CRP Linked to Local Inflammation in Osteoarthritis

BY DIANA MAHONEY
New England Bureau

BOSTON — A strong and statistically significant correlation between systemic C-reactive protein levels and inflammatory infiltrates in the joints of individuals with osteoarthritis in a recent study offers clues into the mechanistic link between the systemic inflammatory marker and disease activity, Dr. Carla R. Scanzello said at the 10th World Congress on Osteoarthritis sponsored by the Osteoarthritis Research Society International.

Previous studies have demonstrated an association between systemic C-reactive protein (CRP) levels and disease progression, clinical severity, and pain in osteoarthritis.

But these findings are the first to link CRP levels to local inflammatory findings, Dr. Scanzello reported in a poster presentation.

To investigate the relationship between systemic CRP levels and local joint inflammation, Dr. Scanzello, with lead investigator Dr. Andrew Pearle and colleagues at the Hospital for Special Surgery in New York, evaluated the appearance, histology, and interleukin-6 (IL-6) levels in synovial fluid from 52 patients with ideopathic arthritis.

The investigators collected plasma and synovial membrane specimens from these patients, all of whom were scheduled to undergo total knee or hip arthroplasty or knee arthroscopy for osteoarthritis.

The researchers also collected joint fluid samples from a subgroup of 26 of these patients prior to surgery.

Synovial membrane inflammation was graded intraoperatively and by subsequent histologic examination, and synovial fluid IL-6 levels and plasma CRP levels were measured using a high-sensitivity enzyme-linked immunosorbent assay.

Of the full cohort, 26 patients had low-grade inflammatory infiltrates on histologic analysis and 4 patients had high-grade infiltrates.

The mean CRP level in the patients with inflammatory infiltrates was 4.7 µg/mL, which was significantly higher than the mean of 1.7 µg/mL in patients without inflammation. In addition, the degree of inflammation had a statistically significant correlation with systemic CRP levels ($r = 0.42$), Dr. Scanzello commented.

While plasma IL-6 levels were difficult to detect, the average synovial fluid level was 88.02 pg/mL in patients from whom a synovial fluid sample was taken.

While there was no significant difference between patients with and without synovial infiltrates in mean age, body mass index, or gender, "there was a trend toward slightly higher BMI in the group with histologic infiltrates," Dr. Scanzello said.

With respect to measures of IL-6, a known regulator of the acute phase response, "the plasma IL-6 levels were difficult to detect in most of the osteoarthritis patients."

However, the average synovial fluid IL-6 level in the patients from whom synovial fluid samples were collected was 88.02 pg/mL, according to Dr. Scanzello.

There was a significant correlation between those levels and systemic CRP levels ($r = 0.63$), she said.

The investigators observed modest but statistically significant correlations between CRP levels and BMI, and multiple linear regression analysis revealed that both BMI and degree of inflammation were significantly associated with CRP levels.

While the significance of the BMI connection is unclear, "it's possible that patients with elevated BMI are more likely to develop inflammation within the joint," said Dr. Scanzello.

The correlation between CRP and inflammatory infiltrates found in this investigation, taken together with results from earlier studies linking high CRP levels with more rapid disease progression and more severe pain, suggests that "osteoarthritis patients with elevated high-sensitivity CRP may make up a subgroup of patients with synovial inflammation and with a more aggressive form of disease," Dr. Scanzello concluded. ■