

PUTATIVE MARKERS OF OSTEOARTHRITIS AND THEIR DETECTION IN THE KNEE JOINT CARTILAGE AND SYNOVIUM

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Introduction. Osteoarthritis (OA) has long been considered as a simple "wear and tear" condition leading to the loss of cartilage. However, progress in molecular biology in last decades has greatly changed this paradigm. The discovery that many soluble mediators can increase the production of matrix metalloproteinases (MMPs) by chondrocytes led to the steps towards an "inflammatory" theory. Synovitis is now accepted as a critical feature of OA and also subchondral bone may have a substantial role in the OA process. Thus, OA is a much more complex disease with inflammatory mediators released by cartilage, bone and synovium. Determining the key molecules in the pathogenesis of OA would give an opportunity to perform early diagnosis and preventive treatment. One of OA putative markers is discoidin domain receptor 2 (DDR-2), which is a cell surface receptor tyrosine kinase that predominantly interacts with type II collagen and amplifies the MMP-13 production in chondrocytes. Another marker of interest for us is the cartilage intermediate layer protein 1 (CILP-1), which is a structural component of the cartilage extracellular matrix but we have some preliminary data of CILP-1 expression in the synovial membrane.

Aim. The objective of the study was to find possible correlation between the extent of DDR-2 and CILP-1 expression with cartilage damage in patients with OA of the knee joint.

Methods. Cartilage and synovial samples were obtained during arthroscopy from 42 patients (22 women and 20 men; age from 32 to 60 year, mean age 46.7 years), the expression of DDR-2 in cartilage sections and CILP-1 in synovial tissues were detected by immunohistochemical staining. Modified Mankin score was used to assess cartilage damage.

Results. Regardless the significant expression of DDR-2 in the cartilage of patients with osteoarthritis of the knee joint, there was no significant correlation between Mankin score and the extent of DDR-2 staining. Immunohistochemical staining of CILP-1 was found in blood vessels, in particular in the medial layer, and in synoviocytes A and B of the synovial membrane. Macrophage-like cells (synoviocytes A) with positive staining for CILP-1 were confirmed by double immunofluorescence staining for CD68.

Conclusions. The study showed the presence of DDR-2 in the cartilage in patients with OA and demonstrated its relation to the proteoglycan content of articular cartilage, which could also be a factor of OA development. Nevertheless, no clear correlation between cartilage damage and amount of DDR-2 staining was found. CILP-1 was detected in the synovial membranes of osteoarthritis patients and was demonstrated to localize in the synovial blood vessels and macrophage-like cells. The further research should correlate the degree of osteoarthritis, synovitis and the synovial expression of CILP-1.

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