

Effect of Two Types of Squat Exercise in anterior cruciate ligament (ACL) Injured Persons

Submission date 25/08/2015	Recruitment status No longer recruiting	<input type="checkbox"/> Prospectively registered
		<input type="checkbox"/> Protocol
Registration date 13/09/2015	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan
		<input type="checkbox"/> Results
Last Edited 14/09/2015	Condition category Musculoskeletal Diseases	<input type="checkbox"/> Individual participant data
		<input type="checkbox"/> Record updated in last year

Plain English summary of protocol

Background and study aims

One of the most common types of knee injury is an anterior cruciate ligament (ACL) sprain or tear. The ACL is one of the four main ligaments within the knee which connects the thigh bone (femur) to the shin bone (tibia). These injuries often result in loss of size and weakness in the quadriceps muscles (a group of four muscles in the thigh). This problem is not often addressed in current rehabilitation therapy and can put strain on other muscles, which can increase the risk of future injury. Studies have shown that full squats are far better for strengthening the quadriceps than partial squats, which are what is generally used in typical rehabilitation, as the body moves closer to the floor. Additionally, a modified squat in which the un-injured foot is raised may also be beneficial, as it focuses on restoring strength in the injured leg. The aim of this study is to investigate the benefits of full squat exercise in ACL injured people, and to find out if single-foot elevated squat exercises are better than normal squat exercises for their recovery.

Who can participate?

Adults with a one sided non-contact ACL injury that are able to participate in weight-bearing exercise.

What does the study involve?

Participants are randomly allocated into one of two exercise programs. Those in group 1 perform normal squat exercises for 10 weeks. Those in group 2 perform single-foot elevated squat exercises, where the un-injured leg is placed on a raised (elevated) surface. Single-foot elevated squats are a type of squat which focuses on building strength and improving the range of movement in one leg (in this case, the injured leg). The strength of knee extension, as well as the movements of the hip, knee and ankle are measured during sit-to-stand and vertical jump before and after the study.

What are the possible benefits and risks of participating?

Participants will benefit from restored muscle strength from the therapy, which is important for return to activity following an ACL injury. There are no anticipated risks of participating in the study.

Where is the study run from?
University of Alberta (Canada)

When is the study starting and how long is it expected to run for?
September 2015 to August 2016

Who is funding the study?
National Strength and Conditioning Association (Canada)

Who is the main contact?
1. Miss Liane Jean (Scientific)
2. Dr Loren Chiu (Public)

Contact information

Type(s)
Scientific

Contact name
Miss Liane Jean

Contact details
3-413 Van Vliet Complex
University of Alberta
Edmonton
Canada
T6G 2H9

Type(s)
Public

Contact name
Dr Loren Chiu

Contact details
3-413 Van Vliet Complex
Edmonton
Canada
T6G 2H9

Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers
N/A

Study information

Scientific Title

Comparison of Normal and Single-Foot Elevated Full Squats in ACL Injured Persons

Study objectives

This research will compare the effectiveness of normal and single-foot elevated squat exercise to restore quadriceps strength and function in the involved limb of anterior cruciate ligament (ACL) injured persons prior to surgery. It is hypothesized that single-foot elevated squats will be more effective for restoring quadriceps strength and function versus normal squats.

Ethics approval required

Old ethics approval format

Ethics approval(s)

University of Alberta Research Ethics Board 2, 11/09/2015, ref: Pro00058914

Study design

Single-centre randomised parallel trial

Primary study design

Interventional

Secondary study design

Randomised controlled trial

Study setting(s)

Other

Study type(s)

Treatment

Participant information sheet

Health condition(s) or problem(s) studied

Non-contact anterior cruciate ligament rupture

Interventions

This trial will recruit up to 40 individuals with non-contact ACL injury. Participants will be randomly assigned to one of two exercise groups. Both groups will perform identical 10 week exercise programs, with the exception of type of squat exercise. One group will perform normal squat exercise while the second group will perform single-foot elevated squats.

Intervention Type

Other

Primary outcome measure

1. Isometric knee extension strength will be measured using an isometric strength testing dynamometer before and after 10 week exercise program
2. Hip, knee and ankle net joint moments during sit-to-stand. Sit-to-Stand biomechanics will be

measured using 3D motion analysis and force platforms, before and after 10 week exercise program

Secondary outcome measures

Hip, knee and ankle net joint moments during vertical jump and land. Vertical jumping and landing biomechanics will be measured using 3D motion analysis and force platforms, after 10 week exercise program.

Overall study start date

01/09/2015

Completion date

31/08/2016

Eligibility

Key inclusion criteria

1. Aged between 16 and 40 years
2. Unilateral, non-contact ACL injury
3. Clearance from surgeon and/or physiotherapist to participate in weight-bearing exercise

Participant type(s)

Patient

Age group

Mixed

Sex

Both

Target number of participants

40

Key exclusion criteria

1. Have had ACL reconstruction
2. Bilateral ACL injury
3. Symptomatic meniscal injury that prevents full knee flexion/extension range of motion

Date of first enrolment

07/09/2015

Date of final enrolment

31/05/2016

Locations

Countries of recruitment

Canada

Study participating centre
University of Alberta
75 Van Vleet Centre
Edmonton
Canada
T6G 2H9

Sponsor information

Organisation

University of Alberta - Faculty of Physical Education and Recreation

Sponsor details

3-100 University Hall
Van Vleet Complex
Edmonton
Canada
T6G 2H9

Sponsor type

University/education

ROR

<https://ror.org/0160cpw27>

Funder(s)

Funder type

Charity

Funder Name

National Strength and Conditioning Association

Results and Publications

Publication and dissemination plan

Data from the results will be submitted as abstracts to present at conferences. A manuscript including the primary and secondary outcomes will be submitted for publication.

Intention to publish date

31/10/2016

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Not provided at time of registration