



ELSEVIER

Contents lists available at ScienceDirect

# Best Practice & Research Clinical Rheumatology

journal homepage: [www.elsevierhealth.com/berh](http://www.elsevierhealth.com/berh)



10

## Musculoskeletal interventional procedures: With or without imaging guidance?



David Kane<sup>a,\*</sup>, Juhani Koski<sup>b</sup>

<sup>a</sup> Department of Rheumatology, Trinity College Dublin, Ireland

<sup>b</sup> Mikkeli Central Hospital, Porrassalmenkatu 35-37, 50100 Mikkeli, Finland

### Keywords:

Intra-articular injection  
Ultrasound guided  
Musculoskeletal  
Procedural  
Efficacy

### A B S T R A C T

Aspiration and injection of joints and soft tissues is an indispensable skill used in everyday practice by the clinical rheumatologist. Most rheumatologists recognise that performing these procedures using anatomical landmarks is not always successful, particularly in the case of small or infrequently injected joints, bursae or tendon sheaths. Musculoskeletal ultrasound confirms the local pathological-anatomical diagnosis and is the most applicable and feasible imaging method that can be applied in clinical practice in guiding musculoskeletal interventional procedures. From 1993, there has been substantial examination of the accuracy of landmark- and imaging-guided procedures. We have searched the literature and ascertained whether imaging techniques improve the accuracy of musculoskeletal procedures and whether the accuracy of needle placement can be translated into improved clinical outcome (efficacy).

© 2016 Elsevier Ltd. All rights reserved.

### Introduction

Despite major advances in systemic therapy for the treatment of inflammatory rheumatic diseases, corticosteroid (steroid) injection into the joints, bursae, tendon sheaths or other musculoskeletal soft tissues remains an important tool used in daily clinical practice. These injections are usually guided by the palpation of anatomical landmarks and are termed landmark-guided injection (LMGI) (also known

\* Corresponding author. Tel.: +353 14142889.  
E-mail address: [david.kane@amnch.ie](mailto:david.kane@amnch.ie) (D. Kane).

as palpation-guided, clinical examination-guided or blind injection techniques). Jones et al., in 1993 were the first to report the success rates of needle placement using a palpation-guided approach [1]. The authors proposed that accurate placement of the needle could diminish the discomfort experienced by the patient and reduce incidental damage to adjacent structures and tissue atrophy within the extra-articular soft tissues.

Ultrasound (US) guidance of aspiration was first reported by Gompels and Darlington in 1981 [2]. The first step of an US-guided procedure is always to confirm and localise the joint or soft tissue pathology. In clinical practice, US has been shown to frequently change the anatomical and pathological diagnosis made on clinical grounds, which alters the decision of whether or not to inject and where to place the needle [3]. The superior diagnostic accuracy of US scanning compared with clinical examination is a major factor that should be examined in future studies that compare the outcomes of LMGI and US-guided injections (USGIs). In addition to aspiration and steroid injections, it is now possible to perform US-guided percutaneous biopsies of the joints, bursae, tendon sheaths, major salivary glands and muscles; to assist insertion of drainage catheters; to detect soft tissue foreign bodies; and to perform nerve blocks. There are two common methods for USGIs: semi-guided or indirect method (skin surface marking) and needle guidance under direct sonographic vision (direct method) [4,5]. Direct visualisation of the needle is considered to be the superior technique because it confirms the correct position of the needle. The needle is observed in real time while it is passing through the tissue. There are no studies that directly compare the performance of these two USGI techniques.

US is the optimal imaging modality for guiding musculoskeletal interventional procedures because it is extensively available at bed side, provides high definition imaging of both needle and joint tissues, incurs relatively low costs and does not use radiation [6]. In this article, we address whether USGIs improve the accuracy of therapeutic musculoskeletal injections compared with LMGI and, further, the accuracy of needle placement can be translated into improved clinical outcome (efficacy) in the different anatomical regions. We searched all English language articles published in the last 35 years using PubMed database and collected clinical trials comparing the accuracy and/or efficacy of LMGI with USGIs. We focused on human rheumatic and musculoskeletal conditions and excluded oncology, traumatology and spinal procedures.

## Shoulder

### *Glenohumeral joint*

#### *Accuracy*

In a study by Cunningham et al., injections of steroid and contrast agent were given in 184 different joints randomised for LMGI and USGI. The accuracy was assessed by radiography of the injected joint, which localised the contrast agent in the injectate. The accuracy of the glenohumeral joint injections reported for USGI was 63% and for LMGI was 40% ( $p = NS$ ) [7]. It should be noted that in this study, USGI was performed using the posterior approach by a relatively inexperienced ultrasonographer with one year of practical US experience, and 40% accuracy was achieved by rheumatologists with a median of 14 years of clinical experience in joint injection. It would be expected that the accuracy of a skilled ultrasonographer interventionist would be much higher, and the sample size in this study was small making statistical analysis difficult.

There are eight clinical studies that investigated the use of LMGI. Three of these used magnetic resonance (MR) arthrography for accurate injection verification, four used contrast medium and fluoroscopy and one used arthroscopy. According to these reports, the mean accuracy of LMGI to the glenohumeral joint was 67% (variation 10–99%) [1,8–14]. In a paper by Tobola et al. [13], three different injection approaches were investigated (anterior, posterior or supraclavicular), and statistically significant differences were absent between the three approaches. However, the anterior route was the most accurate and was independent of the experience level of the provider.

There are five other studies that have investigated the accuracy of USGI before MR arthrography [15–19]. The mean reported accuracy of USGI to the glenohumeral joint were 96% (variation 92–100%). One of these studies compared US- and fluoroscopy-guided techniques and noted that the

Download English Version:

<https://daneshyari.com/en/article/5665522>

Download Persian Version:

<https://daneshyari.com/article/5665522>

[Daneshyari.com](https://daneshyari.com)