CASE REPORT

Dengue Hemorrhagic Fever with Pulmonary Complication in a Foreigner: A Case Report with a Brief Review of the Literature

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Abstract

Dengue fever (DF) is a prevalent arboviral illness in developing nations. Pulmonary manifestation in dengue is mainly due to involvement of the upper airway; however, in severe forms, the lower respiratory tract may involve resulting in diffuse alveolar hemorrhage.[1] Here, we present a case report of a young female who presented in the stage of dengue hemorrhagic fever (DHF). The high-resolution computed tomographic (HRCT) study revealed bilateral and symmetrical ground glass opacities (GGO) involving perihilar regions and upper lobes of the lungs. The lung findings add to the complications of DHF.

Keywords: Dengue, Hemorrhagic shock, Pulmonary edema.

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Introduction

Dengue fever (DF) is an acute viral disease that is widespread in developing countries. The disease is spread by the bite of the *Aedes aegypti* mosquito. The World Health Organization (WHO) categorized this illness as DF, DHF, or dengue shock syndrome (DSS). A recent revision was made to the original classification system in the year 2009, where the distinction was made mainly on the presence or absence of complications. However, the older classification is commonly used for the purpose of diagnosis and management. Four serotypes of dengue have been documented till now, which are DEN-1, DEN-2, DEN-3, and DEN-4.[2] According to WHO surveys, the incidence of dengue has increased thirty times in the last few decades.[3] This disease is commonly associated with multiple life-threatening complications like acute liver failure, myocarditis, pneumonitis, and Guillain–Barre like syndrome. The symptoms include a history of fever along with severe body pains and aches, also called break bone pain, along with dyspnea also starts due to fluid in the lungs after capillary leakage. The respiratory symptoms also may occur due to pulmonary hemorrhage, often leading to diffuse alveolar hemorrhage (DAH) and hemothorax. DAH can also occur without hemoptysis in approximately 40% of cases.[4] The main aim of this case report was to throw light on pulmonary involvement as a complication of DSS. Written informed consent for the publication was obtained from the patient.

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Case Description

A 23-year-old female (Spanish visitor) presented to the emergency department with complaints of headache, fever, hemoptysis, hematemesis, and shortness of breath for 4 days. The patient had a continuous high-grade fever and one episode of syncope. Antigen testing led to the diagnosis of DF in the emergency medicine department, where conservative and supportive care was administered. Dengue serology was confirmed by nonstructural protein 1 and IgM enzyme-linked immunosorbent assay. She gave a history of heavy menstrual

bleeding for 4 days and bouts of cough with blood in the sputum around four to five episodes/hour. She became irritable, dyspneic, pale, and was shifted to the intensive care unit (ICU). Her heart rate was 106/minute and she maintained a blood pressure of 81/61 mm Hg with noradrenaline support. In view of severe dyspnea, she was intubated and kept on mechanical ventilation. The patient was kept on infusion fentanyl and atracurium for 24 hours. On chest auscultation, bilateral basal fine crepitations were present. Laboratory investigations revealed a platelet count of 20,000/mm^3 and hemoglobin of 12 gm/dL. Hematocrit value was 43.7%, serum creatinine was 0.77 mg/dL, serum urea 26.3 mg/dL, and serum sodium 135.58 mEq/dL. Serum bilirubin (direct/indirect (0.09/0.39) and serum albumin of 5.64, serum globulin 2.28, prothrombin time and International Normalized Ratio was 14.1 seconds/1.09, respectively.

Arterial blood gas analysis showed metabolic acidosis. Chest radiology revealed multiple bilateral opacities. The patient also underwent a high-resolution computed tomographic (HRCT) scan of the thorax, which revealed bilateral symmetrical GGO involving perihilar regions and upper lobes. Bilateral mild pleural effusion with collapse-consolidation of both lower lobes was reported. The patient received a single donor platelet transfusion, after which counts improved to a value of 1.35 lakhs gradually to 2.08. She was weaned off from the ventilator, ambulated, and shifted after 1 week of ICU stay.

Discussion

Dengue infection is divided into three phases after a short incubation period—(1) a febrile phase, (2) a critical phase associated with remission of fever, and (3) a final recovery phase. The phase of hemorrhagic fever includes elevated liver enzymes, thrombocytopenia, and symptoms of plasma leakage. DHF is presented as a late complication of DF due to increased capillary permeability and bleeding tendencies. Plasma leakage has generally been attributed to a mediator-related change in endothelial function.[5] Usually, patients present with petechiae, epistaxis, and gingival bleeding followed by major bleeding from the gastrointestinal or respiratory tract. Laboratory confirmation is used to establish the diagnosis of dengue virus infection instead of merely relying on clinical signs. Our patient fulfilled the requirements for DSS, according to WHO recommendations. The presence of high-grade fever and positive tourniquet test indicated a diagnosis of DF, which was confirmed with laboratory findings. A negative tourniquet test does not completely rule out the diagnosis of DF. The increased capillary permeability causes fluid extravasations presenting as pleural effusion and ascites. However, hemoptysis has been reported in 1.4% of patients.[6] These bleeding manifestations lead to thrombocytopenia along with a fall in hematocrit. Massive and multiple bleeding episodes lead the patient to a state of shock. Since our patient had multiple episodes of hemoptysis along with effusion, so she had to be intubated for positive pressure ventilation. The treatment of dengue fever mostly includes symptomatic measures and platelet transfusion as a whole. With adequate supportive therapy, mortality might be decreased to 1%.[7] The only report of the HRCT findings that could be identified in the literature mentions the existence of discrete patchy GGO in both lungs, which underwent regression following conservative therapy.[8] DAH is a syndrome caused by diffuse bleeding into the acinar region of the lung. The acute anomalies seen in DAH correspond to patchy GGO without a noticeable thickening of the interlobular septum on computed tomographic (CT). An interlobular and intralobular interstitial thickening appears in the subacute period, usually within 48 hours. A thorough analysis of DF lung involvement and CT imaging results was performed by Rodrigues et al.[9] They claim that 58.6% of patients who underwent a chest CT showed abnormalities. Pleural effusion was seen in 55% of those individuals and was the only abnormality found in 35% of the patients.[9]

Recently, a case of large unilateral (right-sided) hemothorax was reported.[10] Pleural effusion may be bloody. In 27.5% of patients, the GGO was the most common finding of lung parenchymal involvement, followed by lung consolidation in 20.6% of patients. In 6.82% of patients, interlobar septal thickening and airspace nodules with no specific distribution were detected. Reports from Venezuela also showed similar findings; lung diseases (noncardiogenic pulmonary edema, diffuse alveolar damage, thromboembolism, bronchopneumonia, pneumonitis, and hemorrhage) were the cause of death in two-thirds of dengue death cases.[11] Report from Yunnan showed that 38.6% of severe dengue cases presented pleural effusion due to plasma leakage.[12]

Conclusion

To conclude, fever associated with thrombocytopenia indicates a diagnosis of DF in a country where it is endemic, but all other causes of infectious fever should be ruled out. Also, timely diagnosis and correct replacement with fluids and blood products can treat this life-threatening infectious disease. DHF high-resolution CT findings comprise bilateral GGO and pleural effusion.

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