# CARTILAGE DEGRADATION AND OXIDATIVE DAMAGE IN OA AND RA PATIENTS.

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## AIM :

Protein nitration is a prominent feature of inflammation in joint. Our aim was to determine Coll 2-1 level , a peptide of type II collagen triple helix, and its nitrated form (Coll 2-1 $NO_2$) in serum of patients with early osteoarthritis (OA) and rheumatoid arthritis (RA).

## MATERIALS AND METHODS

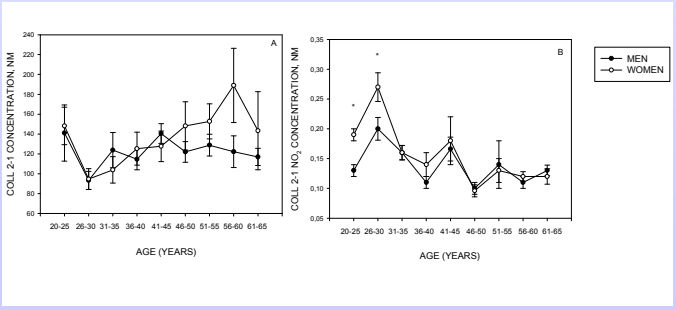
Coll 2-1 and Coll 2-1 $NO_2$ were measured in sera of 242 healthy subjects, 10 patients with early knee OA and 14 patients with early RA by two specific competitive immunoassays. These immunoassays are specific for amino acids sequence in the α triple helix of type II collagen, $^{108}$HRGYPGLDG$^{116}$ (Coll 2-1), and its nitrated form (Coll 2-1 $NO_2$), respectively. The Coll 2-1 and Coll 2-1 $NO_2$ values were expressed as mean ± SEM. The non-parametric Mann-Whitney U-test was used to estimate the differences between each group of patients.

## RESULTS

### 1. Reference values

Coll 2-1 and Coll 2-1 $NO_2$ concentrations during lifetime

In normal subjects (n=242), the mean concentrations of Coll 2-1 and Coll 2-1 $NO_2$ were 125.13 ± 3.71 nM and 0.16 ± 0.08 nM, respectively. When the population was stratified by 5 years brackets, Coll 2-1 and Coll 2-1 $NO_2$ serum levels did not significantly vary in the investigated age interval (Figures 1 A and B).




Figures 1 A and B :
Coll 2-1 (A) and Coll 2-1 $NO_2$ (B) concentrations in healthy subjects aged from 20 to 65 years.

Circadian variation of Coll 2-1 and Coll 2-1 $NO_2$

The daily variation for Coll 2-1 and Coll 2-1 $NO_2$ was less than 10 % and 15%, respectively (Figure 2).

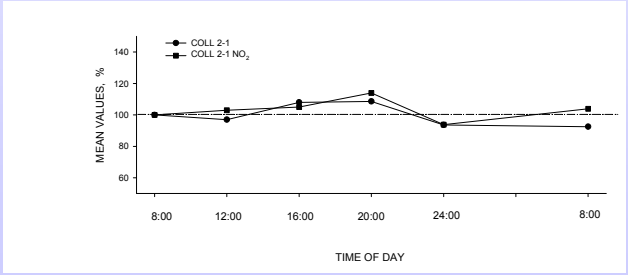



Figure 2 :
Coll 2-1 and Coll 2-1 $NO_2$ concentrations in healthy subjects (n=9) during a day.

### 2. Coll 2-1 $NO_2$ concentration in premenopausal women versus postmenopausal women

When subjects aged from 46 to 55 years corresponding to the early postmenopausal were removed, Coll 2-1 $NO_2$ level was significantly higher in premenopausal women than in postmenopausal women. Further, before 45 years old, Coll 2-1 $NO_2$ level in serum was significantly higher in women than in men (0.22 ± 0.02 nM vs 0.16 ± 0.08 nM, p = 0.03), but decreased to men level after 55 years old (Figure 3).

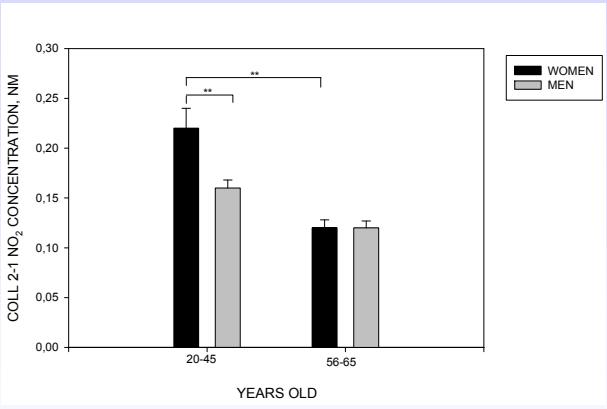
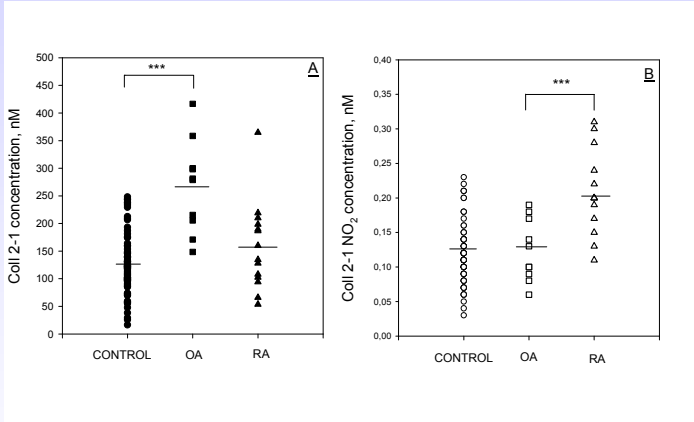



Figure 3:
Coll 2-1 $NO_2$ concentration in men and women.

### 3. Coll 2-1 and Coll 2-1 $NO_2$ concentrations in OA and RA patients

The Coll 2-1 level was higher (p<0.001) in serum of knee OA patients than in normal age-matched subjects (n= 80) (267.45 ± 26.42 nM vs 126.78 ± 6.61 nM), whereas Coll 2-1 $NO_2$ level was identical. In RA patients, the Coll 2-1 $NO_2$ concentration was 1.6 times higher (p<0.001) compared to the normal subjects (0.21 ± 0.02 nM vs 0.13 ± 0.03 nM), whereas Coll 2-1 concentration was not significantly different (158.35 ± 21.35 nM vs 126.78 ± 6.61 nM) (Figures 4 A and B).




Figures 4:
Coll 2-1 (A) and Coll 2-1 $NO_2$ (B) concentrations in OA and RA patients

## CONCLUSIONS

**These findings suggest that Coll 2-1 nitration is directly related with synovium inflammation and that Coll 2-1 $NO_2$ could be a promising marker of RA disease activity. In contrast, Coll 2-1 increase could be an interesting marker for detection of early structural changes in OA patients. Finally, these assays could be useful to elucidate type II collagen degradation and oxidative damages in inflammatory joint diseases.**