Panel Proposes MRI Role in Knee OA Diagnosis

BY MITCHEL L. ZOLER

FROM THE WORLD CONGRESS ON OSTEOARTHRITIS

BRUSSELS – The use of magnetic resonance imaging may enable earlier recognition of knee osteoarthritis, and should be incorporated into recommended diagnostic criteria, a panel of 16 osteoarthritis experts concluded.

Using MRI to define knee osteoarthritis (OA) may allow detection of the disease before radiographic changes occur. But despite a growing body of literature on the role of MRI in OA, little uniformity exists for its diagnostic application, perhaps because of the absence of criteria for an MRI-based structural diagnosis of OA, the group said.

The Osteoarthritis Research Society International (OARSI) organized the 16-member panel, the OA Imaging Working Group, to develop an MRI-based definition of structural OA. The working group sought to identify structural changes on MRI that defined a structural diagnosis of knee OA, Dr. David J. Hunter and the other members of the working group wrote in a poster presented at the congress, which was organized by OARSI.

The working group began with a literature review through April 2009, a process that yielded 25 studies that met the group's inclusion criteria and evaluated MRI diagnostic performance. Through a multiphase process of discussion and voting, the group agreed on a set of nine propositions and two OA definitions based on MRI criteria. (See boxes.) These constitute "statements of preamble and context setting." The two definitions "offer an opportunity for formal testing against other diagnostic constructs," said Dr. Hunter of the University of Sydney and his associates in the working group.

The working group noted that the American College of Rheumatology in 1986 first released the current standard criteria for diagnosing OA, which deal only with radiographic imaging (Arthritis Rheum. 1986;29:1039-49). The European League Against Rheumatism published more current recommendations this year, but focused on a clinical diagnosis that did not involve imaging (Ann. Rheum. Dis. 2010;69:483-9).

The working group aimed to "include MRI as a means to define the disease with the intent that one may be able to identify early, pre-radiographic disease, thus enabling recruitment of study populations where structure modification (or structure maintenance) may be realistic in a more preventive manner."

The group stressed that "the propositions have been developed for structural OA, not for a clinical diagnosis, not for early OA, and not to facilitate staging of the disease."

An osteoarthritis specialist who was not involved with the working group cautioned that waiting for MRI structural changes that are specific for OA may still miss a truly early diagnosis, before irreversible pathology occurred.

"There are early changes [seen with MRI] that are not picked up on radiographs, but we don't yet have a standardized, validated definition of an earlier stage" on MRI, Dr. Tuhina Neogi, a rheumatologist at Boston University, said in an interview.

Dr. Hunter said that he has received research support from AstraZeneca, DJO Inc. (DonJoy), Eli Lilly & Co., Merck & Co., Pfizer Inc., Stryker Corp., and Wyeth. Eight of the other members of the working group also provided disclosures, whereas the remaining seven members said they had no disclosures. Dr. Neogi had no disclosures. ■

The OARSI Panel's Propositions

The following are nine propositions on MRI diagnosis of knee OA:

1. MRI changes of OA may occur in the absence of radiographic findings of OA.
2. MRI may add to the diagnosis and should be incorporated into the ACR diagnostic criteria including x-ray, clinical, and laboratory parameters.
3. MRI may be included in clinical studies according to the criteria detailed above, but should not be a primary diagnostic tool.
4. Certain MRI changes that occur in isolation are not diagnostic of OA. These include cartilage loss, change in cartilage composition, cystic change and development of bone marrow lesions, ligamentous and tendinous damage, meniscal damage, and effusion and synovitis.
5. No single finding is diagnostic of knee OA.
6. MRI findings indicative of knee OA may include abnormalities in all tissues of the joint (bone, cartilage, meniscus, synovium, ligament, and capsule).
7. Given the multiple tissue abnormalities detected by MRI in OA, diagnostic criteria are likely to involve several possible combinations of features.
8. Definite osteophyte production is indicative of OA.
9. Joint space narrowing as assessed by (nonweight-bearing) MRI cannot be used as a diagnostic criterion.

Two MRI-Based Definitions

The panel arrived at the following two definitions for MRI findings that were diagnostic of knee osteoarthritis:

1. **Tibiofemoral OA** should have either both features from group A (below), or one feature from group A and at least two features from group B. Examination of the patient must also rule out joint trauma within the last 6 months (by history) as well as inflammatory arthritis (diagnosed by radiographs, history, and laboratory findings).
   - ► Group A: Definite osteophyte formation; full thickness cartilage loss.
   - ► Group B: Subchondral marrow lesion or cyst not associated with meniscal or ligamentous attachments; meniscal subluxation, maceration, or degenerative (horizontal) tear; partial-thickness cartilage loss (without full thickness loss).
2. **Patellofemoral OA** requires the following features involving the patella or the anterior femur:
   - ► Definite osteophyte formation.
   - ► Partial- or full-thickness cartilage loss.

Anti-Inflammatory Injections May Help Heal Knee Trauma

BY MITCHEL L. ZOLER

FROM THE WORLD CONGRESS ON OSTEOARTHRITIS

BRUSSELS – The clinical response seen to injection of a targeted anti-inflammatory drug into an acutely damaged knee joint within a few weeks of injury in a controlled pilot study with 11 patients provided a step toward the development of a new approach to treating traumatic joint injury.

VITALS

Major Finding: A single, 150-mg intra-articular injection of anakinra an average of 15 days after knee injury led to a statistically and clinically significant 10.5-point improvement in the KOOS activity of daily living score 4 days after injection. Patients receiving a placebo injection showed no significant improvement.

Data Source: Randomized, placebo-controlled pilot study with 11 patients.

Disclosures: Dr. Kraus's study did not have commercial funding. She said she had no relevant financial conflicts.

"We should start to treat joint injury much more emergently, like an acute myocardial infarction." Acute joint injury "is a critical event where early intervention might improve long-term outcome," including heading off the eventual development of osteoarthritis, Dr. Virginia Byers Kraus said at the meeting.

"Blocking sterile inflammation early in acute, joint injury may be a means to stop development of chronic tissue injury and post-traumatic osteoarthritis," said Dr. Kraus, professor of medicine at Duke University in Durham, N.C. "The early phase of acute joint injury represents a window of opportunity for providing treatment to promote healing and to prevent a subsequent cascade of joint destructive processes.

The study enrolled 11 patients younger than 40 within the first month following an MRI-confirmed tear of their anterior cruciate ligament in one knee. Following randomization, six patients received a single, 150-mg intra-articular injection of anakinra, which is an interleukin-1 (IL-1) receptor antagonist that blocks the effects of IL-1, a primary proinflammatory cytokine. The other five patients received saline injections. Anakinra (Kineret) has U.S. approval for the treatment of rheumatoid arthritis by subcutaneous injection, but carries no approval for the treatment of osteoarthritis or for intra-articular injection.

The age of the 11 patients averaged 24 years (range, 18-29 years). They received their injections an average of 15 days after their injury (range, 6-27 days).

Four days after treatment, patients who received an anakinra injection had significant and clinically meaningful improvements in several measures on the Knee Injury and Osteoarthritis Outcome Score (KOOS), improvements not seen in placebo patients, she reported.

The KOOS pain subscore fell by an average of 3.8 points in anakinra-treated patients, a statistically significant 23% relative improvement, compared with no significant change in placebo patients. The KOOS activities of daily living subscore showed a similar pattern, falling by a statistically significant 10.5 points in the anakinra-treated group, a 46% relative improvement compared with baseline.

Prior results showed that a change of 8-10 points in this measure corresponded to a clinically significant change after reconstruction of the anterior cruciate ligament, Dr. Kraus said at the congress, sponsored by the Osteoarthritis Research Society International.

The total KOOS score improved by an average of 20 points in the drug-treated patients, a significant 24% relative improvement, compared with no significant change in the placebo patients.

The anakinra-treated patients also showed strong trends toward further improvements in total KOOS score and activity subscore when they underwent another assessment 14 days after their injection, while the placebo patients continued to show no substantial changes. ■