Collagen degradation profile in serum of patients with COPD or IPF

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Body: Introduction: Fibrosis is a common consequence of COPD and IPF characterized by fibroblast proliferation and extracellular matrix (ECM) remodeling. The most representative ECM component in lungs is collagen, and an imbalance in collagen turnover rate may lead to its accumulation eventually resulting in fibrosis. Aims and objectives: During pulmonary fibrosis collagens type I, III, IV, V, VI are deposited in the lungs and are degraded by disease relevant proteases. Thus collagen fragments (neoepitopes) are released into circulation: our aim is to investigate their potential as markers for lung ECM turnover. Methods: Levels of serum matrix metalloprotease degraded type I (C1M), III (C3M), IV (C4M), V (C5M) and VI (C6M) collagen and ADAMTS-4 degraded type III collagen (C3A) were assessed in serum from patient with COPD or IPF and healthy controls using a competitive ELISA assay. Results: All serum markers were significantly elevated in COPD compared to controls (p<0.05-0.01, up to +289% for C1M), and C1M, C3M, C5M and C6M were highly elevated in all severity groups of IPF (p<0.05-0.0001, up to +233% for C1M). The area under the curve calculated using the receiver operating characteristic (AUROC), describing the diagnostic power of the marker, was >85% for C1M, C3M, C5M and C6M for COPD and IPF patients versus controls, while C4M and C3A had an AUROC>89% for COPD versus controls but were unable to diagnose IPF patients. Conclusions: Four out of six collagen degradation serum markers were elevated in patients with mild COPD and IPF, who would benefit the most from early diagnosis. This small study highlights the potential of neoepitope collagen turnover marker for separation of healthy versus COPD and IPF patients.