COLL2-1 AND COLL2-1NO₂, TWO ORIGINAL TYPE II COLLAGEN BIOMARKERS, ARE USEFUL IN ANIMALS MODELS AND IN HUMAN CLINICAL STUDIES

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PURPOSE

To summarize the results on two original biological markers of cartilage degradation, Coll2-1 and Coll2-1NO₂.

RESULTS

In double deficient mice for fibromodulin and biglycan, a strain that develops severe premature knee and temporomandibular osteoarthritis, Coll2-1 serum concentration was higher than in wild-type animals [1].

In dogs after an anterior cruciate ligament transection, Coll2-1 serum concentration increased by 23% after 2 weeks and by 18% after 6 weeks post-surgery [2].

In male Hartley guinea pig, a strain of guinea pig that spontaneously develop OA, Coll2-1 levels in serum increased with the appearance of the early disruption of the collagen fibril and was correlated with histological severity of the cartilage lesions [3].

In horses developing a juvenile digital degenerative arthropathy (osteocondritis), an uncoupled variation of Coll2-1 and Coll2-1NO₂ levels in plasma was demonstrated [4]. Coll2-1NO₂ was increased whereas Coll2-1 levels trended toward a decrease.

Serum Coll2-1 levels were 1.6 and 1.4 times higher in patients with osteoarthritis or with rheumatoid arthritis (RA), respectively, than in age-matched control. In contrast, the Coll2-1NO₂ concentration was higher in RA patients than in OA patients [5].

In the placebo group of a 3-year follow-up glucosamine sulfate study, the 1-year increase in urinary Coll2-1 and Coll2-1NO₂ was negatively correlated with the 3-year change in minimum joint space width, indicating that decreases in levels of these biomarkers in urine is predictive of the radiological OA progression [6].

Finally, the normalization of coll2-1 serum levels, 3 months after joint replacement in patients with isolated unilateral knee or hip osteoarthritis, indicates that Coll2-1 is a disease-specific marker that is sensitive to structural changes occurring in one single joint. Immunohistochemistry analysis revealed the extensive presence of Coll2-1 and Coll2-1NO₂ in the superficial layer of fibrillated cartilage and around some cells clusters [7].

References:

Conclusions

Based on these experimental data, Coll2-1 and Coll2-1NO₂ are considered as pertinent diagnosis, prognosis and burden of disease biomarkers according the classification criteria of the newly proposed BIPED classification scheme by the Osteoarthritis Biomarkers Network, a consortium of five NIH designated sites.