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Does thumb joint mobilization decrease hyperalgesia in elderly patients with secondary thumb carpometacarpal osteoarthritis?

Submission date
19/05/2011

Recruitment status
No longer recruiting

Registration date
26/05/2011

Overall study status
Completed

Last Edited
30/06/2017

Condition category
Musculoskeletal Diseases

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
Osteoarthritis is the most common joint disorder in the United States and one of the leading causes of disability in the elderly. It develops relatively frequently at the trapeziometacarpal joint (TMJ) of the thumb, often as a result of athletic injury or an arduous occupation or hobby. Thumb carpometacarpal osteoarthritis occurs more often in women, typically in their fifth and sixth decade of life. The main cause of thumb CMC osteoarthritis is deterioration of the surfaces of the joint and abnormal bone growth, leading to pain and hand function impairment. The aim of this study is to find out whether mobilization of the TMJ decreases pain and increases pinch and grip strength in patients with thumb carpometacarpal osteoarthritis.

Who can participate?
Patients aged between 70 and 90 with thumb carpometacarpal osteoarthritis

What does the study involve?
Participants are randomly allocated to be treated with either glide mobilization or sham treatment. Participants in the sham treatment group attend the same number of sessions as those in the glide mobilization group, but they receive ultrasound sham treatment for 10 minutes on the dominant hand. Pain, pinch and grip strength are measured before treatment and after one and two weeks.

What are the possible benefits and risks of participating?
Not provided at time of registration

Where is the study run from?
Azienda Sanitaria Locale (ASL) 3 (Italy)

When is the study starting and how long is it expected to run for?
December 2009 to September 2010

Who is funding the study?
1. Rey Juan Carlos University (Spain)
2. Azienda Sanitaria Locale (ASL) 3 (Italy)

Who is the main contact?
Dr Jorge Villafañe

Contact information

Type(s)
Scientific

Contact name
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Study information

Scientific Title
Hypoalgesic effects of glide mobilization on elderly patients with secondary thumb carpometacarpal osteoarthritis - a randomized, controlled trial

Study objectives
The aim of this study was to determine whether specific mobilization of posterior-anterior gliding of the trapeziometacarpal joint (TMJ) decreases mechanical hyperalgesia and increase the strength of the tip pinch and tripod pinch in patients with secondary carpometacarpal osteoarthritis in the dominant hand.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Local Health Authority, Collegno, Italy (Residenze Sanitarie Assistenziali Azienda Sanitaria Locale 3 (A.S.L 3), Collegno Italy) ref: 93571/c

Primary study design
Interventional

Study design
Randomized controlled trial

Study type(s)

Treatment

Health condition(s) or problem(s) studied
Thumb carpometacarpal osteoarthritis (TCOA)

Interventions
1. Glide mobilization
1.1. We performed a glide mobilization also known as mobilization of posterior-anterior gliding of the TMJ, taking into account the convex/concave rule
1.2. The direction of decreased joint gliding in a hypomobile joint and thus appropriate treatment can be deduced by this rule
1.3. Movement of a concave joint partner the glide occurs in the same direction
1.4. The form of the joint surface has been considered to induce its gliding movement: a female (concave) joint surface glides in the same direction as the bone movement, while a male (convex) surface is gliding in the opposite direction of the bone movement
1.5. The subject is seated with his arm in the anatomic position, the elbow at 90° flexion, and the forearm and hand with the cubital face downwards and the dorsal face against the body of the physiotherapist
1.7. The physiotherapist takes the right thumb metacarpal bone of the subject with his right thumb and index finger and makes a specific glide mobilization of posterior-anterior gliding of the TMJ for 3 minutes with a 1 minute pause; the action is repeated three times
1.8. The physiotherapist glides the first metacarpal bone in a posterior-anterior orientation
1.9. In the posterior-anterior gliding movement of the first metacarpal bone, the head and body must slide in the same way because the articular surface of the trapezium is convex and the surface of the first metacarpal bone is concave
1.10. The gliding movement respects the rule of convexity-concavity of the joint

2. Sham group
2.1. Participants in the sham group attended the same number of sessions as did those in the glide mobilization group, but they received applying intermittent ultrasound with non-therapeutic actions for 10 minutes on in the hypothenar area of the dominant hand
2.2. Gel was used as required

Intervention Type
Other

Phase
Not Applicable

Primary outcome(s)
1. Pain measurement
1.1. The pressure pain threshold (PPT) was measured by using a mechanical pressure algometer (Wagner Instruments, Greenwich, CT, USA) with a 1cm2 rubber-tipped plunger mounted on a force transducer
1.2. The PPT is defined as the minimum amount of pressure that results in the sense of pressure changing to pain
1.3. The mean of three measurements (intra-examiner reliability) was calculated and used for the main analysis
1.4. The range of values of the pressure algometer was 0 to 10 kg, with a minimal sensibility of 0.1 kg
1.5. For these specific cases, the algometry has higher reliability (Intra-class correlation

coefficient [ICC]=0.91, Interval confidence [IC] del 95%: 0.82-0.97) for PPT measurement in older patients
1.6. In addition, previous studies have reported an intra-examiner reliability for this procedure ranging from 0.6 to 0.97, and the inter-examiner reliability ranged from 0.4 to 0.98
1.7. PPT measurements were collected at both thecarpometacarpal (CMC) joint at the bottom of the anatomical snuffbox and tubercle of the scaphoid bone
2. Strength measurements
3. Pinch strength
3.1 The pinch strength was measured by a mechanical pinch gauge (Baseline, NY, USA) while the patient was in the sitting position with the shoulder adducted and neutrally rotated and the elbow flexed at 90°
3.2. Two different measurements were taken: first, the tip pinch between the index finger and thumb and, then, the tripod pinch between the index and medial fingers and the thumb 3.3. The reliability of this procedure to measure the pinch strength has been found to be on the order of 0.93
4. Grip strength measurements
4.1. Grip strength measurements were taken with a grip dynamometer (Baseline, NY, USA) while the patient was also in the sitting position, which has a precision and reliability of ± 3% for grip strength measurements
4.2. The reliability of the measurements was expressed by ICC between 0.82 and 0.97 for grip strength measurements
5. Pinch strength
5.1. The pinch strength was measured by a mechanical pinch gauge (Baseline, NY, USA) while the patient was in the sitting position with the shoulder adducted and neutrally rotated and the elbow flexed at 90°
5.2. Two different measurements were taken: first, the tip pinch between the index finger and thumb and, then, the tripod pinch between the index and medial fingers and the thumb 5.3. The reliability of this procedure to measure the pinch strength has been found to be on the order of 0.93

Key secondary outcome(s)
No secondary outcome measures

Completion date
30/09/2010

Eligibility

Key inclusion criteria
1. Patients who used the dominant hand systematically such as ex-factory workers and home workers
2. Diagnosed with secondary thumb carpometacarpal osteoarthritis (TCOA) in the dominant hand by X-ray detection of stage III and IV according to the Eaton-Littler-Burton Classification
3. The population of the study was 70-90 years old and were male and females

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Senior

Sex
All

Key exclusion criteria
1. Patients with a medical history of carpal tunnel syndrome, arthritis, surgical interventions on CMC joint, or DQuervains tenosynovitis
2. Patients presenting degenerative or non-degenerative neurological conditions in which pain perception was altered

Date of first enrolment
20/12/2009

Date of final enrolment
30/09/2010

Locations

Countries of recruitment
Italy

Study participating centre
Via C. colombo 2/9
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Sponsor information

Organisation
Azienda Sanitaria Locale (ASL) 3 (Italy)

ROR
https://ror.org/05xcney74

Funder(s)

Funder type
University/education

Funder Name
Rey Juan Carlos University (Spain)

Funder Name
Azienda Sanitaria Locale (ASL) 3 (Italy)

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not provided at time of registration