

## Publication

## Acute Exacerbations of COPD Are Associated With Increased Expression of Heparan Sulfate and Chondroitin Sulfate in BAL

## JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 4407795

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**BACKGROUND:** Acute exacerbations of COPD (AECOPDs) are associated with accelerated aggravation of clinical symptoms and deterioration of pulmonary function. The mechanisms by which exacerbations may contribute to airway remodeling and declined lung function are poorly understood. We investigated whether AECOPDs are associated with differential expression of glycosaminoglycans in BAL in a cohort of 97 patients with COPD. **METHODS:** Patients with COPD with either stable disease ( $n = 53$ ) or AECOPD ( $n = 44$ ) and undergoing diagnostic bronchoscopy were matched for demographics and lung function parameters. Levels of heparan sulfate, chondroitin sulfate, dermatan sulfate, and matrix metalloproteinases (MMPs) in BAL were measured by enzyme-linked immunosorbent assay. **RESULTS:** Heparan sulfate and chondroitin sulfate were significantly increased in BAL of patients during exacerbations. Levels of heparan sulfate were higher in the BAL of patients with microbial infections. Chondroitin sulfate was negatively correlated with FEV1 % predicted but not with diffusing capacity of lung for carbon monoxide % predicted, indicating that chondroitin sulfate is associated with airway remodeling, leading to obstruction rather than to emphysema. Furthermore, heparan sulfate and chondroitin sulfate were significantly correlated with MMP-9, MMP-2, and MMP-12 in BAL, indicating that they were cleaved from their respective proteoglycans by MMPs and subsequently washed out in BAL. **CONCLUSIONS:** During AECOPD, there is increased expression of heparan sulfate and chondroitin sulfate in BAL. These molecules are significantly correlated with MMPs in BAL, indicating that they may be associated with

airway remodeling and may lead to lung function decline during exacerbations of COPD.

**Publisher** AMER COLL CHEST PHYSICIANS

**ISSN/ISBN** 1931-3543

**edoc-URL** <https://edoc.unibas.ch/62428/>

**Full Text on edoc** No;

**Digital Object Identifier DOI** 10.1378/chest.14-2868

**PubMed ID** <http://www.ncbi.nlm.nih.gov/pubmed/26226327>

**ISI-Number** WOS:000371474200022

**Document type (ISI)** Journal Article