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The effects of six months of progressive high effort resistance training methods upon strength, body composition, function, and wellbeing of elderly adults

Submission date
06/04/2017

Recruitment status
No longer recruiting

Registration date
17/05/2017

Overall study status
Completed

Last Edited
17/05/2017

Condition category
Other

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
Aging is associated with decline in physical function and so regular physical activity is recommended for older adults. In particular there is significant loss of strength and muscle mass and so 'muscle strengthening activities' such as resistance training are often recommended. An important factor in determining the success of resistance training programs might be the intensity of effort during training. However, this can be difficult for many individuals to accomplish, particularly if unsupervised. The aim of this study is to look at the effectiveness of a supervised resistance training program hat progressively introduces higher effort training over a period of 6 months in older adults.

Who can participate?
Adults aged 60 years and over who are in good health and have not previously engaged in resistance training.

What does the study involve?
All participants take part in supervised resistance training sessions twice a week for six months. In these sessions, participants perform a 10 minute warm up, followed by completing exercises using gym equipment such as a keg press or chest press. The number of reps and load (weight) is gradually increased over the course of the program. At the start of the study, after the program (six months) and then again six months later, participants have their strength, body composition, wellbeing and function assessed using a range of assessment tasks.

What are the possible benefits and risks of participating?
Participants benefit from being able to take part in supervised resistance training intervention, free for six months, which may results in improvements in strength, body composition, wellbeing, and function. The potential risks include injury or other complications as a result of the exercise program.

Where is the study run from?
University of Koblenz-Landau (Germany)

When is the study starting and how long is it expected to run for?
June 2012 to January 2014

Who is funding the study?
University of Koblenz-Landau (Germany)

Who is the main contact?
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Contact information

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Scientific

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Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers
SportsMedLandau2012-12-001

Study information

Scientific Title
In elderly adults does a progressive high effort resistance training intervention produce improvements in strength, body composition, function, and wellbeing, and are these maintained over a 6 month follow-up?

Study objectives
A six month supervised progressive high effort resistance training intervention will significantly improve strength, body composition, function, and wellbeing of elderly adults, and these improvements will be maintained in those continuing with unsupervised training during a six month follow up compared with those ceasing training.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Institute of Sport Science, University of Koblenz-Landau, Germany, 25/04/2012

Study design
Prospective non-randomised study

Primary study design
Interventional

Secondary study design
Non randomised study

Study setting(s)
Other

Study type(s)
Other

Participant information sheet
Not available in web format, please use the contact details below to request a patient information sheet

Health condition(s) or problem(s) studied

Exercise

Interventions
All participants take part in supervised training sessions conducted twice a week (at least 48 hours between sessions) for six months (25 weeks).

Participants all perform a general warm-up using either treadmill, cross-trainer, upright cycle ergometer, or recumbent cycle ergometer depending on preference for 10 minutes followed by a single set of moderate load leg press, chest press, and seated row for 15 repetitions prior to each training session. In each training session participants perform leg press, chest press, seated row, knee extension, knee flexion, trunk extension, and trunk flexion. The order of exercises is not fixed and depends upon preference and availability of equipment in the gym where training is conducted. Rest between exercises lasts for 2-4 minutes. Participants are instructed to perform the exercises using a relatively long repetition duration of at least 2 seconds concentric, 1 second pause at the top of the range of motion, and 2 seconds eccentric, and to not exceed 4 seconds concentric, 1 second pause at the top of the range of motion, and 4 seconds eccentric.

The first two weeks of the intervention is a familiarisation phase whereby participants trained using a single set of each exercise using a moderate load and performing 15-18 repetitions i.e. nRM. After this period participants progress for a further 2 weeks to perform each exercise to a set end of point of sdRM defined as cessation at the point where participants predict they would reach momentary failure if the next repetition was attempted. After this period participants progress to perform each exercise to a set end point of MF and continued training in this manner until week 18.

For the final 6 weeks of the intervention participants progress to perform each exercise to set end point of MF followed by a drop set whereby the load was reduced by ~5 kg and an additional set continued to the point of MF was performed immediately upon completion of the first. Load is progressed for each group by 2-10% in the next session if participants could achieve greater than 12 repetitions before reaching the defined set end point for their current period of training (in the case of the final 6 weeks this applied to the first set performed to momentary failure).

After the 25-week intervention participants wishing to continue performing resistance training unsupervised are given access to the training facility and allowed to train without direct supervision.

Intervention Type
Other

Primary outcome measure
Strength (5 repetition maximum) is measured using leg press, chest press, and seated row exercises at baseline, 6 months (post-intervention) and 12 months (6 months follow up).

Secondary outcome measures
1. Body composition is measured using bioelectrical impedance at baseline, 6 months (post-intervention) and 12 months (6 months follow up)
2. Wellbeing is measured using the WHO-% Wellbeing Index at baseline, 6 months (post-intervention) and 12 months (6 months follow up)
3. Function is measured using a stair climb, carrying task, chair rise and grip strength at baseline and 6 months (post-intervention)

Overall study start date
01/06/2012

Completion date
24/01/2014

Eligibility

Key inclusion criteria
1. At least 60 years of age
2. Present with a medical certificate verifying their otherwise good health
3. Not previously engaged in resistance training (RT)
4. No contraindication to participation in RT

Participant type(s)
Healthy volunteer

Age group
Senior

Sex
Both

Target number of participants
28

Key exclusion criteria
Participants were excluded if they had a pacemaker (due to the use of bioelectrical impedance analysis), failed to attend >4 training sessions, or did not meet the above criteria.

Date of first enrolment
10/12/2012

Date of final enrolment
21/12/2012

Locations

Countries of recruitment
Germany

Study participating centre
University of Koblenz-Landau
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Sponsor type
University/education

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ROR
https://ror.org/01j9f6752

Funder(s)

Funder type
University/education

Funder Name
University of Koblenz-Landau

Results and Publications

Publication and dissemination plan
Planned publication in a peer reviewed journal.

Intention to publish date
30/04/2017

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are/will be available upon request from Dr James Steele (James.steele@solent.ac.uk)

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	01/01/2017		Yes	No