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Paper Poster Session IV

Viral infection and disease

Human bocavirus infection induces cytokine expression associated with lung fibrosis

V. Eichhorn¹, S. Khalfaoui¹, M. Pieper¹, C. Karagiannidis², W. Windisch², O. Schildgen³, V. Schildgen¹

¹Institut für Pathologie- Kliniken der Stadt Köln gGmbH, Universität Witten/Herdecke, Cologne, Germany

²Lungenklinik Köln-Merheim- Kliniken der Stadt Köln gGmbH, Universität Witten/Herdecke, Cologne, Germany

³Kliniken der Stadt Köln- Universität Witten/Herdecke, Köln, Germany

Background: Since the discovery of human bocavirus in 2005 there is an increasing likelihood that the virus is associated with mild to severe respiratory disease and may contribute to chronic lung diseases by persisting in the infected host. In the present study the question was addressed if HBoV-infections could contribute to lung fibrosis as suggested by previously published clinical observations (Windisch *et al.*, 2013).

Methods: In a retrospective approach the expression of 80 cytokines in 20 HBoV positive bronchoalveolar lavages (BAL) and 12 HBoV-negative BAL was determined by semi-quantitative Western spot blot analyses. All samples were tested for respiratory pathogens and facultative lung-damaging viruses by the Respfinder Assay and the Meningofinder *plus* Assay (Pathofinder, Maastricht, The Netherlands).

Results: Although a large proportion of cytokines were regulated independent of the HBoV status, several cytokines associated with lung fibrosis were clearly upregulated in the HBoV-positive patient cohort. These cytokines include IL8, MCP-1, FGF-9, VEGF, TIMP-1, PIGF, TGF- β 2, Oncostatin-M, NAP-2 and others. Notably, the cohort include one case in which a serial BAL was sampled, and in which the HBoV-infection was acquired or reactivated between the first HBoV-negative BAL and before the second HBoV-positive BAL were taken.

Conclusion: This study shows that in adult patients with HBoV-DNA present in the BAL the development of lung fibrosis might be triggered by HBoV induced cytokine expression. This assumption is supported by a clinical case, in which the increase of fibrosis-associated cytokines goes ahead with an increase of HBoV-DNA copies in the BAL, which are part of a primary infection or a re-activation in the present case. Consequently it appears likely that HBoV might be associated with the development of lung fibrosis.

Reference:

Windisch, W., Schildgen, V., Malecki, M., Lenz, J., Brockmann, M., Karagiannidis, C. & Schildgen, O. (2013). Detection of HBoV DNA in idiopathic lung fibrosis, Cologne, Germany. *J Clin Virol* **58**, 325-327.