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Downregulation of *NLRP3*, *CASP1* and *IL1B* expression in COPD patients after lung transplantation

COPD - mechanism, Treatments, Experimental approaches

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Introduction: Emerging evidence suggests that the nucleotide-binding oligomerization domain-like receptor family pyrin domain-containing 3 (NLRP3) inflammasome plays an important role in the pathogenesis of COPD. Moreover, it may be involved in ongoing chronic inflammation that is present in patients with end-stage COPD who are candidates for lung transplantation (LT). Aims and objectives: The aim of this study was to determine the gene expression of *NLRP3*, caspase-1 (*CASP1*) and interleukin-1β (*IL1B*) in 5 patients with COPD before LT and 1 year after LT. Methods: Gene expression was examined by qPCR in the peripheral blood samples using the commercial TaqMan gene expression assays and the calculation of the relative mRNA expression was performed by the $2^{-\Delta\Delta Ct}$ method. Spirometry parameters were determined before and after LT while symptoms burden, history of exacerbations and health status were assessed by mMRC, CAT and SGRQ-C scores. Results were statistically significant if $P < 0.05$. Results: Gene expressions of *NLRP3*, *CASP1* and *IL1B* were significantly downregulated in patients one year after LT (P=0.009, P=0.014, P=0.005, respectively). On the other hand, spirometry values were significantly increased at 1-year post-transplantation period with FEV_1 (L) increasing from 0.59 to 3.22 (P=0.002) and FVC (L) from 1.81 to 3.57 (P=0.014). In addition, significant improvements in mMRC, CAT and SGRQ-C scores were observed after LT (P=0.041, P=0.035 and P= 0.015, respectively). Conclusions: *NLRP3, CASP1* and *IL1B* expression were decreased in lung transplant recipients with COPD one year after LT, suggesting a significant involvement of NLRP3 inflammasome in severe COPD.