

Larger Study in Design

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tion of at least one joint.

Half of the cohort (50%, 29) had RA, with 48% (14) having detectable anti-citrullinated peptide antibodies. Sixteen (28%) patients had resolving arthritis, which was mostly unclassified, and 13 (22%) patients had persistent conditions other than RA. The non-RA group in-

cluded five patients with psoriatic arthritis, one with reactive arthritis, and two with systemic lupus erythematosus. Disease could not be classified in 5 patients. Patients were examined 24 hours before having US, and followed up prospectively for 18 months. Baseline and follow-up clinical assessments included: 68 tender and 66 swollen joint counts; 28-joint disease activity score; serological data; and conventional radiography of the hands and feet. An ultrasonographer, who was unaware of the clinical findings, systematically assessed a total of 50 joints using four-point semi-quantitative scales to note the presence of erosions.

Musculoskeletal US detected significantly more joint involvement than did clinical examination. It also detected more clinically silent involvement of the wrist, elbow, knee, ankle, and metatarsophalangeal (MTP) region. US of the wrist, metacarpophalangeal (MCP) and MTP regions were the best predictors of joint involvement, improving upon clinical predictive models for RA. In contrast, imaging of the large joints was not useful for predicting joint involvement.

The tentatively titled Ultrasound To Optimize Prediction In Arthritis (UTOPIA) study is in development, and will focus on the use of musculoskeletal US of a restricted group of joints in a large group of early arthritis patients. ■

VITALS

Major Finding: Musculoskeletal ultrasound of the wrist, and metacarpophalangeal and metatarsophalangeal regions showed the highest predictive value in very early arthritis patients.

Data Source: A prospective study of 58 patients with very early arthritis.

Disclosures: Dr. Filer had no conflicts of interest in relation to the study. The study was funded by Arthritis Research UK and the AutoCure Consortium.

Ultrasound's Usefulness Depends on Confirming Pattern of Early Changes

MY TAKE

The study provides an indication that systematic evaluation of joints by ultrasound in patients presenting with very early undifferentiated arthritis may be a useful predictor of future diagnosis of rheumatoid arthritis. Ultrasound may detect involvement in more joints than are detected on clinical examination, and it may detect early erosions with greater sensitivity than conventional radiography. Especially in patients who do not have anti-citrullinated peptide antibodies, the presence of polyarthritis and erosions on ultrasound appears to herald an eventual diagnosis of RA even when patients who do not appear to have polyarthritis on clinical examination.

This approach has promise, but examination of 50 joints is not likely to be efficiently done or reimbursable in routine clinical practice. Further work may yield a profile of specific target joints that may have highest

sensitivity and predictability for eventual development of RA when examined by ultrasound, or whether all joints would need to be evaluated. Studies of conventional radiography have failed to reveal a consistent pattern or joints that could be consistently excluded. Magnetic resonance imaging studies of the hands have suggested that involvement of specific joints in the wrists, for example, might best discriminate the eventual diagnosis of RA early in the disease course. Such studies are needed to better define the role of ultrasound in assessment of patients with early undifferentiated inflammatory arthritis and the role of diagnostic ultrasonography in routine clinical practice.



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Rheumatologists Learning US; Studies Show Diagnostic Usefulness

BY M. ALEXANDER OTTO

EXPERT ANALYSIS FROM A
RHEUMATOLOGY SEMINAR SPONSORED
BY UCLA

MARINA DEL REY, CALIF. — Thinking about learning ultrasound? You are not alone, according to Dr. Kambiz Motamedi of the radiology department at the University of California, Los Angeles.

In Europe, rheumatologists have been using ultrasound (US) in their offices for years. The use of diagnostic US is catching on among U.S. rheumatologists, too. The American College of Rheumatology is offering its first US course this summer.

Studies, mostly done overseas, suggest its diagnostic value (Rheumatology 2009;48:1,092-7).

Uptake has been slower in the United States because MRI is more readily available and US has a steep learning curve, Dr. Motamedi said during a presentation and workshop on US.

But US is "becoming more and more popular," among U.S. rheumatologists, he said.

A recent, small study suggests that even self-taught rheumatologists can become proficient ultrasonographers (Arthritis Care Res. 2010;62:155-60).

US is useful to look at superficial structures, including muscles, tendons, ligaments, nerves, and blood vessels, said Dr. Mihaela Taylor of the division of rheumatology at UCLA, who collaborated with Dr. Motamedi on the presentation and workshop.

It has higher soft-tissue resolution than does CT, Dr. Motamedi noted, although CT remains the standard for visualizing bone.

US also can visualize superficial joint structures, and pick up bone erosions, Baker's cysts, fluid behind the patella, and even meniscal tears, if they are in the periphery of the meniscus, according to Dr. Motamedi.

Joints can also be seen in motion, meaning that US can help guide joint injections.

"Ultrasound can't replace all that MRI [or CT] does, but it helps diagnose a lot of pathology," Dr. Motamedi said.

Painless, noninvasive, relatively inexpensive, and free of radiation, it's also readily accepted by patients, Dr. Taylor said.

Although magnetic resonance imaging remains the standard for visualizing deep anatomical structures, such as those of the knee, US is a valid alternative, especially for claustrophobic pa-

tients and those with pacemakers or other MRI contraindications. The general concept of US is easy to grasp: Sound waves emitted from a probe are bounced off body structures. Their reflections back to the probe indicate the structure's density. Bone reflects as white. Less-dense structures—those that contain more water—reflect as darker shades.

What's closest to the probe (usually skin) appears at the top of the screen. What's farther away appears lower down.

Anything below bone cortex is artifact. Ultrasound does not penetrate bone, Dr. Taylor said.

Higher sound-wave frequencies mean better resolution but less penetration; lower frequencies penetrate more deeply but give less resolution.

It's helpful to keep the probe in motion and tilt it from side to side to help differentiate structures, Dr. Taylor said.

Information about the American College of Rheumatology's US course is at www.rheumatology.org/education/clinical-symposia/mus.asp. ■

Disclosures: Dr. Motamedi and Dr. Taylor each reported having no relevant financial conflicts.

CT Makers Unveil New Safety Feature Proposal

BY ALICIA AULT

Manufacturers of computed tomography machines have agreed to a standardized set of features that will help ensure that patients receive the appropriate radiation dose when being scanned.

In a conference call with reporters, Dave Fisher, executive director of the Medical Imaging & Technology Alliance (MITA), said that the industry had been working for years to make CT machines safer and that the timing of the announcement was not related to either the Food and Drug Administration's recent heightened interest in radiation or a recent House Energy & Commerce Health Subcommittee hearing.

The five CT manufacturers—General Electric, Siemens, Philips, Toshiba, and Hitachi—all agreed to participate in the MITA "dose check" initiative, said Mr. Fisher.

There are three new main safety features. First, machine operators will receive an on-screen alert—possibly in the form of a pop-up window—when they exceed recommended dose levels. The alert

is akin to a yellow caution flag, said Mr. Fisher. The recommended dose—the reference dose—will be determined by clinicians at hospitals and imaging centers, not manufacturers, he said.

The second safeguard will also likely come as a pop-up window: a warning if the dose reaches hazardous levels that could result in burns, hair loss, or other injuries. This "red flag" can be configured to prevent the scan, Mr. Fisher said.

Clinicians, not manufacturers, will have the power to determine whether they want to block a scan or have some other series of instructions or steps to prevent harm, he said.

Manufacturers have agreed to a standardized method of image storage so that they can be incorporated into a registry—if such a registry is developed, as the Obama administration has proposed. The new features will not likely be available until late 2010 or early 2011, Mr. Fisher said. They may come as software upgrades to older machines or add-ons to new scanners being developed now. The process may be delayed if the FDA decides that the features need regulatory clearance, he said. ■