The differences in shoulder kinetics and kinematics during functional movements between young adults, healthy elderly and elderly with subacromial pain syndrome.

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This study has two objectives: (1) To determine the influence of joint angular velocity on torque production in the shoulder joint during functional movements in young adults, healthy elderly and elderly with subacromial pain syndrome. (2) To...

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

Summary

ID

NL-OMON42236

Source
ToetsingOnline

Brief title
Shoulder function of healthy adults and SAPS patients.

Condition

- Other condition

Synonym
Subacromial shoulder disorders

Health condition

Schouderklachten

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: activities of daily living, Shoulder kinematics, Shoulder kinetics, Subacromial painsyndrome

Outcome measures

Primary outcome

The primary outcome measures of the first objective are the shoulder torque and shoulder power production during functional tasks, and the associated joint angular velocity, during performance of the ADL tasks. The ratio between eccentric and concentric torque will be analysed. Also the maximal isokinetic muscle strength, recorded by the KinCom dynamometer will be used.
Pain during the measurements will be checked. Between the different KinCom measurements, the participants will be asked to fill out the Visual Analogue Scale, to check if he/she experiences pain, and if he does how much pain he experiences.

For the second objective, the shoulder joint angles (active range of flexion/extension, abduction/adduction in frontal plane, internal/external rotation) during functional tasks and the isometric shoulder muscle strength (in terms torque) will be investigated.
The SF-36 health survey questionnaire (SF-36) measures the physical health

(physical functioning, role-physical, bodily pain and general health) and the mental health (Vitality, Social functioning, role-emotional, mental health). For each domain a sub-score will be calculated, and the total score indicates the overall health.

For measuring the experienced pain and problems in the shoulder joint during daily activities, the shoulder disability questionnaire will be filled out (27). This is a questionnaire that measures the sub-domains pain and restrictions in activities. The items are scored on a VAS scale, and the total score will be between 0 and 100.

Pain during the measurements will be checked. Between the different KinCom measurements, the participants will be asked to fill out the Visual Analogue Scale, to check if he/she experiences pain, and if he does how much pain he experiences.

Secondary outcome

Not applicable

Study description

Background summary

Previous research has shown that elderly above the age of 55, are more likely to develop shoulder problems than younger adults. Moreover healthy elderly also have restrictions compared with young adults. The most common shoulder complaint amongst elderly is subacromial pain syndrome (SAPS), which can lead to pain and difficulties performing activities of daily living (ADL).
Identifying the limited activities that need extra support in patients with

SAPS would be very helpful for diagnostic and rehabilitation purposes.
These limitations while performing ADL could be a consequence of pain but also of a decrease in range of motion (ROM) and torque production. Torque is a result of muscular, ligament and friction forces acting to change the angular rotation of a joint. It is known that torque production is diminished with an increased angular velocity (velocity of joint movement). More information about the exact extent of these impairments could help clinicians develop an exercise program to reduce limitations in torque and range of motion and to maintain a good quality of life.
Available literature often reports on the maximal ROM or torque production. However, the maximal range is often not necessary to perform ADL. Therefore it would be relevant to measure the changes in shoulder ROM and torque production while functional activities are performed. In this study we propose to measure young adults, healthy elderly and elderly with SAPS to identify and distinguish between age-related changes in shoulder function and changes associated with SAPS. On the basis of this study it could become possible to identify the limiting underlying mechanism in the performance of ADL in both healthy elderly and elderly with SAPS.

Study objective

This study has two objectives:
(1) To determine the influence of joint angular velocity on torque production in the shoulder joint during functional movements in young adults, healthy elderly and elderly with subacromial pain syndrome.
(2) To determine the relationship between range of motion measured during functional movements and the maximal isometric muscle strength in young adults, healthy elderly and elderly with subacromial pain syndrome.

Study design

This pilot study consists of a cross sectional design with three different groups.

Study burden and risks

The KinCom equipment is set to the abilities of each patient, which means that the range of measurement of the equipment is set within the pain-free area of motion. To protect the participants during the measurements, the KinCom dynamometer is supplied with mechanical stops and safety belts, to prevent exceeding the range of movement and protect the patient from falling. Furthermore the KinCom dynamometer has an emergency stop, which the participant can use in case of an emergency/discomfort. With this emergency stop, the participant can immediately stop the movement of the KinCom. The measurements with the KinCom dynamometer are within the range of the activities that need to be performed during daily living.

During the measurements with the Optotrak motion capture system, markers will be attached with tape on the skin. Removing the markers after the measurements may result in temporary local irritation of the skin. There are no other risks that are larger than during daily live.

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

For the healthy subjects:
Men and women, aged between 20-30 years or above 55 years
Being able to read/understand Dutch
Being able to give an informed consent;For the SAPS patients.
Men and women, aged above 55 years
Being able to read/understand Dutch

Being able to give an informed consent
Pain free shoulder for the past 6 months prior to the current episode, without earlier surgery.
Pain upon abduction of the shoulder with painful arch
Chronic (longer than 3 months)

Exclusion criteria

For the healthy subjects
Upper extremity pathologies that could interfere with the measurement results
Presence of specific rheumatic diseases, dementia or other psychiatric disorders.
History of severe trauma of the shoulder within the previous two years (e.g. fracture, luxation);For the SAPS patients
Presence of frozen shoulder,
Other upper extremity pathologies that could interfere with the measurement results
Incapable of abducting or elevating (anteflexion) the affected arm > 30 degrees
Previous surgery of the affected shoulder
Presence of dementia or other psychiatric disorders, specific rheumatic diseases or a full thickness rotator cuff rupture
History of severe trauma of the shoulder within the previous two years (e.g. fracture, luxation)

Study design

Design

Study type: Observational non invasive

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Basic science

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	04-02-2015
Enrollment:	30
Type:	Actual

Ethics review

Approved WMO Date:	21-01-2015
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)
Approved WMO Date:	21-07-2015
Application type:	Amendment
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	NL51664.042.14