Coll2-1NO$_2$: A biomarker for early knee osteoarthritis?

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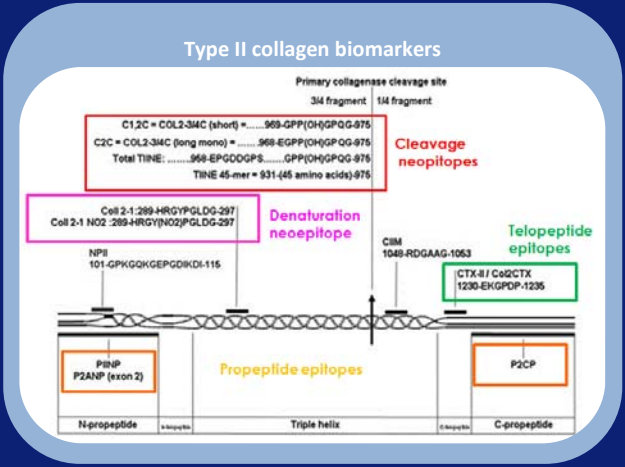
Low baseline urinary Coll2-1NO$_2$ levels were significantly associated with an increased incidence of knee OA in overweight and obese middle-aged women



Introduction

Up to now there is no curative treatment for knee osteoarthritis (OA), only symptomatic treatment of pain and loss of function exists. To change this situation, it seems necessary to focus on prevention of the initial development of knee OA. In this context it is essential to have diagnostic tools to detect knee OA in an early, pre-clinical stage.

Methods

We used data from the PROOF study; 407 women between 50 and 60 years with a BMI ≥ 27 kg/m^2 and without knee complaints were invited for baseline measurements. Baseline, 1 and 2.5 years urinary Coll2-1NO$_2$ levels were assessed using ELISA and adjusted for urinary creatinine (nMol/mMol). Primary outcome measure was incidence of knee OA, defined as incidence of either Kellgren & Lawrence grade ≥ 2, medial or lateral joint space narrowing ≥ 1.0 mm or clinical knee OA (clinical and radiographic ACR-criteria) in one or both knees. Progression of cartilage defects on MRI served as secondary outcome measure.

Baseline characeristics

	N = 254
Age (yr.)	55.8 ± 3.2
BMI (kg/m^2)	31.9 ± 4.0
K&L ≥ 1	55%
Postmenopausal	70%
Mild symptoms	43%
History of injury	18%
WOMAC pain	6.2 ± 10.1
WOMAC function	6.2 ± 10.1

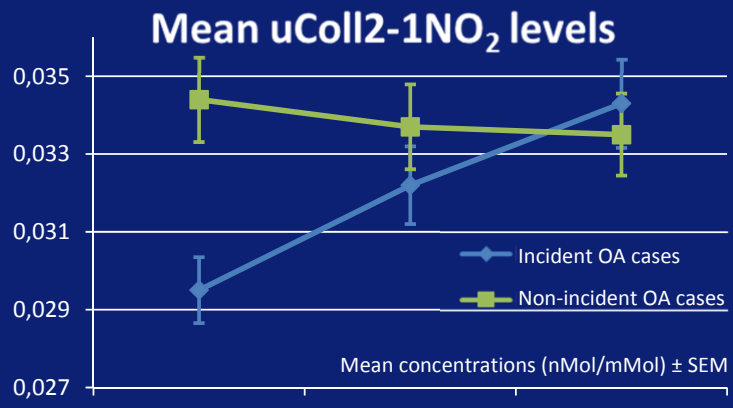
Results

All 254 women (62%) with baseline and follow-up Coll2-1NO$_2$ concentration and primary outcome measure available were selected for the analyses.
After 2.5 years, OA developed in one or both knees in 28% of all women and cartilage defect progression was found in 49%. A significant inversed association between baseline Coll2-1NO$_2$ concentration and incidence of knee OA (OR 0.74, 95% CI: 0.55-0.99); see Figure. A trend towards a significant positive association between increased Coll2-1NO$_2$ concentration during follow-up and incidence of knee OA (OR 1.10, 95% CI: 0.81-1.48) and progression of cartilage defects (OR 1.26, 95% CI: 0.93-1.70) was found.

Conclusions

A lower urinary Coll2-1NO2 concentration is associated with an increased risk for incident knee OA in overweight and obese women. Possible mechanisms:

- increased synthesis of extracellular matrix in early OA
- inhibition of NO by IL-10 as early compensatory mechanism to protect the articular cartilage
- lower cartilage volume in subjects who develop OA



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