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A systematic search and critical review of measures of disability for use in a population survey of hand osteoarthritis (OA)[1]

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Summary

Objective: In order to develop a hand assessment questionnaire for a population survey, a systematic review was undertaken of measures of hand disability. The purpose of this review was to identify valid measures to evaluate hand osteoarthritis (HOA) in the general population and primary care and to perform a quality appraisal of them.

Method: Measurement tools were identified from an online search of databases (Medline, CINAHL and Institute for Scientific Information (ISI), 1990–2002) restricted to English language and adult population. Search terms combined "osteoarthritis" and "arthritis" with "hand" and ["function" or "disability" or "outcome"]. Instruments used in the evaluation of HOA were identified following application of strict eligibility criteria. The use of these tools in HOA was rated by pairs of independent reviewers according to criteria developed by the Medical Outcomes Trust.

Results: The initial search yielded a list of articles which were not mutually exclusive (ISI, 127; Medline, 64; CINAHL, 61). Full journal articles were ordered from relevant abstracts (ISI, 28; Medline, 3; CINAHL, 5). Further hand searching of articles produced an additional 34 references. A total of 61 references were identified, 18 measurement tools, 5 of which met the inclusion criteria [Algofunctional Index (FIHOA), Arthritis Impact Measurement Scale 2 (AIMS2), Stanford Health Assessment Questionnaire (HAQ), Australian/Canadian Osteoarthritis Hand Index (AUSCAN), Cochin]. Overall, the AIMS2 and AUSCAN were more highly rated than the FIHOA, Cochin and HAQ.

Conclusions: The aim of this review was not to recommend any one instrument over another but to provide an overall summary of the robustness of commonly used measures. The choice of instrument will depend on many factors, and will differ from project to project depending on the question asked.

Key words: Systematic review, Hand osteoarthritis, Disability measures.

Introduction

Osteoarthritis (OA) is common in older people and often affects the hip, knee and hand[1]. It is a cause of pain, stiffness and disability, and limits activities of daily life[2]. The impact of arthritis can be measured within dimensions as defined by the WHO ICF[3], disability (activity limitation) being frequently measured because of its importance to patients and the lack of measures of participation (formerly handicap). An overview of measurement of health status in arthritis patients carried out in 1993 by Jacobs *et al.*[4] listed 12 arthritis specific measures and assessed three dimensions of health: function, psychosocial and social. The two most commonly used instruments were the Stanford Health Assessment Questionnaire (HAQ) and the Arthritis Impact Measurement Scales (AIMS). The AIMS covered all three dimensions, the HAQ two (function and social).

There have been few community studies of the extent of disability caused by symptomatic hand OA (HOA) in older people[5], although the effects of limitation on quality of activities of daily living (ADL) may be considerable[6]. Population studies of hip and knee OA use disease and region-specific measures to evaluate pain and disability, e.g., Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)[7,8]. However, no such widely accepted measure is recognised in HOA. The advantage of having a common measure in population studies is that it allows for comparability of data across populations.

In order to develop a hand assessment questionnaire for a population survey, a systematic review was undertaken of measures of hand disability. The purpose of this review was to identify current valid measures to evaluate HOA in the general population and primary care and to perform a quality appraisal of such instruments.

Methods

A three-stage strategy was used. Stage 1 involved identifying relevant articles using a systematic search (where more than one article might identify a particular

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instrument). Stage 2 identified eligible instruments from the articles in stage 1 for inclusion in the critical review. Stage 3 applied established review criteria to these instruments.

STAGE 1: SELECTING THE PAPERS

Search strategy

A systematic search strategy was developed. Publications were retrieved by an online electronic search of databases (Medline, CINAHL and Institute for Scientific Information (ISI), 1990–2002) in the English language and adult population. All papers published until December 2002 were eligible for inclusion in the review. Search terms combined: "osteoarthritis" and "arthritis" with "hand" and ["function" or "disability" or "outcome"]. The initial search yielded the following articles from the respective databases: ISI (127), Medline (64) and CINAHL (61). Selection criteria (see below) were applied to these abstracts and full papers were retrieved if the abstract provided insufficient information to enable selection. From abstracts and application of inclusion and exclusion criteria, full journal articles were ordered (ISI, 28; Medline, 3; CINAHL, 5) (ISI: Refs.[1,9–35], Medline: Refs.[36–38], CINAHL: Refs.[39–43]). References of all identified articles were hand searched for additional potentially relevant publications which produced an additional 30 articles plus 4 abstracts (articles: Refs.[4,44–72], abstracts: Refs.[73–76]).

Selection criteria

Articles were included in stage 1 if the following conditions were met: published studies encompassing patient assessed evaluation of functional disability in populations with HOA (1990–2002) or published articles referring to development or testing of patient assessed measures of functional disability applied in HOA (1990–2002). Exclusion criteria for stage 1 were: articles not specific to the evaluation of patient assessed hand disability in OA; non-English language articles; development, testing or use of laboratory radiographic and imaging techniques or objective measures of hand disability; articles which did not describe the instrument in sufficient detail; non-published data; narrative reviews; single item measures; and generic measurement tools.

STAGE 2: SELECTING THE INSTRUMENTS

Quality assessment

In order to confirm eligibility of disability measures, inclusion and exclusion criteria were applied to the identified instruments. This necessitated a further database search by named instrument. The inclusion criteria for stage 2 were: the tool was a published (anglicised) patient assessed functional disability measure and had been applied in the evaluation of HOA. Exclusion criteria for stage 2 were: an instrument used only in relation to other hand conditions, e.g., carpal tunnel syndrome or other types of arthritis such as rheumatoid arthritis (RA); assessment based on objective measures of hand disability (laboratory, radiographic and imaging techniques); instruments not clearly identified in published texts; instruments not described in sufficient detail to allow quality assessments[77]; measures not evaluating patient assessed hand disability in OA; instruments only used in auditing outcome following surgery or trauma; non-English language articles.

STAGE 3: ASSESSING THE INSTRUMENTS

Review criteria

Systematic reviewing of outcome measures has been performed previously, for example in the area of adult critical care[78]. However, the criteria for systematically reviewing outcome measurements are not as well developed as those used for randomised controlled trials (RCTs). To evaluate how valid, reliable and appropriate the disability measures defined by the systematic search were, we adopted the review criteria used by Coons *et al.*[77], published by Lohr *et al.*[79], and developed by the Scientific Advisory Committee of the Medical Outcomes Trust. The review criteria (Appendix 1) consisted of: conceptual and measurement model; reliability; validity; respondent and administrative burden; alternate forms; and cultural and language adaptations. For the purpose of this review, which was to identify measures for general population surveys, we additionally considered if the measurement tool was self-administered, if it had been used previously in populations with HOA, and whether the tool was a relevant measure for population-based studies. The review also evaluated each instrument according to the Outcome Measures in Rheumatology (OMERACT) group filter for outcome measures[80]. The review did not seek to assess if a particular instrument had been used as a primary outcome measure in RCTs, but its use in trials was reported if identified. Each instrument was reviewed by two out of the three reviewers, working independently of each other. KD reviewed all papers with ET or EMH acting as the second reviewer. Agreement was achieved through consensus meetings. For each criterion reviewed, the adequacy of supporting evidence was rated as extensive (+++), adequate (++), limited (+), none (0) and unknown (?).

Results

STAGE 1

A total of 61 references were used to identify the measurement tools. Following the application of the stage 1 inclusion/exclusion criteria to these articles, 18 measurement tools were identified: the Michigan Hand Outcomes Questionnaire (MHOQ)[15,16], the Disabilities of the Arm Shoulder and Hand (DASH)[32,45,49,50,70], the Arthritis Impact Measurement Scales 1 and 2 (AIMS1/AIMS2)[62], the HAQ[72], the Algofunctional Index (FIHOA)[20,21,31], the Disability Schedule of Function (DSF)[42], the Upper Extremity Function Scale (UEFS)[38,65], the Brigham and Women's Hospitals' Carpal Tunnel Questionnaire (BWH CTQ)[9,10,53], the ADL and visual analogue scale (VAS) Quality of Life Hand questionnaire (ADL/VAS QOL Hand Q)[17], the Australian/Canadian Osteoarthritis Hand Index (AUSCAN)[12,13,29,74], the Musculoskeletal Functional Assessment Questionnaire (MFAQ)[46,57,58,69], the Instrument of Activities of Daily Living (IADL)[63], the Cochin scale[22,33], the Ghent functional index[31,71], the Hand Clinic Questionnaire (HCQ)[68], the Patient Evaluation Measure (PEM)[56,68], the Hand Outcome Survey Sheet (HOSS)[68] and the Hand Injury Severity Scoring System (HISS)[44,68].

STAGE 2

Following a further database search and application of the stage 2 inclusion/exclusion criteria five instruments were eligible for the critical review: the HAQ[72], AIMS[62],