Failed adaptability in motor programming after ACL injury ?

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Ethical review	Approved WMO
Status	Pending
Health condition type	Tendon, ligament and cartilage disorders
Study type	Observational non invasive

Summary

ID

NL-OMON31100

Source
ToetsingOnline

Brief title
Motor programming after ACL injury

Condition

- Tendon, ligament and cartilage disorders

Synonym
Anterior cruciate ligament, surgery

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Groningen
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: Anterior cruciate ligament (ACL), Motor program, Rehabilitation

Outcome measures

Primary outcome

EMG latency of the quadriceps and hamstrings and gastrocemius.

Secondary outcome

IKDC score

Study description

Background summary

Most athletes who sustain an injury to the ACL and want to stay active in of sports elect to have their injured ACL reconstructed. However, successful ACL-reconstruction in terms of restoring the ligaments of the knee joint does not automatically mean restoration of normal knee function. For example, normal walking is regained in only 31% of ACL-reconstructed patients 1 year after surgery. In addition, functional abnormalities have also been reported in more demanding tasks such as jumping. The findings of these functional deficits reported in the literature are not fully understood until now. It appears that patients sustaining an ACL injury develop an adaptive motor programm. An ACL injury leads to a loss of proprioception in the knee-stabilizing muscles of the thigh. Indeed, direct reflex pathways haven been reported between the ACL and the muscles around the knee. An increase in the latency of the hamstring reflex induced by anterior tibia translation, may be induced by a deficient proprioception. There is some evidence that a lesion of the ACL results in:
1) Modifications in the response properties of the Central Nervous System (CNS) such as increased response threshold or latency
2) Changes of the cortical representation by afferent inputs of the nearest areas;
3) Reorganization of the spinal input.
These changes were present after injury of the ACL, but interestingly persisted after reconstruction of the ACL. This implies that cognitive changes in motor control may have occurred after injury of the ACL.
It is hypothesized that patients (un-)consciously hold on to the protective motor program that suited the first post-injury period but may not be functional anymore six months ore longer after surgery. Hence, the latency reflexes are the primary interest of this study as information can be gathered

about possible alterations in CNS processing after the injury.

Study objective

The goal of the study is to gain insight in the changes in motor control programming after injury to the ACL and subsequent reconstruction of the ACL. The following hypotheses: will be tested:
1. Reflex latencies on the involved side are increased when compared to the uninvolved side in patients
2. Reflex latencies in the involved side in patients are increased when compared to control subjects.
3. Reflex latencies in side to side comparison in patients are increased under dual task conditions when compared to healthy subjects

Study design

The study will be a longitudinal observational study. Patients will be tested pre-operatively within 1 year after they sustained an injury to the ACL . Post-operatively they will be tested at 6 months and finally at 1 year. The healthy controls will only be tested once to establish comparison data.

Study burden and risks

Minimal risk or discomforts, as physical injury or harm, to the subjects as a result of each procedure is involved in this study as this research proposal is viewed as involving little or no risk to human subjects. The main possible risk of injury is giving way during the performance of the task. However, the probability and magnitude of harm or discomfort anticipated in the proposed research are not greater than those ordinarily encountered during the performance of routine athletic activities. Furthermore, in order to minimize the risk of injury, the subjects are well-trained healthy athletes and they have the opportunity to get familiar with the movements before starting the measurements.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

Patients between age 18-45
Injury < 1 year
Arthroscopic ACL reconstruction
Standardized rehabilitation
Intention to participate in sports after surgery
Completion of IKDC-score
Healthy athletic subjects age 18-45

Exclusion criteria

Swelling and pain of the operated knee joint
Varus malalignment of the knee
Grade 3 rupture of the collateral ligaments
Concomitant ligamentous injuries to the posterolateral corner
> 50% base menisectomie
Traumatic cartilage injuries
Degenerative changes of the knee joint
Surgical procedures or injuries to the contralateral leg
Neurological and/or vestibular disease

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Allocation:	Non-randomized controlled trial
Masking:	Open (masking not used)

Primary purpose: Basic science

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	01-10-2007
Enrollment:	30
Type:	Anticipated

Ethics review

Approved WMO

Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
CCMO	NL17812.042.07