

Editorial

Ultrasound-guided corticosteroid injection in rheumatology: accuracy or efficacy?

Is it the best way to deliver corticosteroid injections?

This editorial refers to ‘Steroid injection for hip osteoarthritis—efficacy under ultrasound guidance’, by Mihaela C. Micu *et al.*, doi:10.1093/rheumatology/keq030, on page 1490 and ‘Ultrasound-guided sacroiliac joint injection in patients with established sacroiliitis: precise IA injection verified by MRI scanning does not predict clinical outcome’, by Wolfgang Hartung *et al.*, doi:10.1093/rheumatology/kep424, on page 1479.

Two articles by Micu *et al.* [1] and Hartung *et al.* [2] in this issue are interesting because they describe the short-term efficacy of corticosteroid injection performed with ultrasound (US) guidance for hip OA and sacroiliitis, respectively. In the first study, on hip OA [1], 100% of patients received correct IA needle placement and showed significant clinical improvement compared with the controls who did not receive the steroid injection. In the other study on US-guided injections in sacroiliac joints in patients with sacroiliitis [2], only 40% of the procedures reached the synovial space when verified by MRI. While this accuracy rate was lower than previously published studies (which ranged from 80 [3] to 93.5% [4]), this study interestingly reported no significant difference in clinical improvement whether steroid was delivered into the SI synovial space or merely the posterior periarticular area of the SI joint. Clearly, more studies are needed to provide evidence about short- and long-term benefit and cost effectiveness of therapeutic US-guided injections vs blinded injections.

When expert clinicians deliver IA injections, they normally do not need guidance from imaging techniques to place the needle successfully in the target area. However, some studies report variable accuracy in placement of the needle in palpation-guided IA injections [5, 6]. To locate the exact needle position in ‘blind’ injections is, of course, difficult in deep joints (e.g. hip, SI or glenohumeral joints). This fact might be clinically crucial for diagnostic IA aspiration or when accurate IA medication injection is necessary (e.g. radioisotopes and viscosupplementation). In addition, in conventional ‘blind’ routes, the risk of incidental damage to the adjacent non-target structures by the needle or injected drug, or from both, cannot be avoided completely. These structures include, depending on the

injected region, blood vessels, peripheral nerves, muscles, ligaments, intratendinous tissue and subcutaneous fat.

Ultrasound is a valuable bedside tool for guiding accurate and safe musculoskeletal fluid aspiration and injections [7]. Moreover, it confirms the clinical diagnosis and the indication for injection. Real-time ultrasound enables the rheumatologist to correctly place the needle, accurately deliver medication and visualize the steroid suspension during and after the procedure. Epis *et al.* [7] have described the accuracy, safety and simplicity of US for guiding interventional procedures in the musculoskeletal system. US-guided injections performed by clinicians are as feasible as blind procedures in clinical practice. However, there is a learning time for the correct use of US-guided injections and the success of the technique is operator dependent [3, 4, 8]. In particular, US-guided injections of deep anatomical targets require more experience than superficial injections. The oblique direction of the needle to the ultrasound beam in deep injections decreases its visibility during these procedures. After appropriate training, however, US guidance is suitable for deep joints such as the hip and SI joints, and is successful and effective [3, 9].

The effect of accurate needle placement in a therapeutic response to local corticosteroid injection reported in the literature needs further elucidation [2, 10]. Various arguments can explain this controversy. The mechanism of local steroid action is not well understood. Both a systemic effect and a local action by diffusion of the steroid suspension either into blood vessels or the surrounding anatomic structures could explain their therapeutic effect, even when they do not reach the target tissue. Nevertheless, a recent randomized controlled study by Sibbitt *et al.* [10] on 148 painful joints clearly showed that US guidance significantly improved the performance and short-term outcome of IA steroid injections compared with conventional palpation guidance. In conclusion, we believe that US guidance can maximize injection accuracy in the intended target area and minimize adverse effects.

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