International Journal of Research in Medical Sciences
Singh VK et al. Int J Res Med Sci. 2023 Aug;11(8):3023-3025
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20232439

Case Report

Epstein Barr virus induced pneumonitis: a rare entity in immunocompetent baby

Vineet K. Singh[1], Manisha Verma[2], Yarraguntla K. Kumar[3], Mithlesh Bhargav[4]*

[1]Department of Pediatrics, Midland Health Care and Research Centre, Lucknow, Uttar Pradesh, India
[2]Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, Uttar Pradesh, India
[3]Department of Pediatrics, Churg District Hospital, Bhilai Nagar City, Chhattisgarh, India
[4]Department of Pathology, RML Pathology, Lucknow, Uttar Pradesh, India

Received: 22 May 2023
Revised: 15 June 2023
Accepted: 19 June 2023

***Correspondence:**
Dr. Mithlesh Bhargav,
E-mail: me.bhargav1119@gmail.com

ABSTRACT

Acute infectious interstitial pneumonitis (IP) (Epstein Barr virus (EBV)-associated IP) in children has been most commonly associated with human immunodeficiency virus (HIV) infection and immunocompromised hosts. Here we report a case of EBV-associated interstitial pneumonitis with cervical lymphadenopathy in an immunocompetent child. Patient underwent extensive routine and serologic workup which revealed positive polymerase chain reaction (PCR) for EBV, pointing towards the diagnosis of EBV induced pneumonitis. It is a very rare entity and is hardly seen among immunocompetent individuals especially young children. The aim of this case report is to bring to our notice that among all described pneumonias, EBV induced pneumonitis can be a possibility while dealing with lung infections.

Keywords: EBV, Immunocompetent child, Pneumonitis

INTRODUCTION

Epstein Barr virus (EBV) is one of the herpes viruses that is responsible for causing infectious mononucleosis, lymphomas and carcinomas primarily in immunocompromised individuals in adults. One of the rare pulmonary complications of EBV infection is pneumonitis in immunocompromised children.[1,2] We present one such case where an immune-competent child was found to have an EBV induced pneumonitis based on the serological evidence. After adding steroids to the standard treatment protocol, our patient showed clinico-radiological improvement.

CASE REPORT

A 6-year-old male child with height 115 cm and weight 20 kg (both between 50th and 75th percentile according to IAP growth chart) presented with history of fever, malaise followed by diffuse cervical lymphadenopathy for 5 days. On examination diffusely tender submandibular and lower jugular cervical lympnodes measuring 3×2.5 cm were noted on left side. They were not fixed to underlying structures and were freely mobile. General as well as systemic examination was unremarkable. On investigating complete blood count showed leucocytosis with lymphocytosis while liver function test (LFT) showed mildly elevated serum glutamic-oxaloacetic transaminase (SGOT), serum glutamic-pyruvic transaminase (SGPT) and mild hyperbilirubinemia.

On 7th day of pyrexia of unknown origin fine needle aspiration cytology (FNAC) was done, later in the evening patient developed mild difficulty in breathing for which baby was admitted on our side. Respiratory examination showed increased respiratory rate and bronchial sounds along with bilateral fine crepts were heard. Patient was hypoxic with oxygen saturation of 87% on room air which

improved to 92% on 3 L (L) nasal cannula (NC). Hematological parameters showed similar findings, but in addition few reactive lymphocytes were also noted in the peripheral smear (Figure 2a). Liver function test were deranged and showed raised SGOT-556 U/l and SGPT-447 U/l which were in accordance with previous reading. Total bilirubin was also increased (2.5 g/dl). Rheumatologic panel and additional infectious workup revealed absence of lupus anticoagulant antibody and anti-beta-2-glycoprotein antibody. Blood and sputum culture was negative. Viral markers were also negative. Chest X-ray showed bilateral infiltrates (Figure 1).

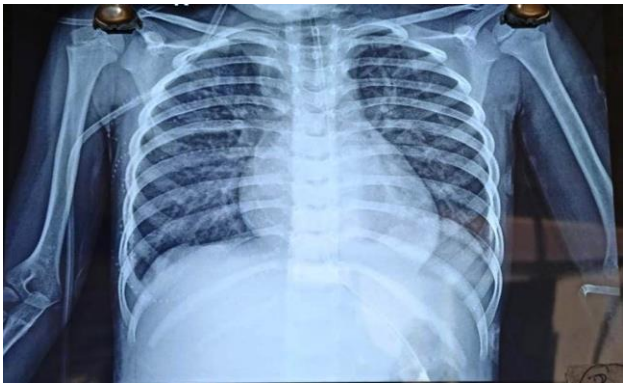

Figure 1: X ray demonstrates diffuse and heterogenous infiltrates in entire bilateral lung fields.

FNAC of lymphnodes displayed reactive lymphoid hyperplasia with prominent hemophagocytosis and emperiolesis (Figure 2b-d).

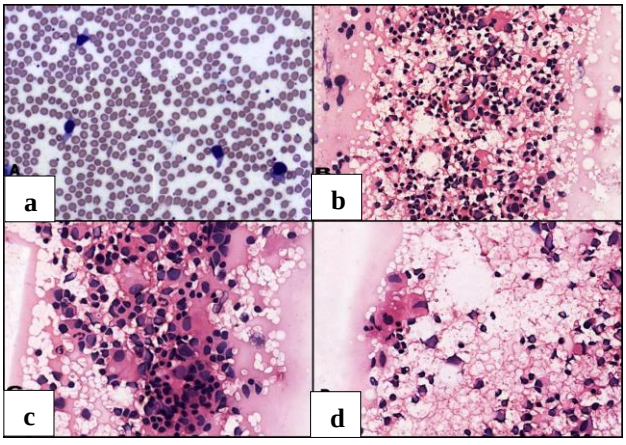

Figure 2: (a) PBS smear shows few reactive lymphocytes (40x Leishman stain), (b) lymph node aspirate displaying reactive lymphoid hyperplasia (10x H and E stain), (c) section shows polymorphous population of lymphoid cells (40x H and E stain), and (d) section show prominent hemophagocytosis (40x H and E stain).

Upon suspecting insterstitial pneumonitis or community acquired pneumonia, patient was started on IV ceftriaxone, vancomycin and azithromycin, but there was no improvement. The sample was simultaneously sent for viral PCR (CMV and EBV) which came positive with high viral load for EBV after 4 days. Thus IV steroids were added after correlating with the PCR report and the patient showed significant improvement. Patient was followed in the outpatient department 10 days after being discharged from hospital. Repeat X-ray showed complete resolution of the pulmonary infiltrates which were seen previously.

DISCUSSION

Infectious mononucleosis (IM), caused by EBV, has been recognised as a clinical syndrome consisting of a triad of fever, tonsillar pharyngitis and lymphadenopathy.[3] Patients with IM can also present different skin manifestations or atypical exanthemas, most commonly the pruritic maculopapular rash in patients receiving β-lactam antibiotics. Symptomatic infection with EBV is more likely to occur in adolescent and adult years, while primary EBV infections in children are often asymptomatic. Some data suggest that older patients are more susceptible to develop a more severe clinical condition.[4] In addition, patients may also develop EBV-positive diffuse large B cell non-Hodgkin lymphoma, which has a poor prognosis and necessitates early diagnosis and treatment. EBV is also found to be associated not only with nasopharyngeal carcinoma, but also with oral and oropharyngeal squamous cell carcinomas. EBV can affect virtually any organ system and has been associated with different disease manifestations such as hepatitis or cholestasis, jaundice, hepatomegaly, pneumonia, pleural effusions and pancreatitis.[5] Herein, we present a case of an immunocompetent child who developed respiratory distress due to EBV pneumonitis without the suggestive clinical manifestations of IM. Lung involvement is rare with EBV infection and is more commonly observed in immunosuppressed patients, but can also be seen in immunocompetent patients.[6]

Pulmonary manifestations associated with EBV infections have been described in the literature more commonly as lymphadenopathy (frequently hilar and mediastinal lymphadenopathy), pleural effusions, and interstitial pneumonitis. Two proposed mechanism for the interstitial edema includes accumulation of the virus secondary to rapid viral replication versus the body's own immune reaction to the infection or a combination of both.[4-6] It is characterized radiologically by bilateral lower lobe infiltrates, and histologically by a polymorphic lymphoplasmacytic cell infiltration of the pulmonary interstitium. In cases where early antiviral therapy is initiated, early recovery from the disease is noted with early resolution of interstitial infiltrates on chest X-ray. Few reports have mentioned use of antiviral agents like acyclovir however its efficacy is still doubtful and usage is clinically not indicated. Although few reports have favoured acyclovir in EBV associated pneumonitis but no single antiviral agent has precedence over others.[7] In cases where the diagnosis is delayed, steroids or

immunoglobulins have been successful in subsiding the immune reaction leading to rapid recovery of the symptoms. As to the best of our knowledge, one case has been reported in literature where diffuse EBV induced pneumonitis in an infant was successfully treated with inhaled and systemic steroids without use of antiviral drugs.[8] Frequently acute EBV infection can be associated with antiphospholipid antibodies, which in our case were absent.

CONCLUSION

Lung involvement following EBV infection in a child is considered one the rarest manifestations of the infection with a high risk of mortality. This case presents an uncommon scenario of EBV-induced acute interstitial pneumonitis in an immunocompetent young child. The clinical presentation was atypical and the patient needed prompt intervention. It was successfully treated with IV antibiotics followed by steroids, which resulted in a satisfactory outcome.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Teirstein AS, Rosen MJ. Lymphocytic interstitial pneumonitis. Clin Chest Med. 1988;9:467-71.
2. Katz BZ, Beckman AB, Shapiro ED. Serologic evidence of active Epstein-Barr virus infection in Epstein-Barr virus associated lymphoproliferative disorders of children with acquired immunodeficiency syndrome. J Pediatr. 1992;120:228-32.
3. Fugl A, Andersen CL. Epstein-Barr virus and its association with disease - a review of relevance to general practice. BMC Fam Pract. 2019;20(1):62.
4. Dunmire SK, Hogquist KA, Balfour HH. Infectious Mononucleosis. Curr Top Microbiol Immunol. 2015;390(Pt 1):211-40.
5. Khoo A. Acute cholestatic hepatitis induced by Epstein-Barr virus infection in an adult: a case report. J Med Case Rep. 2016;10:75.
6. Odumade OA, Hogquist KA, Balfour HH. Progress and problems in understanding and managing primary Epstein-Barr virus infections. Clin Microbiol Rev. 2011;24(1):193-209.
7. Kimura H. Pathogenesis of chronic active Epstein-Barr virus infection: is this an infectious disease, lymphoproliferative disorder, or immunodeficiency? Rev Med Virol. 2006;16(4):251-61.
8. Ankermann T, Claviez A, Wagner HJ, Krams M, Riedel F. Chronic interstitial lung disease with lung fibrosis in a girl: uncommon sequelae of Epstein-Barr virus infection. Pediatr Pulmonol. 2003;35:234-8.

Cite this article as: Singh VK, Verma M, Kumar YK, Bhargav M. Epstein Barr virus induced pneumonitis: a rare entity in immunocompetent baby. Int J Res Med Sci 2023;11:3023-5.