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Velocity in the Ankle of an Elderly Patient

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Abstract

Strength training has been suggested as a more effective type of resistance training for older adults to function. It is not yet known whether older adults respond appropriately to strength training versus strength training guidelines. The purpose of this study was to determine speed during strength and strength training, with elastic resistance bands, in older adults participating in a geriatric rehabilitation day program. It has been hypothesized that strength training will be faster than strength training, but there will be large individual differences. Nine patients aged 70 to 86 years performed strength training and strength training of the dorsal and plantar flexors using elastic resistance bands. Training sessions are filmed to assess training speed. Strength training happens at a faster pace than strength training for both muscle groups. However, a large difference was observed between the participants in terms of training speed. Older adults undergoing geriatric rehabilitation are likely to develop contractions more quickly during strength training than during strength training. However, the actual speed achieved varies between individuals. This may explain some of the mixed findings in strength training studies. Therefore, researchers should monitor speed when comparing different types of resistance training.

Keywords: Plantar flexors; Resistance training; Post-comparisons

Introduction

Several changes occur in the neuromuscular system with aging leading to weakness and loss of strength. Resistance training is advocated as a way to improve the situation. Most of the early research on resistance training for older adults focused on strength training, in which heavy objects are moved at a relatively slow rate. These studies have shown that older people can experience muscle hypertrophy and also increase in strength. However, it has been questioned whether improvements in strength translate into functional benefits, as most functional quests require more strength than strength. As a outcome, many researchers have begun to explore the benefits of strength training over strength training to improve strength, power, and function. The outcomes of many studies have been mixed, with only a slight overall benefit of strength training over strength training in improving function, and outcomes have been inconsistent [1-4]. One reason for the lack of difference between strength training and strength training could be because the training speed may not be too different or different enough between the groups. Only a few of the many studies on strength versus strength training have actually measured or tracked training rate or power output, and this is often done on strength training equipment. very sophisticated resistance movement is limited. Along with equipment commonly used for strength training in the elderly, such as weight machines, free weights, weight vests, etc. The researchers, out of dozens of studies that have been done, rely on older adults exercising at a brisk pace, without knowing if they're actually doing so. Most researchers have used different verbal instructions for the "as fast as possible" phase of concentric motion for strength training and "slow and controlled" for strength training. It dominates the field so much that it uses "movement speed 'as fast as possible'" as the selection criterion for strength training studies in the literature in their meta-analysis of training comparisons and strength [5-7].

In a previous study of strength training using resistance bands and weight machines in older women with limited mobility, it was observed that although individuals were The strength training instructors are the same, but they perform very different muscle contractions. Therefore, a pilot study was conducted with two participants from the published study who performed ankle strength training exercises using elastic resistance bands. They were videotaped and their average training speed analyzed using motion analysis software. While one participant trained at 20 and 37 degrees a second during the back and foot flexion training, the other participant trained at 37 degrees a second and 80 degrees a second [8]. So even though they gave the same instructions to the participants, they trained at different speeds. Although exercise performance was randomly observed at various speeds for all participants, this study, like many previous studies, did not include a measure of training speed. training for all participants.

Materials and Methods

In this study, all older participants enrolled performed both strength and power training of the ankle dorsiflexors (DF) and plantar flexors (PF). As the specific purpose was to examine the velocities during training, there were both within and between participant comparisons made. No pre- versus post-comparisons were done because the study was not designed to examine the outcomes of the training program, but rather how the participants trained. Patients 65 years and older attending a day hospital geriatric rehabilitation program were eligible to participate in the study if they were: cognitively intact (e.g., could follow instructions for strength and power training as assessed by program staff based on their clinical judgment and patient files where cognition was recorded if there were concerns and it was measured), were able to participate in exercise (e.g., did not have any unstable heart conditions), and particularly were able to do ankle exercises, had not participated in any strength or power training of the PF and DF muscles in the past 6 months, did not have a systemic neural condition that majorly affected movement control (e.g., Parkinson's disease or multiple sclerosis), and would be attending the day hospital program long enough for them to complete the training sessions [9]. All patients were first approached

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by staff at the geriatric rehabilitation program based on them generally meeting the eligibility criteria. Next, the authors met with those who were interested in hearing more about the study to (1) explain the study in a detailed way; (2) determine whether they were still interested in participating; and (3) determine whether they met all the inclusion/exclusion criteria. Thirteen participants were informed about the study by program staff and met with the researchers. One potential participant was excluded from the sample due to possible cognitive problems that prevented her from giving informed consent. Of the remaining 12 potential participants, one suffered acute leg swelling and was therefore unable to attend, another was unable to arrange transportation to attend the show, and the last one was unable to participate. This caused nine participants to complete the study [10].

Velocity

Only one side is rotated for each participant. Participants were filmed using a Canon 200MC Optura mini DV digital camcorder, Tokyo, Japan, which had a sampling rate of 30 fps. It is placed about 2 meters from the shooting foot, to record the movement of the ankle vertically. The camera was fixed on a tripod. To identify the hip, knee, and lateral edge of the foot, markers were used. Markers were taped to the participants' pants and shoes at the hips, ankles, and toes. An elastic band was used to mark the knee. The positions of the markers were measured relative to the skeletal landmarks, and the markers were placed in the same position each time the participant exercised. The specific reliability of the speed measurements in this study was evaluated in a subsample of data. Measurements of interest were taken using multiple copies of four participants, then these measurements were taken again after a one-week period. It is important to note that the process of making measurements is semi-automatic for the operator to define the marker, but the actual angular velocity is determined by the software as the software "tracks" the marker. Through their orbits. Mean and maximum speed measurements were found to be reliable (coefficients of variation ranged from 3.6% to 8.9% for DF variables and from 3.9% to 11.5%. for PF for variables d).). Statistical analysis was performed using SigmaPlot. To examine the changes in maximum and average velocity between replicates in a set, the repeated measurement ANOVA method was used. Since there is no consistent pattern in a set, i.e. the number of repetitions does not slow down as new repetitions are performed; all repetitions from all exercises are used to calculate the mean. Average and maximum velocities for further analysis to determine if there is any difference between strength and power training in peak and average speeds, separate pairing tests were performed.

Discussion

The aim of this study was to determine if there was a difference in training speed when using resistance bands for strength and strength training during dorsal flexion and arch flexion in patients with older adults participating in a rehabilitation program in a day hospital. In this study, strength training occurred at a higher rate than strength training for both DF and PF. Studies to date have generally not measured speed during strength and power training. Apparently, it is assumed that when older adults are asked to perform movements “as quickly as possible”; they will perform the movement at a higher speed. In a previous study of strength training, it was observed that older women with reduced mobility participated in quite different training rates, which prompted this project. In the present study, speed was objectively measured between individuals over a wide range even though they were closely monitored and gave very specific instructions for each muscle contraction performed. This outcomes in some people having speed overlap between strength training and strength training, i.e. some people train at a faster pace during strength training than others get used to. for strength training. In addition, some individuals have only a small difference between strength and strength training rates, while an individual has 3 times higher speed during strength training than during strength training. It's not clear what this means for the effectiveness of a strength training program. For example, will people who train at a lower speed have a lower training response than those who train at a higher speed? More research with well-designed randomized trials is needed to determine how training speed affects training outcomes. In addition, research should be conducted to determine what factors, including age-related neuromuscular factors and health status, may be contributing to the speed at which older adults choose to exercise.

Conclusions

Although strength and strength training are beneficial forms of resistance training, it remains unclear whether strength training or strength training can produce different outcomes for tall people. year old. One of the intricacies of this type of research is how the training is done. With the common equipment used, there was no way to control movement speed, which was the essence of strength training. In this study, we investigated whether older adults participating in a day hospital rehabilitation program were able to exercise at a faster rate during strength training than during strength training. strong or not. They perform DF and PF contractions at a faster rate during strength training than during strength training. However, there is a wide range of speeds used by participants. Future research should examine individual responses to strength and strength training while examining how training is actually performed. This may provide some insight into the types of benefits that can be expected with these forms of resistance training.

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