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Growth of skeletal muscle in response to feeding different amounts of protein

Submission date
13/09/2012

Recruitment status
No longer recruiting

Registration date
01/10/2012

Overall study status
Completed

Last Edited
15/09/2015

Condition category
Musculoskeletal Diseases

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

Plain English summary of protocol

Background and study aims
Exercise and diet affect the muscles' ability to make new proteins (muscle protein synthesis). Consuming protein after resistance exercise increases muscle protein synthesis (e.g., for building muscle). However, the best dose of protein to consume is not currently known. If too much protein is consumed, then the excess will be used for energy rather than for building muscle. This information is needed to improve diet and exercise strategies to increase muscle mass not only for healthy young exercisers, but also for helping more vulnerable groups, such as the elderly, to maintain muscle mass. The aim of this study is to determine the response of muscle protein synthesis to different doses of whey protein consumed at rest and following resistance exercise.

Who can participate?
Trained male weightlifters aged between 18-35, who have been doing resistance training for at least 6 months.

What does the study involve?
Participants are randomly allocated to consume one of four doses of whey protein after exercise. Chemical tracers are injected into the bloodstream for delivery to the muscle, and blood and muscle samples are taken to determine the rate at which muscle proteins were made following each dose of protein.

What are the possible health benefits and risks of participating?
The results of this study may help both young and old people who would benefit from muscle growth. The risks of participation include the potential for pain due to the vigorous exercise. However, we used trained experienced weightlifters for this study. Taking a muscle sample may cause pain or discomfort. Injecting the tracers can cause pain or discomfort through infection. However, this is extremely rare.

Where is the study run from?
University of Birmingham (UK).

When is the study starting and how long it is expected to run for?
December 2008 to June 2011.

Who is funding the study?
GlaxoSmithKline Nutritional Healthcare (UK).

Who is the main contact?
Dr Oliver C Witard
oliver.witard@stir.ac.uk

Contact information

Type(s)
Scientific

Contact name
Dr Oliver Witard

Contact details
University of Stirling
School of Sport
Stirling
United Kingdom
FK9 4HG
+44 (0)1786 466 298
oliver.witard@stir.ac.uk

Additional identifiers

Protocol serial number
N/A

Study information

Scientific Title
Response of myofibrillar muscle protein synthesis to increasing doses of whey protein at rest and following exercise subsequent to a meal in resistance trained males

Study objectives
Twenty grams of whey protein will be sufficient for the maximal stimulation of myofibrillar-muscle protein synthesis (MPS) rates at rest and after resistance exercise in trained, young adult males.

Ethics approval required
Old ethics approval format

Ethics approval(s)
National Research Ethics Service, Black Country, Birmingham, 08/02/2012, ref: 08/H1202/131

Study design

Parallel research design single-blind intervention study

Primary study design
Interventional

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Metabolic health of muscle / sarcopenia (age-related muscle loss)

Interventions
Each participant was randomly assigned to one of four groups. Each participant ingested one of four doses (0, 10, 20 or 40g) of whey protein after the exercise.

Intervention Type
Supplement

Primary outcome(s)
Myofibrillar (contractile proteins) muscle protein synthesis

Key secondary outcome(s))
Amino acid concentrations

Completion date
01/06/2011

Eligibility

Key inclusion criteria
1. Male, aged 18-35 years
2. Healthy (no known metabolic disorder)
3. Experienced weight lifter for more than 6 months (at least 2 leg resistance training sessions per week)

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Upper age limit
35 years

Sex
Male

Key exclusion criteria
Not simultaneously taking part in another scientific / clinical study

Date of first enrolment
01/01/2008

Date of final enrolment
01/06/2011

Locations

Countries of recruitment
United Kingdom

Scotland

Study participating centre
University of Stirling
Stirling
United Kingdom
FK9 4HG

Sponsor information

Organisation
GlaxoSmithKline Nutritional Healthcare (UK)

ROR
https://ror.org/01xsqw823

Funder(s)

Funder type
Industry

Funder Name
GlaxoSmithKline Nutritional Healthcare (UK)

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not provided at time of registration

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	01/01/2014		Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes