Turk Thorac J 2020; 21(1): 69-72 DOI: 10.5152/TurkThoracJ.2019.18005

Case Report

An Index Case of Diffuse Alveolar Hemorrhage Secondary to Chikungunya

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Cite this article as: Ahmed SZ, Ahmed Z, Mukhtar KN, et al. An Index Case of Diffuse Alveolar Hemorrhage Secondary to Chikungunya. Turk Thorac J 2020; 21(1): 69-72.

Abstract

Chikungunya virus (CHIKV) is an alphavirus transmitted by mosquitoes, mostly by *Aedes aegypti* and *Aedes albopictus*. It is starting to become a very common entity in Pakistan, with a wide range of clinical manifestations. Here we report a case of a young male with CHIKV who presented with a clinical manifestation of diffuse alveolar hemorrhage which has not been observed so far in a patient suffering from this illness.

KEYWORDS: Alveoli, Chikungunya, diffuse alveolar hemorrhage, hemorrhage

Received: *28.01.2019* ***Accepted:*** *30.07.2019*

INTRODUCTION

Chikungunya is transmitted by *Aedes* spp. mosquitoes [1]. Infection with Chikungunya virus (CHIKV) can present in different ways, including fever, rash, lassitude, exhaustion, and joint pain [2]. Joint pain can be very significant and, in some cases, has been known to last for months [3]. Respiratory manifestations, such as pneumonia and acute respiratory distress syndrome, are unusual with Chikungunya fever [4]. Here, we report an index case of diffuse alveolar hemorrhage (DAH) encountered in a patient suffering from CHIKV.

CASE PRESENTATION

A 28-year-old healthy male patient previously presented to the emergency department in April 2017 with symptoms of fever and shortness of breath that started 3 days before admission and hemoptysis from the morning of the day of admission. He described his fever as high grade, intermittent, associated with generalized body aches. He also gave a history of hemoptysis (small amounts of fresh blood) since the morning of admission and especially when he had bouts of cough. At the time of presentation in the emergency department, the patient was found to be pyrexial, his temperature was noted to be 36.9°C, his heart rate was normal at 72 beats/min, he was tachypneic, his respiratory rate was 32 breaths/min, his blood pressure was 100/64 mmHg, and he was hypoxic with an oxygen saturation of 88% on room air. On examination, he also looked dehydrated.

On chest auscultation, there was bilateral basal crepitation, more on the right side. Examination of the cardiac system revealed a heart rate of 72 beats/min which was regular. The jugular pressure looked normal, first and second heart sounds were audible with no added sounds, and there was no peripheral edema. Abdominal examination was unremarkable. Examination of the musculoskeletal system was also normal.

His laboratory work-up was as follows: white blood cell 10×10^9/L, hemoglobin 16.5 g/dL, hematocrit 47, platelet count 153×10^9/L, prothrombin time 13 s, and international normalized ratio 1.3. Serum biochemistry showed sodium 145 mEq/mL and potassium 4.2 mEq/mL. Blood urea nitrogen and creatinine were 33 mg/dL and 1.6 mg/dL, respectively. Erythrocyte sedimentation rate was 07 mm. C-reactive protein was 10.0 mg/L. Liver function tests were within the normal limits.

Subsequent blood culture, sputum culture, and urinalysis were normal. Initial chest radiographs showed diffuse bilateral cotton wool type shadowing (Figure 1). Chest X-ray (CXR) was suggestive of bilateral pneumonia, DAH, and heart failure. High-resolution computed tomography of the chest was performed (Figure 2a-d) and showed that minimal bilateral pleural effusion is seen more on the right side. Patchy areas of fluffy alveolar opacities are seen in both lungs and perihilar region with sparing of subpleural space. Findings are most likely due to pulmonary alveolar hemorrhages with superadded pulmonary infection.

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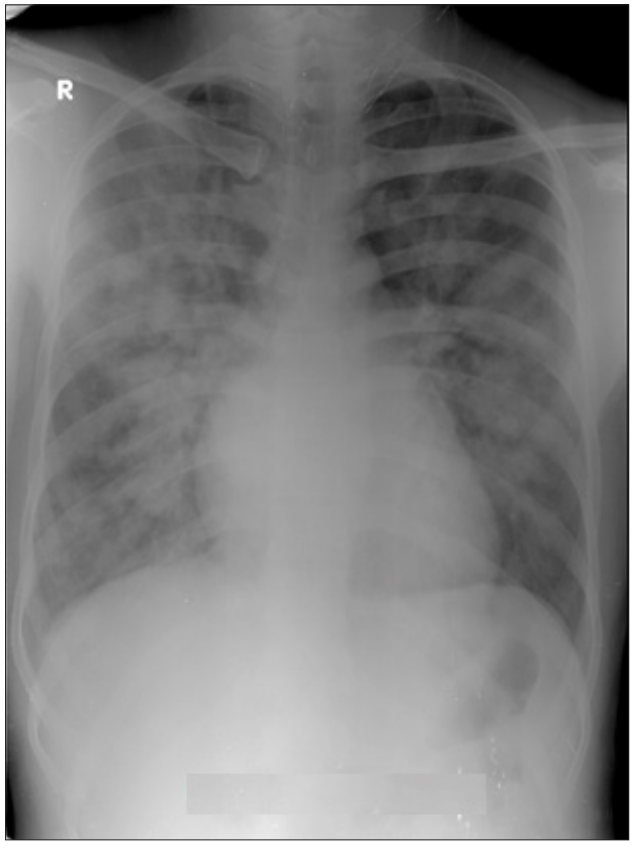

Figure 1. Posteroanterior chest X-rays showing diffuse bilateral cotton wool type shadowing

His radiology was suggestive of diffuse pneumonia/pulmonary edema or DAH.

His presentation and investigation results made the diagnosis of pneumonia or pulmonary edema very unlikely, and he was managed as a case of DAH. With the clinical diagnosis of DAH, we investigated to establish the cause leading to this diagnosis. Laboratory work-up showed that his serum complement level (C3=94 (88-252 mg/dL) and C4=52 (12-75 mg/dL)) was normal. C-ANCA and P-ANCA were within normal limits at 0.74 and 0.29, respectively, and additional dengue NS1 antigen was done which also was negative. As the patient kept on giving a history of viral illness in the family and every one having joint aches, a Chikungunya antibody test was performed that showed IgM positive and IgG negative results.

MAIN POINTS

- Chikungunya a quickly common becoming entity in many countries,with a variety of clinical manifestations.
- Any patient with productive cough or hemoptysis should be worked up with related radiological testing to look for any signs of Alveolar hemorraghe or any other parenchymal involvement of the lung.
- Prompt therapy with immunosuppresants is a must for quick recovery from the situation.

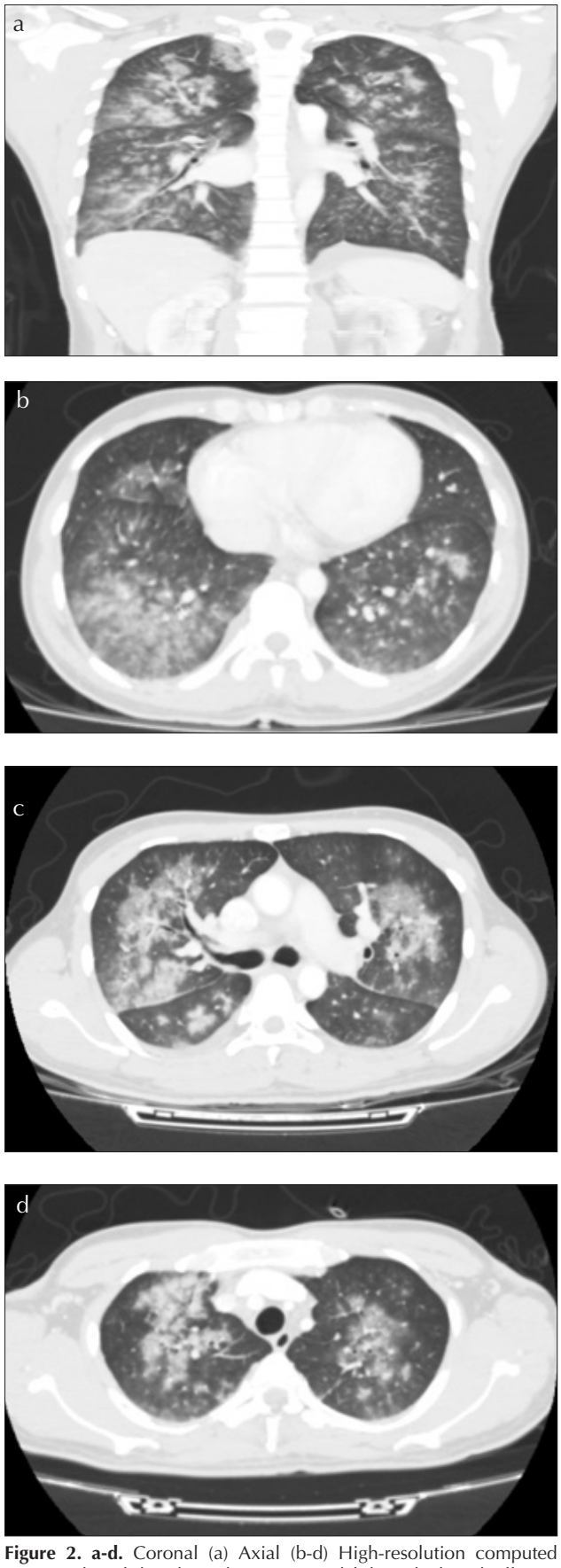

Figure 2. a-d. Coronal (a) Axial (b-d) High-resolution computed tomography of the chest shows minimal bilateral pleural effusion seen more on the right side. Patchy areas of fluffy alveolar opacities are seen in both lungs and perihilar region with sparing of subpleural space

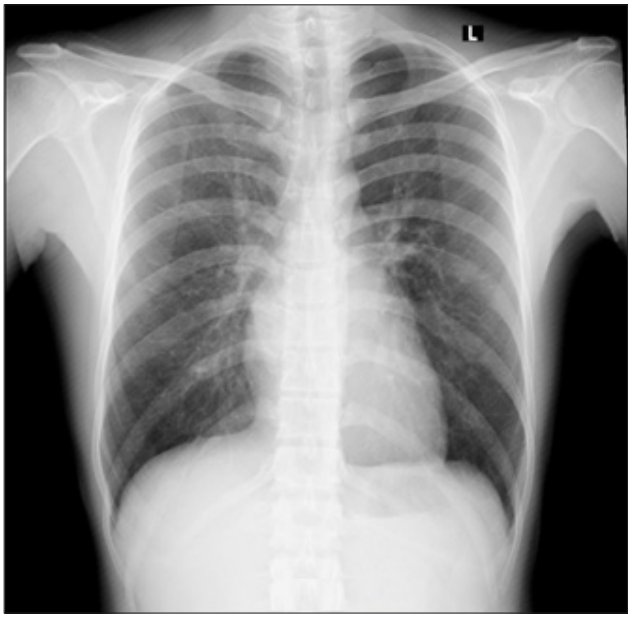

Figure 3. Posteroanterior chest X-rays showing marked clearing of bilateral shadows

During hospitalization, the patient was hydrated and given treatment for hemoptysis. Treatment given was tranexamic acid (Transamin; Hilton, Karachi, Pakistan) at initially 1 g BD then tapered to 500 g BD tablet. Patient was later started on treatment for DAH, and pulse therapy was commenced on high dose of methylprednisolone (Solu-Medrol; Pfizer, Karachi, Pakistan) 500 mg OD and then azathioprine (Imuran; GlaxoSmithKline, Karachi, Pakistan) 50 mg BD. He has responded very well to the treatment and was completely weaned off oxygen support within 4 days, and his hemoptysis also stopped. His repeat CXR on day 9 of admission (Figure 3) showed a marked clearing of bilateral shadows. On follow-up, a repeat serology of CHIKV showed IgG antibody positivity.

Written informed consent was obtained from the patient for publication.

DISCUSSION

It has been >60 years since CHIKV was found to cause human disease. However, it was more widely recognized when there was an outbreak in 2004 in Kenya, then others have been reported from several islands of the Indian Ocean and also from India [5]. CHIKV usually presents in two phases, acute phase and chronic phase. In the acute phase, the patient usually presents with fever (usually >39°C) [6]. The main clinical symptoms mentioned by Robinson [7] in his original report were fever, disabling joint pain, muscle pain, headache, and generalized maculopapular rash. In addition, gastrointestinal upset resulting in vomiting was mentioned. Joint pain can also persist for a long duration. Hemorrhagic signs have also been reported [8-10]. Very rarely, it can be associated with hepatitis, meningitis, and encephalitis [11,12]. Various cardiovascular manifestations, such as myocarditis, arrhythmias, and congestive insufficiency, can be seen in Chikungunya fever [13,14]. Chronic stage of Chikungunya is mostly characterized by polyarthralgia that can last from weeks to years beyond the acute stage which can lead to disability.

Diagnosis can be established by various methods. Serological tests, such as enzyme-linked immunosorbent assays, may confirm the presence of IgM and IgG anti-Chikungunya antibodies. IgM antibody levels are highest 3-5 weeks after the onset of illness and persist for approximately 2 months. Samples collected during the first week after the onset of symptoms should be tested by both serological and virological methods (reverse transcription polymerase chain reaction) for prompt detection of the virus [15].

To our knowledge, DAH has never been reported with Chikungunya viral infection. There was no other pertaining factor that might have caused the complication in this patient. Thus, we assume that this was an effect induced by the virus itself or an idiopathic reaction to it. Moreover, this complication was only seen in this patient, whereas his other family members were affected by the same illness but only showed typical presentation of arthralgia. Furthermore, the patient responded well to the treatment usually given for DAH and is still on follow-up. His immunosuppressive treatments have been tapered off.

Informed Consent: Written informed consent was obtained from the patient for publication.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - S.Z.A.; Design - S.Z.A., Z.A.; Supervision - Z.A.; Data Collection and/or Processing - S.Z.A., Z.A.; Analysis and/or Interpretation - Z.A., K.N.M., S.A.A.; Literature Search - A.A., K.N.M.; Writing Manuscript - S.Z.A.; Critical Review - S.A.A., Z.A., K.N.M.

Conflict of Interest: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

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