Protein level may serve as predictor of severe osteoarthritis

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Osteoarthritis (OA), the most common joint disorder throughout the world and a leading cause of disability, is characterized by pain, impaired joint mobility, reduction of muscular strength and loss of joint function. Unlike most other common diseases, little is known about its origins, and factors predicting a severe disease course have not been identified. A new study, the first to establish a laboratory marker for the risk of severe OA, found that vascular cell adhesion molecule 1 (VCAM-1), was a strong predictor of hip and knee joint replacement due to severe OA. The study was published in the August issue of *Arthritis & Rheumatism*.

Led by Georg Schett of the University of Erlangen-Nuremberg in Erlangen, Germany, the study involved 912 healthy individuals in Bruneck, Italy, 60 of whom underwent hip or knee replacement surgery due to severe OA in a 15-year follow-up period. Subjects underwent a baseline exam in 1990 and followup exams were performed every five years until 2005. Blood samples were analyzed for VCAM-1, a sialoglycoprotein (a combination sugar and protein) expressed on cells in the cartilage and connective tissue.

The results showed that VCAM-1 levels were substantially elevated in the 60 individuals who underwent joint replacement, with the highest baseline levels seen in those who underwent bilateral joint replacement. "The level of VCAM-1 emerged as a significant predictor of the risk of joint replacement due to severe OA, equaling or even surpassing the effects of age," the authors state. They also note that inclusion of

VCAM-1 levels in risk prediction models resulted in a more accurate classification of individuals.

VCAM-1 promotes leukocyte adhesion and homing to sites of inflammation. In chondrocytes (cartilage cells), VCAM-1 expression is induced by inflammatory cytokines (proteins released by immune system ells). The authors suggest that increased VCAM-1 levels may therefore mirror active cartilage damage or an inflammatory component in OA. Since it mediates the interaction of chondrocytes with immune cells, VCAM-1 may also contribute to immune-mediated cartilage damage.

Establishing laboratory biomarkers of severe OA is important for a number of reasons. The standard risk factors of age and weight are not enough for accurate risk prediction, and since OA is a highly prevalent disease, it would be helpful to accurately identify those at greater risk of developing rapid progression or severe disease. Early diagnosis would also be beneficial because the disease is present before clinical symptoms are present. Finally, improved prediction of severe OA would help identify patients for treatment interventions such as aerobic exercise, strength training and weight loss and might also help tailor therapeutic measures.

"Further clarification of the mechanism underlying the association between VCAM-1 level and OA may well contribute to a better understanding of disease etiology," the authors conclude, adding that application of their findings in routine clinical practice would require further studies to duplicate the results.

More information: http://www.interscience.wiley.com/journal/arthritis

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