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Original article

The learning curve of nurses for the assessment of swollen and tender joints in rheumatoid arthritis

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ABSTRACT

Objectives: In rheumatoid arthritis (RA), nurses are now increasingly involved in joint count assessment but training is not standardized. The aim was to evaluate and describe the learning curve of nurses for the assessment of swollen and tender joints in RA.
Method: Twenty nurses from university rheumatology centres inexperienced with joint counts were allocated to a rheumatologist from their centre (teacher). Acquisition of skills consisted of Phase 1: (training), a centralized 4 hour training session, with (a) lecture and demonstration, and (b) practical sessions on patients with their teachers, followed by Phase 2: (practice) involving further practice on 20 patients in their own hospitals. Primary outcome was achievement of adequate swollen joint agreement between nurse and their teacher ("gold standard") at the "joint" level defined by prevalence adjusted biased adjusted kappa (PABAK) > 0.60. Agreement at the "patient" level of swollen joint count (SJC), tender joint count (TJC) as well as DAS28 between nurse and their teacher were assessed with intra-class correlation coefficients (ICC).
Results: During the training phase, 75% of nurses achieved a swollen joint PABAK > 0.60 when compared with their teachers, which further improved to 89% after the 20 practice patients (Phase 2). Median swollen joint PABAK improved from 0.64 (Q1:Q3 0.55,0.86) to 0.83 (Q1:Q3 0.77,1) by the end of Phase 2. At the "patient" level, SJC agreement remained globally stable (ICC, 0.52 to 0.66), while TJC and DAS28 agreement remained excellent throughout.
Conclusion: Nurses inexperienced in joint counts were able to achieve excellent agreement with their teachers in assessment of tender and swollen joints through a short training session; practice further enhanced this agreement. Larger longitudinal studies are required to assess skills retention.

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1. Introduction

Rheumatoid arthritis (RA) is a chronic inflammatory disease predominantly affecting the joints with synovitis as the hallmark. Detection of synovitis with regular assessment of disease activity and tight control are the over-arching principles of treating-to-target, leading to reduced radiographic damage and disability [1,2].

One problem with RA is there is no one single clinical or laboratory measure that can measure disease activity effectively [3]. However, joint counts (tender and swollen joints) are still regarded by most physicians as a feasible gold standard in clinical disease activity assessment [4]. Its importance is highlighted in its inclusion in the core data set of variables such as in clinical trials in RA [5] and common disease activity indices such as the original disease activity score [6], modified disease activity score of 28 joints (DAS28) [7] and Simplified Disease Activity Index (SDAI) [8] for example, as well as various remission criteria [9–11]. Although not all physicians perform joint counts, and there are other parameters such as patient global level of health and acute phase reactants, being able to assess for tender and swollen joints remain an important core skill to acquire in clinical practice. Nurses and even more recently, patients themselves have also participated in assessment of tender and swollen joints to assist the physician in management of RA. It is therefore of interest that nurses who are directly involved in the care of patients with RA are able to learn how to perform joint counts and also able to teach others such as patients themselves to assess for tender and swollen joints.

Nurses play an important part in the management of complex chronic illnesses such as RA, and act as the "interface" between patients and other members of the multidisciplinary team [12–14]. The European League Against Rheumatism (EULAR) working group on the role of rheumatology nurses [13] recently highlighted that nurses may be able to assist the physician in the comprehensive disease management of chronic inflammatory arthritis, such as monitoring and control of disease activity, as well as patient education about disease activity and monitoring of RA related co-morbidities. In whatever level of responsibility the nurse would take on, it would be useful for nurses to be proficient at joint examinations [13] so that they will be better equipped to educate patients regarding the importance of regular disease assessments and potentially self-assessment of joints in the future. To date there has been no data on the training and learning curve of nurses to joint count.

One problem associated with joint count assessment is the potential inter-observer variation [15,17]. Inter-observer variation is present, even among clinicians, particularly in the assessment of swollen joints [15–20]. Proper training or standardization may reduce this variation [17–21]. Although it would be ideal for the same rheumatologist to perform joint counts on the same patient to achieve treating-to-target, it would be potentially advantageous for a clinic nurse in university based practices or even large combined private practices to assist with structured disease activity assessments between formal clinician consultations. In order to achieve this, it is important to obtain a satisfactory level of agreement between the rheumatologist and nurse in the assessment of swollen and tender joints. However, it is unclear how many practice patients are needed or which type of training is required in order for nurses to be considered proficient at assessing tender and swollen joints. To date, there has been no formal evaluation of nurses on learning how to assess for disease activity in RA [13].

The objective of the present study was to evaluate and describe the learning curve of nurses to evaluate for swollen and tender joints with the rheumatologist as the "gold standard".

2. Method

2.1. Participants

Nurses from Rheumatology university centres around France without previous experience in joint count assessment were invited to participate, provided they had a teacher from their rheumatology centre available for the entire study. The training session was part of the initial preparation for the COMorbidities and Education in Rheumatoid Arthritis, COMEDRA (COMEDRA, NCT01315652) trial, a multicentre randomized study involving 18 rheumatology centres in France (Fig. S1; see the supplementary material associated with this article online), evaluating the impact of nurse-led co-morbidity monitoring and impact of a nurse-led education program aimed at educating RA patients to self-assess their disease activity through performing a TJC and SJC followed by a calculation of their DAS28. In order to achieve this, it was necessary to teach and train nurses how to satisfactorily perform a tender and swollen joint count, and subsequently calculate a DAS28 so that they can teach patients how to perform this.

2.2. Study design

The education of joint counts was divided into two parts: Phase 1 (training) and Phase 2 (practice). The basic principles included initial information and objective dissemination, demonstration, practice and subsequently, consolidation of the learning with feedback. To minimise inter-observer variation, the teacher was the same rheumatologist in both Phase 1 and 2.

2.2.1. Phase 1 (training)

Phase 1 consisted of a half-day training session in Paris, January 2011. Training objectives and format of the sessions and teaching was outlined to the participants and teachers the day before. Information on clinical examination was prepared based on the EULAR handbook of disease assessments in RA [22] and was distributed to the participants in booklet form, and in video (http://www.rhumatismes.net). Participants had the opportunity to go through the material prior to the training.

The format of the training session was as follows: participants received a (i) 30 minute group demonstration on how to perform joint counts on a patient, and (ii) a 30 minute lecture on how to evaluate for tender and swollen joints and calculation of composite disease scores such as a DAS28. Due to the size of the group, half the participants started with the group demonstration while half started with the lecture. After the first 30-minute lecture/demonstration, nurses were paired with a rheumatologist from their rheumatology centre who would be their teacher for the entire duration of the study. During the training day, the teachers had also participated in an agreement consensus exercise as calibration [21]. In this section, rheumatologists were disseminated with material on joint counts based on the EULAR handbook of assessments, followed by three rounds of small group consensus exercises, with the achievement of median swollen joint PABAK of 0.71 (Q1:Q3, 0.57, 0.79). Nurse-teacher pairs, in small groups, then went through a series of six exercises examining RA patients with various levels of disease activity (Table S1; see the supplementary material associated with this article online). Individually, each participant, blinded to other nurses and teachers, performed tender and swollen joint assessment of 28 joints (two wrists, ten metacarpophalangeal, ten proximal interphalangeal joints, two elbows, two shoulders and two knees), followed by their teacher on a RA patient at each exercise. Results were recorded and not discussed until everyone in the group had finished their examinations. Joints with discordant results were re-examined to reach a consensus, with particular emphasis on swollen joints. Each exercise lasted for at