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Correspondence

Community-acquired adenoviral and pneumococcal pneumonia complicated by pulmonary aspergillosis in an immunocompetent adult

Dear Editor,

Human adenovirus (HAdV) infections are prevalent in children, usually associated with self-limiting upper respiratory diseases.[1] Lower respiratory tract or life-threatening infections occasionally occur in infants, younger children, or immunocompromised hosts.[2] Severe adenovirus pneumonia is uncommon in healthy adults and fatal diseases are rare. We reported a lethal adenovirus pneumonia with *Streptococcus pneumoniae* co-infection in a previously healthy adult.

Case report

A 57-year-old female smoker without chronic disease presented to our emergency department with complaints of intermittent fever, productive cough, rhinorrhea, headache, bone pain, myalgia, and progressive dyspnea for one week.

Upon arrival, she was febrile (temperature 39.5 °C), tachypnic (respiratory rate 32/min), and tachycardiac (pulse rate 119/min). Her blood pressure was 114/66 mmHg. She has hypoxemia with PaO_2 60 mmHg on FiO_2 50%. The chest film showed multilobar patches involving left upper, left lower, and right middle lobes.

She was admitted to the intensive care unit and received tracheal intubation for respiratory failure and vasopressor for septic shock. Pleural effusion analysis on the fourth day showed macrophage-predominant exudate. She underwent venovenous (V-V) extracorporeal membrane oxygenation (ECMO) on the fourth day after admission but needed venoarterial (V-A) ECMO for cardiogenic shock and continuous venovenous hemofiltration (CVVH) for stage 3 acute kidney injury on the next day.

For pathogen investigations, urine pneumococcal antigen was detected and sputum culture yielded penicillin-susceptible *S. pneumoniae*. The FilmArray respiratory panel (BioFire Diagnostics, Salt Lake City, Utah, USA) for nasopharyngeal swab reported adenovirus and HAdV was isolated from her nasopharyngeal swab, endotracheal aspirate, bronchoalveolar lavage (BAL), and pleural effusion specimens. On cytological examination of pleural effusion, atypical cells with viral inclusion were noted (Fig. 1). The sequencing result of the isolated adenovirus was compatible to HAdV type 7.

She received antibiotics for bacterial pneumonia, but *Candida tropicalis* candidemia with septic shock occurred on the 8th day. She had pulmonary aspergillosis on the 14th day, supported by elevated BAL galactomnnan index 5.69 (normal < 0.5) and bronchoscopic biopsy tissue culture yielding *Aspergillus fumigatus*. Ventilator-associated pneumonia with extensively drug-resistant *Acinetobacter baumannii* bacteremia developed on the 21st day and she expired five days later.

Discussion

To our knowledge, this is the first reported adult with severe HAdv pneumonia and pleurisy with typical cytopathic change in the pleural effusion. Few cases of HAdv pneumonia had been reported to be co-infected with bacteria, including *S. pneumoniae*.[3] To treat severe HAdv pneumonia, cidofovir is suggested but not accessible in Taiwan. Early ECMO therapy may be considered in patients with

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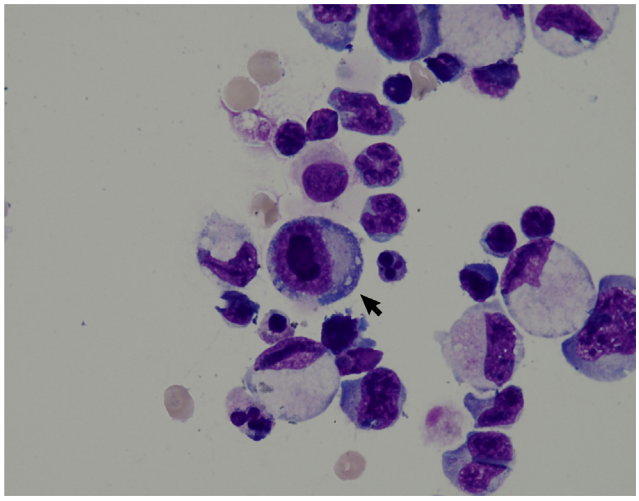

Figure 1. Liu's stain for pleural effusion (1,000X with oil immersion). One mesothelial cell shows deep purple-stained viral inclusion within the nucleus (arrow). The background shows mixed inflammatory cells, including lymphocytes, neutrophils and some monocytes.

severe acute respiratory distress syndrome, but the overall mortality remains high.[4]

The patient is also the first case with pulmonary aspergillosis developing after severe HAdv pneumonia without known immunodeficiency. While pulmonary aspergillosis had been linked to severe influenza, the role of severe HAdv pneumonia needs further studies.[5]

The current case reminds physicians that adenovirus infection should still be considered in an immunocompetent adult with bacterial pneumonia with lobar consolidations, and the hospital course may be complicated by various superinfections including aspergillosis.

Conflicts of interest

All authors have no conflicts of interest to declare.

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