Neuropathic pain and Proprioceptive Acuity in Knee osteoarthritis

Published: 25-09-2017 Last updated: 12-04-2024

To gain first insight into the association between knee proprioception and joint related neuropathic pain in patients with symptomatic knee OA.Primary Objective: To study the association between joint related neuropathic pain (measured with the...

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Joint disorders
Study type	Observational non invasive

Summary

ID

NL-OMON44621

Source ToetsingOnline

Brief title NPAK-study

Condition

• Joint disorders

Synonym degenerative arthritis, Osteoarthritis

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: knee, neuropathic like symptoms, osteoarthritis, proprioception

Outcome measures

Primary outcome

Joint motion sense expressed by the threshold to detect passive motion (TTDPM) in degrees and neuropathic pain, defined by the score on the knee-specific Dutch modified-painDETECT questionnaire.

Secondary outcome

1) Joint positioning sense (determined with Mr Cube) expressed by the deviation in millimetres from a marker and neuropathic pain, defined by the score on the knee-specific Dutch modified-painDETECT questionnaire.

2) Pain catastrophizing, determined by continuous score on the pain catastrophizing scale (PCS) and motion and positioning sense. Motion sense is defined by the threshold to detect passive motion (TTDPM) in degrees and the joint position sense is expressed as the deviation in millimetres from a marker (determined with Mr Cube).

Study description

Background summary

Pain, next to limitation of function, is the most prominent symptom in patients with knee osteoarthritis (OA). From research we know that there is a possible cross-sectional relationship between knee pain and impaired proprioceptive accuracy, however evidence is conflicting. Proprioception is defined as *the perception of movement and

2 - Neuropathic pain and Proprioceptive Acuity in Knee osteoarthritis 4-05-2025

position of body segments in relation to each other without the aid of vision* It seems to be a key element in maintaining proper knee-function, as it protects the knee against possible injurious movements via reflex responses, stabilize the knee during static posture and coordinates precise knee joint motions.

To date, the causes of impaired proprioception within knee OA patients remain unclear. The general hypothesis is that mainly dysfunctional mechanoreceptors and muscle weakness may lead to impaired proprioceptive accuracy. However, to our knowledge no strong evidence was found to confirm this hypothesis. Another hypothesis is that nociceptive input may overrule proprioceptive input, so impairing proprioceptive accuracy. Furthermore there are indications that proprioception could be impaired due to a more general sensitized state of the body, called central sensitisation (CS).

As stated studies about the relation between knee pain intensity and proprioceptive accuracy are conflicting, for both motion and position sense. A recent review stated that six cross-sectional studies found an association, where five studies did not. A recent study suggested that a relationship between catastrophisation of pain rather than the intensity of pain could affect performance on proprioceptive tests, so taking into account pain catastrophizing seems to be essential. Also none of these pain-related studies investigated the association of neuropathic pain symptoms and proprioception. Over the past decade, it has become clear that OA pain symptoms varies among patients with knee OA, from nociceptive pain to neuropathic pain . Multiple studies showed that about 20-40% of the knee OA patients experience significant neuropathic pain symptoms. These symptoms may be explained by OA-induced changes in the biochemical environment around peripheral joint nociceptors and joint structures, combined with complex OA-related somatosensory changes (like CS).

It has never been studied whether these neuropathic pain symptoms are associated with impaired proprioception. It is possible that due to the OA-induced changes, proprioceptive accuracy becomes impaired in a subset of patients who are experiencing neuropathic pain symptoms. This information may provide additional support for the need to better customize conservative OA treatment, as treatment of neuropathic pain symptoms could theoretically lead to better proprioceptive accuracy. Therefore the aim of the present pilot study is to gain first insight into the association between knee proprioception and joint related neuropathic pain symptoms in patients with symptomatic knee OA.

Study objective

To gain first insight into the association between knee proprioception and joint related neuropathic pain in patients with symptomatic knee OA.

Primary Objective:

To study the association between joint related neuropathic pain (measured with the modified-painDETECT questionnaire) and proprioceptive acuity (motion sense, measured by the threshold to detect passive motion [TTDPM]). Associations will be adjusted for the relevant covariates age, sex, and functional lower limb muscle strength (FTSST).

Secondary Objectives:

1) Study the association between joint related neuropathic pain (measured with the modified-painDETECT questionnaire) and proprioceptive acuity (position sense, measured by the Mr Cube method). Associations will be adjusted for the relevant covariates age, sex, and functional lower limb muscle strength (FTSST).

2) Study the association between pain catastrophizing and proprioceptive acuity, both motion and position sense. Associations will be adjusted for the relevant covariates age, sex, and lower limb muscle strength (FTSST).

Study design

Pilot study with a cross-sectional design. This observational study will include patients with symptomatic osteoarthritis (OA) of the knee.

Study burden and risks

Not applicable

Contacts

Public Universitair Medisch Centrum Groningen

Hanzeplein 1 Groningen 9700 RB NL **Scientific** Universitair Medisch Centrum Groningen

Hanzeplein 1 Groningen 9700 RB NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age

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

Inclusion criteria

• Clinical symptoms of primary symptomatic knee osteoarthritis (judged by an experienced clinician);

• Kellgren and Lawrence grade (Anterior-posterior view) >= 1 (X-ray made < 12 months prior to enrolment).

Exclusion criteria

- Surgical procedures on lower index extremity <= 6 months ago;
- Arthroscopy <= 3 months ago;
- Medical history of significant peripheral nerve injury in the index extremity (e.g. diabetic neuropathy);
- Acute knee or tendon injuries (or other trauma explaining the knee pain);

• Medical history of severe cognitive and/or neurological/neuromuscular disorders (e.g. dementia, MS);

- ASA-score: >= IV;
- Unable to sit or lie on one side to do the TTDPM measurements correctly;
- Reading difficulties, blind, or difficulties with the Dutch language.

Study design

Design

Study type: Observational non invasive		
Masking:	Open (masking not used)	
Control:	Uncontrolled	
Primary purpose:	Prevention	

Recruitment

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	11-09-2017
Enrollment:	50
Туре:	Actual

Ethics review

Approved WMO	
Date:	25-09-2017
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 CCMO ID NL62485.042.17