

Case Report

## Human Bocavirus related lower respiratory tract infection in childhood: A case report

### Çocukluk çağında İnsan Bokavirüsün sebep olduğu alt solunum yolu enfeksiyonu: Bir olgu sunumu

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#### ABSTRACT

Human Bocavirus (HBoV) may cause lower respiratory infections (RTIs). In some studies, it is the third most common pathogen in children with lower respiratory tract infections. In this study, we report a 3 year-5 month-old age girl with fever, cough and rhinorrhea caused by HBoV. HBoV was detected in the patient whose nasopharyngeal aspirate (NPA) was tested by qualitative multiplex polymerase chain reaction (PCR), as her general condition worsened, a high-flow nasal cannula was applied, as well as intravenous antibiotics and inhaler drugs. Human bocavirus can be responsible as a viral agent in children with respiratory tract infections during fall and winter months. It should be kept in mind the use of the nasopharyngeal aspirates by qualitative multiplex PCR as a diagnostic test may enable more patients to be diagnosed.

**Keywords:** human bocavirus, lower respiratory tract infection, childhood

#### ÖZET

İnsan Bokavirüsü (HBoV) alt solunum yolu enfeksiyonlarına neden olabilir. Bazı çalışmalarda, alt solunum yolu enfeksiyonu olan çocuklarda en sık görülen üçüncü patojendir. Bu çalışmada, HBoV'nin neden olduğu ateş, öksürük ve burun akıntısı olan 3 yaş 5 aylık bir kız çocuğu sunulmuştur. Nazofarengal aspiratı (NPA) kalitatif multipleks polimeraz zincir reaksiyonu (PCR) ile test edilen hastada HBoV tespit edilmiş, genel durumunun kötüleşmesi üzerine intravenöz antibiyotik ve inhaler ilaçlar yanısıra, yüksek akımlı nazal kanül uygulanmıştır. İnsan bokavirüsü sonbahar ve kış aylarında çocuklarda solunum yolu enfeksiyonlarından sorumlu olabilen bir viral ajandır. Nazofarengal aspiratların kalitatif multipleks PCR ile tanı koydurucu olarak kullanılmasının daha fazla hastaya tanı konulmasını sağlayabileceği akılda tutulmalıdır.

**Keywords:** human bocavirus, pnömoni, alt solunum yolu enfeksiyonu

#### INTRODUCTION

Acute lower respiratory tract infections may cause significant morbidity and mortality in childhood. In resource-rich countries, the annual incidence of pneumonia is estimated to be 3.3 per 1000 in children younger than five years and 1.45 per 1000 in children 0 to 16 ye-

ars (1). A large number of microorganisms have been implicated as etiologic agents of pneumonia in children. Viruses are the most common etiology of common etiologic agents of pediatric community-acquired pne-

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umonia (CAP) in older infants and children younger than five years of age (1, 2).

The pathogenic role of *HBoV* is in the genus *Bocaparvovirus* of the virus family *Parvoviridae* in RTIs is uncertain because it was frequently detected in symptomatic and asymptomatic children and was commonly found with other viruses in symptomatic children (3).

## CASE REPORT

A 3 year-5 month-old age girl was admitted to our hospital on the seventh day of illness in March 2023. She presented with a history of rhinorrhea, cough and fever (axillary temperature 38.3°C).

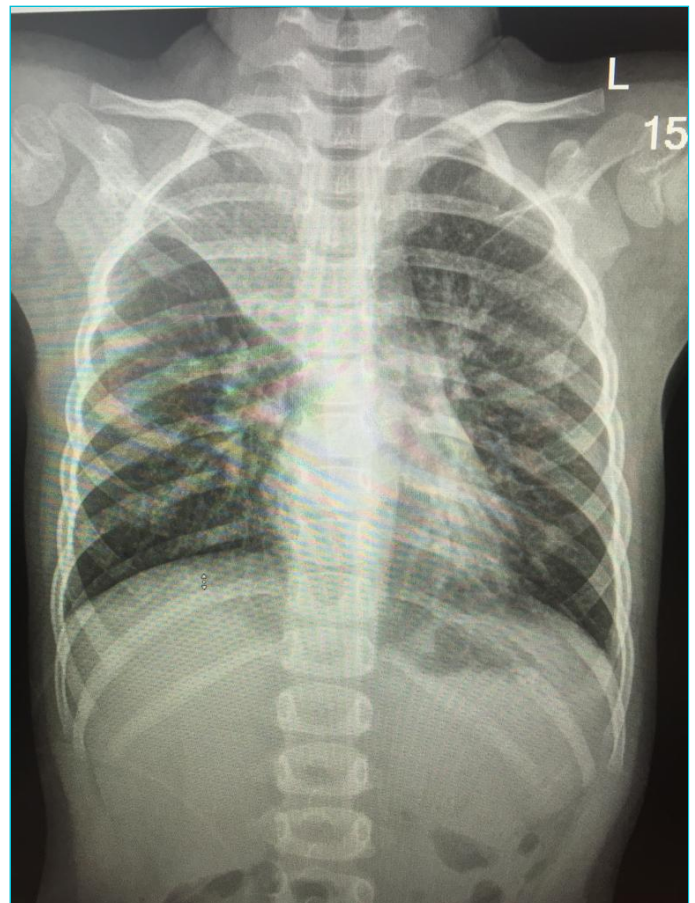
On admission, her respiratory rate was 40 breaths/minute (reference ranges: 21-29 breaths /minute), heart rate 156 beats per minute (reference ranges: 86-123 breaths/ minute), oxygen saturation 98% (with an oxygen flow of 4 liters/ minute using face mask), and the axillary temperature was 38.7°C. Auscultation of her lungs revealed bilateral crepitation and rhonchi with intercostal and subcostal retractions. There were no other signs on physical examination. Due to respiratory distress, a high-flow nasal oxygen cannula (HFNC) was applied.

The child had been born full-term as the second baby in the family. She had no known underlying illness or history of previous hospitalization. She had been fully immunized according to The National Vaccination Schedule.

Her white blood cell (WBC) count was  $11.3 \times 10^3/\mu\text{L}$  with 79.5% of granulocytes (in absolute numbers  $8.79 \times 10^3/\mu\text{L}$ ), hemoglobin 14.8 g/dL, and platelet count  $562 \times 10^3/\mu\text{L}$ . Her erythrocyte sedimentation rate was 36 mm/hour, and C-reactive protein (CRP) was 6.21 mg/L. Procalcitonin was 0.04 ng/ mL. When the patient's chest radiograph was analyzed, atelectasis and consolidation complex were observed in the right upper lobe (Figure 1). Lung ultrasonography revealed no pleural effusion.

At the time of admission, a nasopharyngeal aspirates (NPA) tested by qualitative multiplex PCR (QIAGEN QIAstat-Dx) was negative for *Adenovirus*, *Coronavirus 229E*, *Coronavirus HKU1*, *Coronavirus NL63*, *Coronavirus OC43*, *2019-nCoV*, *Human Metapneumovirus A+B*, *Influenza A*, *Influenza A H1*, *Influenza A H1N1 pdm09*, *Influenza A H3*, *Influenza B*, *Parainfluenza virus type 1-4*, *Respiratory Syncytial virus A+B*, *Rhinovirus/Enterovirus*, *Bordetella pertussis*, *Legionella pneumophila*, *Mycoplasma pneumoniae*. However, NPA was positive for *Bocavirus*.

Intravenous antibiotic treatment was administered because the patient's general condition had deteriorated; there was an atelectasis and consolidation complex in the right lung upper lobe and infiltration and secondary bacterial infection could not be ruled out. HFNC was applied for two days. After that, we started to use face mask oxygen treatment for three days. Although inhaled therapies have no place in the treatment of bronchiolitis, salbutamol, budesonide inhalations and intravenous methylprednisolone were given and pulmonary rehabilitation started. After starting these treatments, the symptoms and lung sounds improved. After seven days of hospitalization, she recovered completely from a *Bocavirus*-associated lower respiratory tract infection with the right upper lobe atelectasis and consolidation complex and was discharged.



**Figure 1.** Chest X-ray (anteroposterior view) of the patient of the first day of hospitalization before HFNC, showing the right upper lobe atelectasis and consolidation complex.

## DISCUSSION

Viruses are the most common cause of lower respiratory tract infections in childhood age group. They may be the primary factor in pneumonia, or accompany

bacterial pneumonia secondary to lower respiratory tract infections that start as bronchiolitis. In this report, we present a case of a 3.5 years old age girl with typical symptoms of lower respiratory tract infection and right upper lobe atelectasis and consolidation complex with positive PCR test for *Human Bocavirus*.

*HBoV* is commonly found in respiratory tract samples collected from hospitalized children with a peak age of up to 24 months (4). It appears as the third most common pathogen next to *RSV* and *rhinovirus* in young children presenting with acute bronchiolitis and wheezing by PCR (5,6). In recent years, many studies have shown that *Bocaviruses* also cause pneumonia in children (7).

Management of *HBoV*-associated respiratory infections primarily involves supportive care, focusing on alleviating symptoms and preventing complications. Antibiotics are not recommended unless a secondary bacterial infection is suspected. However, it is challenging to distinguish bacterial pneumonia from viral pneumonia because clinical signs and symptoms may overlap. Bacterial pneumonia has been associated with higher biomarkers for infection than viral pneumonia, while some studies have found no difference in biomarkers among bacterial and viral cases of pneumonia (8-10). Consequently, studies that report differences in these biomarkers cannot determine any reliable thresholds for differentiating bacterial pneumonia from viral pneumonia. Chest radiography is too insensitive to establish whether pneumonia is viral or bacterial aetiology. It is worth mentioning that the appearance of viral pneumonia on a chest X-ray may overlap with other types of pneumonia, including bacterial pneumonia. Therefore, the clinical context, symptoms, and additional diagnostic tests are crucial to make an accurate diagnosis., Ziemele et al. (7) recently described a case of *Human Bocavirus 1 (HBoV1)*-associated bronchiolitis and pneumonia. Interestingly, in this case, the right upper lobe infiltration was detected on the chest X-ray, similar to ours.

Although she had a positive PCR result, due to the general condition of the patient was poor at the time of admission, bacterial pneumonia could not be ruled out, so antibiotic treatment was started. Also, she was administered inhaler salbutamol and budesonide treatments, and treated with HFNC for two days. During the hospitalization, her general condition improved, auscultation of her lungs turned to normal, and she got well soon. Therefore, the patient was discharged on the seventh day of hospitalization.

## CONCLUSION

The incidence of *Human Bocavirus* as a viral agent may be higher in pneumonia and bronchiolitis seen in children during the fall and winter months. Screening children with lower respiratory tract with NPA test by qualitative multiplex PCR as a diagnostic test will help determine the causative agents and their incidence accurately.

### Patient Consent Form / Hasta Onam Formu

The parents' of this patient consent was obtained for this study.

### Conflict of Interest / Çıkar Çatışması

The authors declared no conflicts of interest with respect to authorship and/or publication of the article.

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