Swapnil K., Snehal M.

HUMAN BOCAVIRUS AS AN INDEPENDENT PATHOGEN IN SEVERE LOWER RESPIRATORY TRACT INFECTIONS: A CASE-INTEGRATED REVIEW

Tutor: senior lecturer Ramanouskaya V.F.
Department of Pediatric Infectious Diseases with Advanced Training Courses and Retraining
Belarusian State Medical University, Minsk

Relevance. Human Bocavirus (HBoV) is frequently recognised as a co-infection and has, thus, often considered to be only in the 'passenger' role. However, several recent evidence and clinical cases have reinforced that HBoV can indeed be associated with primary severe pneumonia as a single agent. Its potential as an independent pathogen should be well recognised, since radiologically it may mimic chronic fibrotic changes or lymphoproliferative malignancies in infants, with the risk of their being diagnostically mistaken or misinterpreted as indicators for undue oncological intervention.

Aim: to establish that Human Bocavirus can be the direct and sole causative agent of severe pneumonia in infants and to characterise its clinical and radiological profile. To analyse the clinical and radiological progression of a confirmed HBoV infection in a one-year-old patient and to use high-sensitivity PCR to exclude common viral and atypical bacterial co-pathogens. Additionally, we aim to correlate these case findings with broader literature regarding HBoV-associated lung injury, particularly pyroptosis, and systemic complications.

Material and methods. This study combines a clinical case of a one-year-old female admitted to «City Children's Infectious Clinical Hospital», Minsk between December 2018 and January 2019 with a review of the literature on pediatric HBoV-positive pneumonia (Liao, J. et al. 2025). Diagnostic workup was performed by serial chest radiographs, contrast-enhanced computed tomography (CT) scans, nasopharyngeal swab polymerase chain reaction (PCR) panels, and serological tests for more than twelve pathogens. Systemic health was assessed through echocardiography, electrocardiogram (ECG), and abdominal ultrasonography for extrapulmonary involvement.

Results and their discussion. The clinical case involved a patient presenting with high fever and Grade 2 respiratory failure. Initial CT imaging revealed bilateral polysegmental inflammation with fibrotic-like changes and superior mediastinal darkening, which were severe enough to prompt an urgent oncology referral. However, comprehensive PCR testing was negative for common agents including Influenza, RSV, Mycoplasma pneumoniae, and Chlamydia pneumoniae, identifying HBoV as the sole pathogen. These findings align with Liao, J., et al. (2025) research indicating that HBoV independently causes severe pneumonia in approximately 5.88% of cases, with nearly 27.7% exhibiting lung consolidation. The pathogen is known to induce lung injury through pyroptosis and immune suppression by inhibiting type I interferon. Both, the clinical case and broader literature highlight significant systemic involvement, including myocardial dystrophy, hepatomegaly, and digestive system disorders, particularly in children aged 6 months to 2 years.

Conclusion. Human Bocavirus is a primary pathogen, which can cause severe pneumonia independently. The radiologic findings are complex and may mimic a malignancy or chronic fibrosis. It is associated with systemic inflammation and various extrapulmonary involvements. Hence, HBoV should be considered among differential diagnoses of pediatric pneumonia, particularly in cases with negative results from routine bacterial and viral panels.