



DECREASED CONCENTRATION OF EXTRACELLULAR HEAT SHOCK PROTEIN 70 AND GENE EXPRESSION OF TOLL-LIKE RECEPTOR 4 AFTER LUNG TRANSPLANTATION IN COPD PATIENTS

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Objective:

Introduction: Heat shock protein 70 (Hsp70) can be found in the extracellular compartment and it is considered that extracellular Hsp70 (eHsp70) contributes to inflammation in chronic obstructive pulmonary disease (COPD). eHsp70 mainly acts pro-inflammatory and activates immune responses by engaging Toll-like receptors (TLRs) 2 and 4. 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 the study was to compare eHsp70 concentration and *TLR2* and *TLR4* gene expression in 5 COPD patients before LT and one year after LT.

Methods: Spirometry was performed before and after LT. Dyspnoea grade was assessed by modified Medical Research Council (mMRC), symptoms burden and history of exacerbations by COPD Assessment Test (CAT score), and health status by St. Georges Respiratory Questionnaire (SGRQ-C) score for COPD patients. Concentration of eHsp70 was measured by enzyme-linked immunosorbent assay (ELISA) (Enzo Life Science, Farmingdale, NY, USA), while *TLR2* and *TLR4* expression was examined by quantitative polymerase chain reaction (qPCR) in the peripheral blood samples using the TaqMan gene expression assays (Applied Biosystems, Foster City, CA, USA). The calculation of the relative gene expression was performed by the $2^{-\Delta\Delta Ct}$ method. Results were statistically significant if $P < 0.05$.

Results: Spirometry values were significantly increased at one-year post-transplantation period with FEV₁ (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). Concentration of eHsp70 as well as gene expression of *TLR4* were significantly decreased in COPD patients one year after LT ($P = 0.010$ and $P = 0.001$, respectively). No statistically significant difference was observed regarding *TLR2* before and after LT ($P = 0.064$).

Conclusion eHSP70 and *TLR4* were decreased in lung transplant recipients with COPD one year after LT suggesting their potential significant role in the pathogenesis of severe COPD.



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