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ABSTRACTS

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A.8. SPORTS IN REHABILITATION AND SPORTS REHABILITATION

PA895

Age and Gender Differences in Weights Lifted in a Gravitational Wellness Gym

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In a previous study, we reported on a new weightlifting technique which allowed individuals to lift extremely high weights, with significant progression through weekly 30 min. sessions. In a follow up study, we found significant improvement in musculoskeletal complaints, with an extremely low rate of injury. This study expands was designed to better understand the differences in the effects of this weightlifting system by age and gender. This retrospective study included the records of individuals participating in a gravitational wellness center in Atlanta Georgia. A weightlifting program included free weights in four separate stations including a belt lift, hand lift, chest lift and leg lift. The belt lift involved the patented belt system, allowing for free weights to be lifted with the belt placed over the individuals pelvis. In all stations, the subjects were asked to with until the form of their weightlifting was judged to be faltering. Patients returned for 20 min. sessions every week for the first 10 weeks. 161 individuals including 100 males and 61 females completed at least 10 sessions. The participants ranged in age from 17 to 74 years. Despite the short weekly sessions, significant weekly gains were found for both genders and in all age groups ($p < 0.001$). At the 10th session, the mean weight lifted at the belt lifting station was 949 pounds for females and 1,336.7 pounds for males. For the hand lift the average weight lifted at the 10th session was 321 pounds for females and 525.7 pounds for males. For the chest press these values were 235.4 pounds for females in 418.2 pounds for males. For the leg press, these values were 750 pounds for females and 1,006.5 pounds for males. For both males and females, the 31 to 40 year age group consistently lifted heavier weights than the other age groups.

PA896

Age and Gender Differences with Gravitational Free Weightlifting

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A growing number of strength and power training studies have demonstrated that weight lifting can deliver significant health benefits. When using strength and power lifting programs, studies have shown that individuals you into their 70 s and 80 s can be expected to see improvements in strength, power mobility and agility in as little as 10 weeks. This study reviewed the effects of a once weekly extreme weightlifting technique, the Gravitational Wellness technique for improving strength. 161 participants included 100 males and 61 females enrolled in a gravitational, wellness gymnasium. At this facility, participants were asked to lift free weights, using four separate weight stations including a belt lift, a hand lift, a chest press, and a leg press. The initial belt lift exercise involved in a patented belt system that allowed lifting with the legs, without holding a barbell. Participants lifted progressively larger weights until the instructor determines that their form was faltering, and then reduced the weight by 30% for additional repetitions. Time at each station was 10 min. The average weight lifted for females and males at the initial lift was 462.5 pounds and 654.3 pounds respectively in week one, increasing to 149.4 and 1,336.7 pounds at week 10. For the hand lift, in the first week, females lifted an average of 184.1 pounds while males lifted an average of 297.2 pounds, increasing to an average of 297.2 and

525.7 pounds respectively. The chest press, the and waits for the females were 235.4 pounds and for the men were 418.2 pounds. Finally, for the leg press, at week 10, a women lifted 758.0 pounds in the men 1,006.5 pounds. Significant differences were noted in week two week gains for both males and females ($p < 0.001$). *Conclusion:* this study demonstrates that heavy weightlifting for 30 min. per week could produce significant and dramatic weights lifted over a 10 week training period

PA897

Heart Dimensions in Elite Sci Paralympians Competing in Throwing and Swimming

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Introduction/Background: Athletics include running, jumping and throwing events. The later are considered to be more anaerobic events. On the other hand in swimming, athlete makes more aerobic effort. The aim of this study is to investigate the myocardial adaptation in these two paralympic sports (throwings and swimming) of elite, wheelchair bound, athletes with spinal cord injury. *Materials and Methods:* Forty-seven athletes took part in this study. They were competing in 2 paralympic sports, sitting throwing (Group A, n=34) and swimming (Group B, n=13). They had undergone a thorough cardiologic examination included ECG and Heart ultrasound. The purpose of the examination was to obtain Athlete's License that was a rule of The Panhellenic Sports Federation for People with Disabilities. All these athletes are considered to have a normal examination. The purpose of this examination was to exclude athletes with heart disease. Statistical analysis were performed with *t*-test *Results:* Field athletes had duration of disability 21.6±19.3 years, mean age 41.1±10.6 years, years competing in sports 10.4±5.4. Heart ultrasound showed aortic root 31.1±4.2 mm, Left sinus 33.4±4.2 mm, Ventricular Septum Wall 9.6±1.2 mm, Left Ventricular Posterior Wall 9.2±1.1 mm, Left Ventricular Diastolic Cavity 47.2±8.3 mm, Left Ventricular Systolic Cavity 31.9±4.9 mm, and Ejection Fracture 66.9±5.6%. Compared with throwers, swimmers had duration of disability 26.4±15 years ($p=0.2$), mean age 36.3±9.4 years ($p=0.1$), years competing in sports 8±4.1 ($p=0.1$). Heart ultrasound showed aortic root 31±3 mm ($p=0.9$), Left sinus 33.6±2.6 mm ($p=0.8$), Ventricular Septum Wall 9.6±1.1 mm ($p=0.9$), Left Ventricular Posterior Wall 9.6±1.2 mm ($p=0.4$), Left Ventricular Diastolic Cavity 49.2±3.8 mm ($p=0.3$), Left Ventricular Systolic Cavity 30.1±4.1 mm ($p=0.2$), and Ejection Fracture 68±4.5% ($p=0.3$). *Conclusion:* Heart dimensions of spinal cord injured athletes competing in swimmers are not different of those competing in throwing events.

PA898

The Effect of a Decrease Plantar Loading Tape on a Height of Medial Longitudinal Arch in Amateur Basketball Players

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Introduction/Background: Repetitive jumping and running promote a decline in a height of the medial longitudinal arch (MLA) or an excessive foot pronation which is known as one of the risk factors for foot and ankle injury. A decrease plantar loading tape (DP) could maintain the height of the MLA after jogging. However, the evidence is limited in basketball players. The aim of the present study was to investigate the effect of the DP on changes in the height of MLA after basketball game. *Materials and Methods:* A crossover design was performed in thirty male amateur basketball players aged between 18-25 years. At baseline and post-

INTRODUCTION

While aerobic exercise is largely accepted as a means of delivering health benefits, studies have shown that strength training can deliver significant health benefits as well. These include improvements in strength, function, pain, speed of walking, and overall quality of life.¹⁻² Recent studies of the Gravitational Wellness System (GWS), have shown this weight lifting technique to have the capacity to load the musculoskeletal system with uniquely high weights, leading to rapid weekly strength gains using only short weekly training sessions.³ This technique, developed by a Russian physiologist, includes a simple but unique equipment, that allows participants to lift high weights of over short arcs (Figure 1). This device has received patents in both the United States and in Russia.

MATERIALS & METHODS

A review of gym performance records was completed of consecutive individuals who completed the recommended 10 week GWS program over a three year period. Data were retrieved concerning age, gender and weights lifted at each weekly exercise session.

PROCEDURE

At each exercise session, the participant engaged in four separate exercises, all involving free weights using a barbell system. The belt lift involved a belt, resting on the pelvis. The participant, beginning with hips and knees flexed at approximately 45°, extends the hips and knees while holding a rail stabilizer. Weights are progressed until the instructor detects that the form of the lift is faltering. At this point the weights are reduced by 30%, and the participant is asked to perform three more lifts. The process involves approximately 10 total lifts. A similar progression of weight is achieved in each of the other stations including the hand lift, chest lift and leg lift. In the hand lift, the participant uses specialized gloves to assist with gripping of the bar. The participant flexes the knees to approximately 45° while protracting the shoulders. The progression of weight proceeds as did the belt lift, with approximately 10 total lifts. The chest lift, similar to a bench press, begins with the elbows at 45° and moving to near full extension. The leg lift involves a similar extension maneuver with running shoes placed directly against the bar. The maximum weight at each station was recorded, with participants returning every week for an additional 30 minute session. Data were reviewed for weights gained per session, and reviewed by age and by gender.

FIGURE 1: BARBELL SYSTEM

A: BELT LIFT



B: HAND LIFT



C: CHEST LIFT



D: LEG LIFT



RESULTS

Records of one hundred and sixty-one participants were reviewed, including 100 males and 61 females. All were in the program for at least 10 weeks. The subjects ranged in age from 17 to 74 years of age.

Data for the belt lift revealed and mean initial/final (week 10) weight of 462.5/949.4 pounds for women and 654.3/1336.7 pounds for the men. For the hand lift, the mean initial/final weight achieved by the females was 184.1/321.1 pounds and 297.2/525.7 pounds for the men. For the chest press females achieved a peak weight of 164.1/235.4 pounds and the males' 281.1/418.2 pounds. For the leg press, the mean initial/final weight for females was 461/758 pounds and for males was 606.8/1006.5 pounds. At each station, weekly gains in strength was significant for all ages and both genders ($p < 0.001$). No interruptions in weight lifting were noted as a result of injury.

DISCUSSION

In this retrospective study, training records of 161 consecutive participants were review, who completed 10 weekly 30-minute GWS training sessions. We found that despite high average starting weights, participants could, on average, double their weight lifting capacity within 10 sessions, with those weights lifted exceeding weights reported in other weightlifting regimens. This represents a total of approximated five hours of total exercise. Interestingly, significant weight progression was achieved in weight group and for each gender, even among those over the age of 60.

CONCLUSION

This study of consecutive participants at a Gravitational Wellness gym found that participants, lifting large weights over short arcs, 30 minutes once per week, could significantly increase their strength, at each session, with an average weight lifted peaking at over 1,000 pounds by week 10. Significant gains were made by both sexes and in all age groups.

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