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Title: Comparable matrix alterations in the alveolar and small airway wall of COPD patients

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Body: Rationale: Remodeling in COPD is considered twofold with thickening of the wall of airways <2mm on one hand and destruction of alveolar walls on the other. However, we hypothesize that matrix alterations in both alveolar and small airway (SA) walls of COPD patients show more similarity. Methods: Lung tissue sections of 8 smoking controls and 10 moderate to severe COPD patients were stained for elastin by Weigert's Resorcin-Fuchsin and collagen 1, 2 and 3 by Picrosirius red. In addition, hyaluronan, a glycosaminoglycan matrix component, was stained with a hyaluronan binding protein. All stainings were corrected for total surface area and data expressed as mean % of stained area ± SD. Results: Elastin was significantly decreased in COPD in both alveolar (27.7% ± 5.3 vs. 17.9% ± 3.3, p<0.01) and SA walls (24.2% ± 4.4 vs. 15.2% ± 2.7, p<0.01). Both collagen in alveolar (11.6% ± 5.4 vs. 25.9% ± 10.4, p<0.01) and SA walls (11.8% ± 2.3 vs. 23.2% ± 6.7, p<0.01) and hyaluronan in alveolar (11.7% ± 3.2 vs. 19.8% ± 3.5, p<0.01) and SA walls (12.9% ± 5.4 vs. 25.6% ± 10.0, p<0.05) increased significantly. Alveolar and SA wall matrix components correlated significantly: elastin (r=0.644, p<0.01), collagen (r=0.741, p<0.01) and hyaluronan (r=0.626, p<0.05). Furthermore matrix compounds were significantly related with FEV_1 : alveolar elastin (r=0.742, p<0.01), SA elastin (r=0.824, p<0.01), alveolar collagen (r=-0.755, p<0.01), SA collagen (r=-0.675, p<0.01), alveolar hyaluronan (r=-0.775, p<0.01) and SA hyaluronan (r=-0.538, p<0.05). Conclusion: These results indicate that remodeling in the alveolar and SA wall in COPD show marked similarities and both relate to FEV_1.