Eur J Med Res (2008) 13: 131-132

ARDS in an HIV-positive Patient Associated to Respiratory Syncytial Virus

E. Voigt[1], R. L. Tillmann[2], J.-C. Schewe[3], E. Molitor[4], O. Schildgen[2]

[1]Department of Internal Medicine, HIV-care Unit, [2]Institute for Virology,
[3]Department of Anaesthesiology and Intensive Care Medicine, [4]Institute for Medical Microbiology, Immunology, and Parasitology,
University Hospital Bonn, Bonn, Germany

Abstract
We describe a clinical case of ARDS in an HIV infected patient. ARDS was associated to a respiratory syncytial virus infection that triggered a suspected Pneumocystis infection that despite missing etiologic proofs was treated with antimycotics. As rather limited information on RSV associated ARDS in HIV patients is available in the current literature, this case is of significant interest.
Key words: CPAP, ARDS, HIV, atypical pneumonia, RSV

Introduction

The respiratory syncytial virus (RSV) is a well known pathogen belonging to the family of paramyxoviruses that causes respiratory disease mainly in children (Englund et al., 1997; Whimbey & Ghosh, 2000). In patients with distinct co-morbidities RSV is also known to induce severe clinical courses of atypical pneumonia that in immune-compromised patients may lead to an acute respiratory distress syndrome (ARDS), sometimes with a fatal outcome. Surprisingly, although the virus is known since decades, less is known on the role of RSV neither in the pathogenesis of pneumonia in adults, nor in immune-suppressed or HIV patients (King 1997; Whimbey 1995; Couch et al., 1997). As for both otherwise healthy adults and also for immunocompromised as well as HIV infected patients a number of reports of severe pneumonia associated to new or (re)emerging pathogens have been described (Englund et al., 2006; Kupfer et al., 2006) we have recently initiated a prospective study on the prevalence of such viruses in our patient cohorts (Müller et al., 2007; Kupfer et al., 2007). In search for such new pathogens we identified RSV as the single pathogen associated to severe pneumonia in an adult HIV patient.

Case Report

The previously healthy 42-yr-old caucasian male was admitted to our hospital with a 7-week history of worsening dyspnoea, productive cough, fatigue and significant weight loss. Since 10 days the patient suffered from high fevers up to 40OC. Furthermore the patient had a panaritium of the right index finger, which had been treated by surgical incision twice within the past 4 weeks. The patient was on oral antibiotic therapy with cefixim and roxithromycin for 10 days. On admission the patient presented highly dyspneic. With 15 liters of oxygen via a non-sealing face mask the respiratory rate was 33/min, PaO2 93 mm Hg, PaCO2 35 mm Hg and the pH 7.4, PaO2/FiO2 < 200; thereby, the latter quotient underlines the clinical severity of the ARDS in this patient. Chest X-ray showed bilateral patchy alveolar lower zone shadowing left more than right consistent with ARDS. On admission, total white cell count was 9.9 x 109/l, procalcitonin 0.44 μg/l, CD3/4+ lymphocytes 2% (8/μl), CD4/CD8 lymphocyte ratio 0.04. Serum HIV testing by enzyme-linked immunoassay and HIV-1 by western blot were positive as well as a positive HIV-p24 antigen testing. Quantitative HIV RNA (bDNA) revealed 130.000 copies/ml. Due to the clinical and radiological signs of atypical pneumonia and the risk of pneumocystis jiroveci pneumonia a calculated empiric antimicrobial therapy consisting of meropenem, erythromycin, moxifloxacin, sulfamethoxazole, trimethoprim, fluconazole and pentamidine (via inhalation) was initiated. A bronchoalveolar lavage was performed and blood cultures were drawn. To maintain adequate oxygenation highflow CPAP (continuous positive airway pressure) ventilation via a sealed face-mask was initiated.

Based on microbiological results (see below) antimicrobial therapy was deescalated after 3 days. However, intravenous sulfamethoxazole and trimethoprim was continued due the clinical appearance and likelihood of Pneumocystis jirovici pneumonia.

The patient tolerated the sealed face-mask very well, and due to excellent patient compliance CPAP was continuously administered for 5 days, thus avoiding intubation. Oxygenation improved slowly so that FiO2 and PEEP could be reduced gradually. On day +5 management was changed to intermittent CPAP with oxygen supplementation at intervals via a non sealing face-mask. Further improvement of the respiratory situation allowed weaning from intermittent CPAP and the patient could be transferred from the intensive care unit (ICU) to peripheral ward on day +12.

After admission to the peripheral ward the patient clinically further stabilized. Intravenous sulfamethoxa-

zole and trimethoprim was continued for up to three weeks while all other antibiotics were discontinued. An antiretroviral therapy was initiated including lopinavir/ritonavir plus emtricitabine and tenofovir. Consecutively a viral load decrease to 512 copies/ml within four weeks could be observed while CD3/4+ lymphocytes increased to 6% (118/µl). On day +21 the patient was discharged and is currently followed at the HIV outpatient department. He is on his antiretroviral therapy and on secondary prophylaxis with oral sulfamethoxazole and trimethoprim reporting general well being.

All microbiological results of bronchoalveolar lavage fluid (including direct immunofluorescence) and from blood cultures revealed negative results. Neither any bacteria causing respiratory diseases nor Pneumocystis jiroveci were detected in any of the specimen. In analogy to and with the identical methodology of previous cases PCR for human bocavirus (hBoV) and RT-PCR specific for human metapneumovirus (HMPV), human coronaviruses including the subtypes NL63, OC43, 229E, SARS, and HKU1, as well as RT-PCR for RSV and influenza viruses A and B were performed from the clinical samples, all revealing negative results except the RT-PCR for RSV.

Discussion

Based on both the clinical observations and the laboratory results it is rather likely that the pneumonia was associated to RSV rather than to any other pathogen. Still, due the clinical improvement within a few days after initiation of Pneumocystis jirovici-specific antibiotic treatment we cannot rule out Pneumocystis jirovici as the causing pathogen. However, besides the lack of a finding of any other pathogen the period the patient suffered from pneumonia also strongly resembled the clinical course of a typical RSV related atypical pneumonia. Consequently, in concert with earlier findings, not only Pneumocyctis jiroveci and Mycobacterium tuberculosis but also the new and (re)emerging viruses have to be tested in case of severe pneumonia of HIV patients.

Conflict of Interest Declaration and Ethical Consideration: None of the authors declared any conflict of interest. All investigation described here were performed in accordance with the Helsinki declaration in its most recent form and in accordance with German legislation. Furthermore, the study was conducted under an approval from the local ethical committee.

References

1. Whimbey E, Ghosh S. Respiratory syncytial virus infections in immunocompromised adults. Curr Clin Top Infect Dis. 2000;20:232-55.
2. King JC Jr. Community respiratory viruses in individuals with human immunodeficiency virus infection Am J Med. 1997; 102(3A):19-24; discussion 25-6.
3. Kupfer B, Vehreschild J, Cornely O, Kaiser R, Plum G, Viazov S, Franzen C, Tillmann RL, Simon A, Muller A, Schildgen O. Severe pneumonia and human bocavirus in adult. Emerg Infect Dis. 2006;12(10):1614-6.
4. Muller A, Kupfer B, Vehreschild J, Cornely O, Kaiser R, Seifert H, Viazov S, Tillmann RL, Franzen C, Simon A, Schildgen O. Fatal pneumonia associated with human metapneumovirus (HMPV) in a patient with myeloid leukemia and adenocarcinoma in the lung. Eur J Med Res. 2007;12(4):183-4.
5. Kupfer B, Simon A, Jonassen CM, Viazov S, Ditt V, Tillmann RL, Muller A, Matz B, Schildgen O. Two cases of severe obstructive pneumonia associated with an HKU1-like coronavirus. Eur J Med Res. 2007;12(3):134-8.
6. Englund JA, Boeckh M, Kuypers J, Nichols WG, Hackman RC, Morrow RA, Fredricks DN, Corey L. Brief communication: fatal human metapneumovirus infection in stem-cell transplant recipients. Ann Intern Med. 2006 Mar 7;144(5):344-9
7. King JC, Burke AR, Clemens JD, Nair P, Farley JJ, Vink PE, Batlas SR, Rao M, Johnson JP Respiratory syncytial virus illnesses in human immunodeficiency virus- and noninfected children. Pediatr Infect Dis J. 1993;12(9): 733-9
8. Whimbey E, Couch RB, Englund JA, Andreeff M, Goodrich JM, Raad II, Lewis V, Mirza N, Luna MA, Baxter B, et al. Respiratory syncytial virus pneumonia in hospitalized adult patients with leukemia Clin Infect Dis. 1995;21(2):376-9
9. Couch RB, Englund JA, Whimbey E. Respiratory viral infections in immunocompetent and immunocompromised persons. Am J Med. 1997;102(3A):2-9; discussion 25-6.

Received: July 2, 2007 / Accepted: January 9, 2008

Address for correspondence:
Priv.-Doz. Dr. rer. nat. Oliver Schildgen
Institute for Virology
Sigmund-Freud-Str. 25
53105 Bonn
Germany
Phone: ++49(0)228/28711697
Fax: ++49(0)228/28714433
E-mail: schildgen@mibi03.meb.uni-bonn.de