Background: Coll2-1 is a peptide of 9 amino acid located in the triple helix of type II collagen molecule reflecting cartilage degradation (1). Coll2-1NO2, the nitrated form of Coll2-1, is produced in the synovial fluid (SF) during KJD treatment. 1 However, animal and ex vivo human studies have shown that TGFβ-1 increases in SF during KJD treatment and may also be associated with osteophytosis.

Objectives: To identify if biochemical markers s-Coll2-1 and s-Coll2-1NO2 are associated to a worsening of target knee OA patients as structural features assessed by MRI in various knee compartments and to assess their ability at predicting knee OA worsening.

Methods: 116 subjects with knee OA were followed during one year with pain, function and MRI evaluation (PRODIGE study, NCT02070224). Type II collagen-specific biomarker Coll2-1 and its nitrated form Coll2-1NO2 were directly measured in serum using immunoassays at baseline and after three, six and twelve months follow-up.

Results: s-Coll2-1 and s-Coll2-1NO2 were associated to several baseline knee features quantified with Whole-Organ Magnetic Resonance Imaging Score (WORMS). S-Coll2-1 was significantly correlated with burstus (r=0.29, P<0.01), bone attrition (r=0.25, P=0.01), cysts (r=0.24, P=0.02) and cartilage (r=0.23, P=0.03) WORMS subscores for the whole joint as well as with the medial femorotibial joint sum score (r=0.26, P=0.01) and medial femorotibial joint cartilage (r=0.23, P=0.02). s-Coll2-1NO2 was correlated with WORMS total score (r=0.23, P=0.02), WORMS scores in the patellofemoral joint (r=0.22, P=0.03) and with osteophytes scores (r=0.27, P=0.01). Baseline s-Coll2-1NO2 was higher in subjects with a pain worsening (426.4 pg/mL [278.04-566.95]) as compared to non-progressors (306.8 [200.37-427.84]) over one year (AUC=0.655, P=0.015).

Conclusion: Cartilage biomarkers s-Coll2-1 and s-Coll2-1NO2 are associated to several knee OA features quantified with WORMS scoring system on MRI. Serum values of Coll2-1NO2 are also associated to a worsening of target knee pain over one year. Coll2-1 and Coll2-1NO2, in association with other structural features, pain and function, could help at identifying OA phenotypes and patients at risk of OA worsening.

References: