Development of a guideline for the use of ultrasonography in rheumatoid arthritis: Preliminary recommendations

Développement d'un guide pratique pour l'utilisation de l'échographie dans la polyarthrite rhumatoïde: Recommandations préliminaires

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Abstract

Aim: To address the protocol of recommendations for the use of ultrasonography (US) in the management of rheumatoid arthritis (RA) in routine practice.
Methods: The present study is a protocol design for practical guidelines. Based on a systematic literature review, the scientific committee (composed of 6 experts on US) decided on key questions which will be used to develop recommendations. These recommendations will be submitted to a group of experts in US in rheumatic and musculoskeletal diseases using the Delphi method. This step will lead to preliminary recommendations. The next step will be to submit the preliminary guideline to an expanded group of US experts to check their relevance. The level of agreement of the experts will be recorded during a web-based meeting.
Results: Following two rounds of the Delphi method, a consensus will be addressed. The latter will i) Highlight the use of US for the diagnosis of RA in an early stage of the disease; ii) Define the role of US during follow-up; and iii) Underline the importance of US for the management of clinical remission.
Conclusion: These recommendations will harmonize and optimize clinical practice and management of RA patients.

Key words: Diagnostic Imaging; Practice Guidelines; Rheumatic disease

Résumé

Objectif: Décrire le protocole d'élaboration des recommandations pour l'utilisation de l'échographie dans la prise en charge de la polyarthrite rhumatoïde (PR) en pratique courante.
Méthodes: Il s'agit d'un protocole de recommandations de bonnes pratiques. Suite à une revue systématique de la littérature, un comité scientifique de 6 experts en échographie a identifié les questions clés qui seront utilisées pour l'élaboration des recommandations. Ces recommandations seront par la suite soumises à une validation par un groupe d'experts en échographie ostéo-articulaire en utilisant la méthode Delphi. Cette première étape débouchera sur des recommandations préliminaires. Par la suite, les recommandations préliminaires seront soumises lors d'une réunion présentielle en ligne à un groupe élargi d'experts en échographie osté-articulaire pour vérifier leur pertinence. Le niveau d'accord des experts sera enregistré.
Résultats: Suite aux deux tours Delphi, le consensus portera sur i) L'utilisation de l'échographie pour le diagnostic positif de la PR à un stade précoce, ii) La surveillance de l'activité de la PR; et iii) La gestion de la rémission.
Conclusion: Ces recommandations visent à harmoniser et optimiser la pratique clinique et la prise en charge des patients atteints de PR.

Mots clés: Imagerie, recommandations, rhumatisme inflammatoire chronique

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INTRODUCTION

Rheumatoid arthritis (RA) is the most frequent chronic articular disease, involving mainly the small joints of hands and feet [1]. In the absence of adequate treatment, RA may lead to irreversible disability and even to premature death [2]. In order to monitor disease activity and progression, several outcome measures and tools have been developed [3]. One of the most important predisposing factors for subsequent joint damage has been recognized as the presence of persistent active synovitis [4].

However, active synovitis are not always detected by clinical examination [5]. In such cases, physician will not optimize the disease modifying therapy, which will lead to slowly and silently bone erosions, cartilage damage and tendon tear. In that context, the osteoarticular ultrasonography (US) seems to be an interesting tool as it allows an assessment of active synovitis, tenosynovitis and erosions [6]. Definition of elementary US lesions are well established since several years [7]. Scoring systems to quantify the importance and the activity of inflammatory lesions are also codified and the most used one is the semi-quantitative score of EULAR (European League of Rheumatology) [8]. However, the practical use of the US (eg; material to use, joints to assess at diagnosis or follow-up, frequency of assessment, the written medical report) are not clearly mentioned in previous literature. The French society of rheumatology has published in 2019 a practical guideline for the use of US in RA [9]. As US is constantly evolving, new data is available this past five years.

Thus, the aim of this paper was to describe the protocol of the most up-to-date practical use of US for the diagnosis and the follow-up of RA.

METHODS

The present study is a protocol design for a practical guideline. The development of this guideline involved a steering committee (SC) composed of six rheumatologists experienced in musculoskeletal ultrasonography (KBA, HA, SS, AH, RB, AE in the authors' list). The general organization of the procedure for elaboration of the recommendations is illustrated in Figure 1.

Definition of questions within each theme by the steering committee

At the initial task force meeting, members of the SC raised clinically relevant questions related to key aspects of the use of US in RA. The research questions were agreed by consensus and five final research questions were selected, which encompassed the following topics:

i) Overarching principles: The role of US in the management of RA, which probes and equipment to use, which imaging modalities (B mode, Doppler mode) to recommend, which definition of inflammatory and structural lesions to adopt?

ii) Definition of the sites to be examined: Where to assess inflammatory (synovitis, tenosynovitis) and structural (erosions) lesions?

iii) Diagnosis: What is the value of US in the diagnosis of inflammatory arthralgia, early arthritis and early RA?

iv) Follow-up and therapeutic response: What is the value of US in the follow-up and evaluation of the response to RA treatment?

v) Remission: What is the value of US in the management of RA remission?

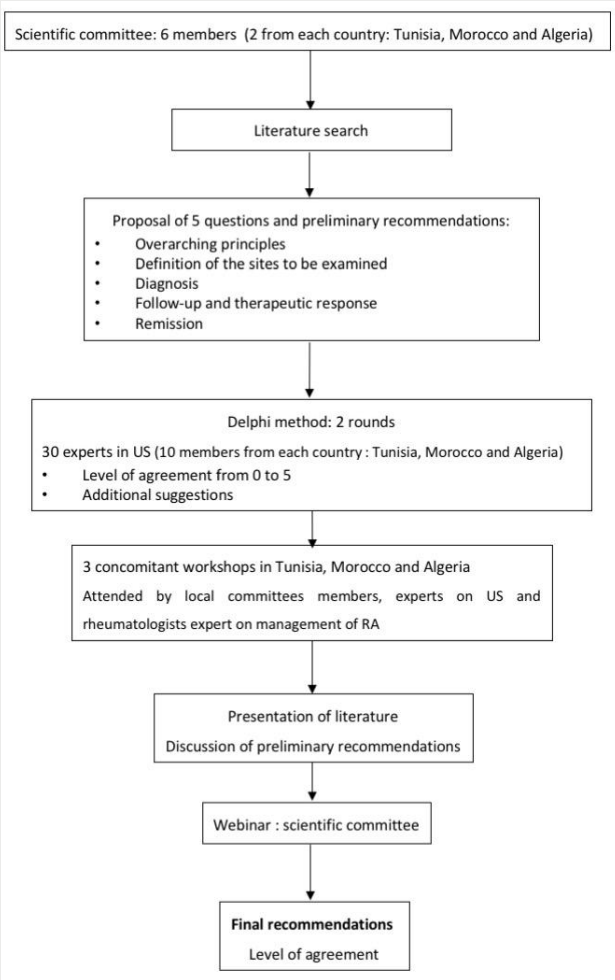

Figure1. General organization of the development of US recommendations in RA

US: Ultrasonography, RA: Rheumatoid arthritis

Systematic review of the literature

A systematic search for articles was performed during a face-to-face session of the SC. During this session, some databases such as PubMed/Medline, Embase and Cochrane were assessed using the combination of the following Medical Subheading terms: (Rheumatoid arthritis) AND (ultrasonography OR ultrasonography, Doppler OR ultrasonics). The following inclusion criteria of studies selected were: Adult population, publications in English or French and no date limit. The articles selected were classified according to the three major topics: i) Overarching principles, ii) Diagnosis; and iii) Follow-up and remission. Every two members of the SC handled a topic and had for mission to deeply analyze literature and select relevant articles. Later on, an online meeting was scheduled where every team exposed the results of the systematic literature search and preliminary recommendations were developed and written.

Validation of the recommendation according to the Delphi process

This step will follow the previous one of elaboration of preliminary recommendations. A two-round Delphi consensus [10] will be conducted through a GoogleForm® questionnaire, which will be dispatched by email to an expert group of 30 rheumatologists experienced in musculoskeletal ultrasonography. The rheumatologists that will be selected will have a minimal number of 5 years of regular US practice (ie; 10 rheumatologists from each country: Tunisia, Morocco and Algeria). The questionnaire

will be sent in the French language.
The 30 rheumatologists will be asked to respond within two weeks. A reminder email will be posted to non-responders after one week. The rheumatologists will have to rate their level of agreement for each item using a Likert scale ranging from 0 (totally disagree) to 5 (totally agree). Additional free spaces will be reserved for additional suggestions at the end of each section.
An agreement will be considered if more than 75% of rheumatologists attribute a level of agreement greater than 3, and the item will be included in the recommendations from the first round. A disagreement will be considered if more than 75% of participants rate a level of agreement less than 2, and the item will be definitely excluded. If the statement will not respond to one or another of the cited situations above, it will be included into the second round of the survey.
The second questionnaire will be sent two weeks after starting the Delphi process. After one week, a reminder email will be also issued to non-responders. The statements rated more than 3 by more than 75% of participants will be retained in the recommendations.

Experts' opinion and elaboration of the final recommendations
The recommendations validated by the Delphi process will be presented in three concomitant workshops in Tunisia, Morocco and Algeria. In each country, the workshop will be attended by local members of the SC, the panel of 30 experts who participated at the Delphi process (10 members from each country), as well as rheumatologists with expertise in the management of RA, whether they performed US or not. The objective of these workshops will be to assess the relevance, exhaustiveness and comprehensibility of the proposed recommendations. The literature review, which allowed the elaboration of the preliminary recommendations will be presented and then the recommendations will be discussed in each workshop.

Validation of the final recommendations
Following the three workshops, a webinar including the members of the SC will be organized to report experts' opinions and comments. When the suggestions from each session will be agreed, a single wording will be retained. Otherwise, the wording proposals from each workshop will be discussed. Then, the degree of agreement for the final wording of each recommendation will be evaluated on a Likert scale graduated from 0 (totally disagree) to 5 (totally agree) by a vote.

DISCUSSION

US standardization, considering the particularities of each affected joint or tendon by RA, is certainly a requirement. Indeed, over the last two decades (ie; 2003-2023), a growing number of studies have been published aiming at investigating the role of US in the diagnosis and follow-up of patients with RA [11-13].
In RA, US is helpful to detect early synovitis and is also sensitive in the identification of bone erosions [14,15]. Although numerous studies are published in that field, scores to use and sites to assess are not yet consensual and are yet pending issues. Besides, US is an imaging modality relatively easy to set up in a clinic practice, but it is often regarded as being operator dependent with associated reproducibility issues [16,17]. Its reliability is variable among studies and have still to be improved. Quality of US devices and probes is also surely an item of major importance [18]. Choice of equipment and selection of parameters to be used are also pending issues. To resolve these controversies, the first solution may be the implementation of US courses for a large number of rheumatologists and improving training will enhance competency of sonographers and therefore US reliability. The second solution may be a consensual use of US according to different situations when treating RA (ie; diagnosis, follow-up, and remission). As number of points regarding employment of US in rheumatological daily practice need to be elucidated, these recommendations may guide ultrasonographers in daily practice.

CONCLUSION

US is a quick and safe tool useful to complement the physical examination of RA patients. Adequate and guided use of this imaging modality help rheumatologists not only for diagnosing RA, but also during follow-up and for the management of remission.

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