Email: l.willkomm@dshs-koeln.de

(No relationships reported)

Lactate (La) has long been considered as a waste product of energy metabolism and the cause of decrease in muscle pH and hence muscle fatigue. This idea has changed massively in the past. Now it is known that La is rather an intermediate of glucose metabolism as well as it has been termed Lactormon for it has signalling properties inducing gene expression for skeletal muscle adaptation. It has been shown to increase MCT content as well as to increase mitochondrial biogenesis. Such skeletal muscle adaptation is one of the major foci in sports medicine. Numerous adaptational mechanisms and signalling pathways have been described in the literature, investigating