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ENDOTOXIN MARKERS ASSESSED IN BAL OF PATIENTS WITH INTERSTITIAL LUNG DISEASES

B. Szponar, J. Domagała-Kulawik

Ludwik Hirszfeld Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw, Poland, and Lund University, Dept. of Laboratory Medicine, Sect. of Medical Microbiology, Lund, Sweden; Department of Pneumonology and Allergology, Medical University of Warsaw, Poland

Background. Endotoxins (lipopolysaccharide, LPS), components of Gram-negative bacteria cell wall, are ubiquitous in the indoor environment and were assessed in tobacco and secondary tobacco smoke (ETS). Inhalation of LPS is associated with e.g. airway inflammation and asthma exacerbation. Analytical measurement of the endotoxin chemical markers, 3-hydroxy fatty acids (3-OHFAs, exclusively present in lipid A, the LPS most conservative part) is routinely applied for endotoxin assessment in indoor environments. The aim of this study was an evaluation of endotoxins in BAL from patients suffering from interstitial lung diseases (ILD) and critical evaluation of the relationship of endotoxins concentration with BALF cellular composition.

Methods. BAL was obtained from patients with diffuse lung diseases: idiopathic pulmonary fibrosis (n=42), sarcoidosis (n=22), smoking-related-ILD (n=11) and eosinophilic disorders (n=7). BAL was prepared according to standards, the total cell count and differential cell count was determined. Samples of supernatants were lyophilized, weighted and subjected to hydrolysis to release 3-OHFAs, followed by derivatisation and analysis by gas chromatography-tandem mass spectrometry (GC-MSMS). Internal standard was added to quantify the results [1].

Results. Among selected diseases the highest endotoxin level has been revealed in supernatants of BAL of patients with eosinophilic disorders (table).

	n	endotoxin [median]	P25	P75	quadril range
sarcoidosis	22	6.1	3	20	7
lung fibrosis	42	8.9	6.4	12.6	6.2
sr ILD[1]	11	8.4	7	19	12
eosinophilic disorders[2]	7	23	7.6	61.8	54

[1]including chronic eosinophilic pneumonia, Wegener granulomatosis, Churg Strauss Syndrome; [2]sr ILD - smoking related interstitial lung diseases. Diagnosis of interstitial lung diseases according to ATS/ERS guidelines [2]

The endotoxin level was significantly higher in BAL of lung fibrosis vs. sarcoidosis patients. Endotoxin significantly correlated with proportion of eosinophils ($R=0.37$, $p<0.05$); the relation to macrophages proportion and count was negative ($R=-0.25$, $p<0.05$).

Conclusion. Determination of chemical markers of endotoxin has been proven to accurately assess its level in complicated biological matrices, and hereby also in BAL supernatant. Assuming the role that LPS holds as potent stimulator of inflammatory response and one of

PAMPs in innate immunity, studies on endotoxin relation to various interstitial lung disorders are continued.

References

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