Journal of Hand Therapy xxx (2016) 1–6

Contents lists available at ScienceDirect

Journal of Hand Therapy

journal homepage: www.jhandtherapy.org

Scientific/Clinical Article

Moberg Picking-Up Test in patients with hand osteoarthritis

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ARTICLE INFO

Article history:
Received 19 February 2015
Received in revised form
1 September 2016
Accepted 12 October 2016
Available online xxx

Keywords:
Osteoarthritis
Hands
Dexterity
Rehabilitation

ABSTRACT

Study Design: Clinical measurement.
Introduction: The Moberg Pick-up Test (MPUT) was previously used to evaluate functional performance in patients with hand inflammatory disease. This is the first study using the MPUT in hand osteoarthritis (OA).
Purpose of the Study: Compare the functional performance (MPUT) in hand OA patients and healthy controls.
Methods: Fifty hand OA patients and 50 controls were assessed using the MPUT, AUSCAN and Cochin questionnaires, grip and pinch strength, pain using a visual analog scale and a Likert scale regarding difficulty to perform MPUT.
Results: In the MPUT evaluation, the OA group presented a statistically significant difference from the control group. The OA group spent more time executing test. The grip and pinch strength measurements showed higher values for the control group. The OA group reported a greater difficulty than the control group in performing the test.
Conclusion: The MPUT is a short and easy to apply test, which can be safely used to assess the functional performance of the hand OA.
Level of evidence: II.

Introduction

Osteoarthritis (OA) is a disabling disease with high rates of functional impairment. It is considered a highly prevalent joint disease.[1]

Loss of joint cartilage occurs in OA, but all components of the joint, including ligaments, tendons, joint capsule, synovial membrane, and periarticular bone, undergo functional degeneration, as the disease progresses.[2]

Hands are frequently affected by OA, and the proximal interphalangeal (PIP), distal interphalangeal (DIP), and carpometacarpal joints are more involved. This may present various degrees of deformities, causing decreased pinch and grip strength, plus functional decline in basic and instrumental daily life activities.[3]

The most common deformities in hand OA are nodules that affect the PIP and DIP joints, called Bouchard and Heberden nodules, respectively.[4-6] These deformities, pain, and functional limitations of the hand negatively influence patients' functionality, which decreases the quality of life.[7-9]

One of the goals of hand OA treatment is to improve functional performance. For this, patients are referred to rehabilitation, including occupational and physical therapy.[10]

To measure the clinical effects of treatment and the evolution of the disease, self-report questionnaires[10] and functional performance tests are recommended. According to the European League Against Rheumatism,[11] many validated instruments are available to assess hand function, including the Health Assessment Questionnaire, Arthritis Hand Function Test, Arthritis Impact Measurement Scale 2, Cochin scale, Score for Assessment and quantification of Chronic Rheumatic Affections of the Hands, Functional Index for Osteoarthritis of the Hand, and Australian/Canadian Osteoarthritis Hand Index (AUSCAN). None of them is considered an universal instrument, and the selection should be done mainly by the clinical question. Between them, the European League Against Rheumatism recommends the use of AUSCAN, Cochin scale, and Functional

Conflict of interest: All named authors hereby declare that they have no conflicts of interest to disclose.

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0894-1130/$ – see front matter
http://dx.doi.org/10.1016/j.jht.2016.10.005

Index for Osteoarthritis of the Hand in clinical researches to measure pain and function. However, there are no guidelines for hand tests to evaluate functional performance.

The Moberg Picking-Up Test (MPUT) was developed by Moberg in 1958 to assess the ability and skill of the hand to identify small objects, with and without using the vision. The pickup test was developed to evaluate the functional sensibility of an injured hand and has been recommended as an important sensory assessment. The test results have a functional value because they reflect manual performance.[12] The test strongly depends on motor control of the thumb, forefinger, and middle finger.[13] The results of the MPUT have functional value because in addition to assessing stereognosis, they reflect motor performance.[14] Dellon[13-15] believed that patients recognize objects in the MPUT by temperature and texture and developed a modified version of the test, recommending only metal objects for recognition.

Besides, the MPUT was developed to evaluate the functional sensibility other authors have been used it as a functional performance test. Stamm et al[10,16] used the MPUT as a functional performance test for the upper limbs in inflammatory joint diseases and concluded that this test is an alternative instrument to assess the hand functional status in those patients. There is evidence[10,16] that MPUT is a functional test easily applied that does not require specialized training, but a short-time performance, which can be used to functionally evaluate the hand in patients with inflammatory joint disease.

However, there are no studies that used the MPUT as a functional performance test in hand OA patients to evaluate the functional status of the hand, and there is not a gold standard tool for patients with OA of the hand.[17] Because OA is a disease with frequent complains of pain and hand deformity, the purpose of this study was to determine the relationship between functional performance (MPUT) with other previous outcomes in the assessment of patients with OA of the hands and compare them with healthy controls to assess the test reproducibility for patients with OA of the hands.

Material and methods

This is a clinical measurement study that compares 2 specific groups comprising 100 subjects: 50 diagnosed with OA in the dominant hand with the presence of Heberden or Bouchard nodules (OA group) and 50 healthy individuals, age matched and gender matched, without impairment of the upper limbs (control group).

The inclusion criteria for the study were diagnosis of symptomatic nodal OA in the II or III fingers of the dominant hand, palmar abduction of the dominant thumb between 45° and 35°,[18] allowing the grip and pinch function, both genders, aged between 40 and 80, and the absence of hand impairments that might interfere with object manipulation. The exclusion criteria were other rheumatic and musculoskeletal conditions that could compromise the upper limb, pregnancy, and cognitive deficits that prevented participants from understanding the assessment instruments.

Individuals in the OA group were recruited in the outpatient care at the university, and all the patients who fulfilled the criteria and agreed to participate were included consecutively. The control group participants were the patients' caregivers and people who circulated in the 2 clinics. All the participants read, understood, and signed a consent form concerning the research. The study was approved by the Ethics Committee of the University.

Evaluations

Participants performed a single evaluation: they were first evaluated by a rheumatologist who performed a diagnostic examination and then by an occupational therapist who applied the test and questionnaires.

Demographic data regarding gender, hand dominance, level of education, profession, and duration of disease and the following instruments were applied:

- MPUT—To evaluate functional performance; the test consists of 10 metal objects that must be recognized by the participant. The test is timed, and participants follow the application protocol blindfolded, using both the dominant and nondominant hands at every step. The participant chose which hand to use first during testing.[14,15]
- Difficulty in performing the MPUT—We used a Likert-type scale in which participants reported the degree of difficulty in performing the test. Responses were given as one of the following alternatives: no difficulty, very little difficulty, some difficulty, much difficulty, almost impossible to accomplish, and impossible to accomplish.
- Cochin questionnaire—It is a generic questionnaire that assesses the functional capacity of the hand. The Cochin scale is a questionnaire completed by the practitioner in the light of the patient's answers to 18 questions concerning daily life activities, each question being scored from 0 (performed without difficulty) to 5 (impossible to perform). Disability was recorded as the total score obtained by adding the scores of all questions (range, 0-90).[19,20]
- Grip strength—It is assessed by grip dynamometer (JAMAR [Jamar North Coast; North Coast Medical, Inc, Gilroy, CA, USA]); 3 measurements were recorded following the American Society of Hand Therapists recommendations, and the average was reported as the result.[21]
- AUSCAN—It is a questionnaire that assesses the 3 dimensions of pain, disability, and joint stiffness in hand OA using a battery of 15 questions. Scaled on a 5-point Likert scale, 10 cm visual analog scale, and 11-box Numerical Rating Scale, the AUSCAN is a valid, reliable, and responsive measure of outcome. The total score is the sum of the 3 dimensions with a maximum score of 60 points and the higher, the worse.[22]
- Pinch strength—It is evaluated via tip to tip, tripod, and lateral pinches through dynamometer. Three measures were recorded following the Association of Hand Therapy recommendations, and the average was reported as the result.[23,24]
- Pain—Patient-reported hand pain was measured using a visual analog scale measured in centimeters (0-10 cm).[25] We evaluated pain overall for both hands and specifically for the II and III fingers of the dominant hand; these evaluations were conducted both at rest and during manual activity.

The tests were applied following the sequence presented previously; therefore, the questionnaires were interspersed with the functional test providing a period of rest.

A radiologic classification of hand OA by radiologic examination was performed by a single radiologist using the criteria proposed by Kellgren and Lawrence.[26] The classification recorded corresponded to the worst level identified in each group of analyzed joints (PIPs and DIPs).

Statistical analysis

The number of participants for the study was calculated based on the mean and standard deviation MPUT scores (18.23 ± 5.97) reported by Loss et al,[15] with beta = 80% and alpha = 5%. Therefore, it was necessary to include 50 participants in each study group.

Descriptive data were analyzed by calculating means and standard deviations for continuous variables and proportions for