Case Report

Zika Virus-Associated Respiratory Tract Infection: A Rare Clinical Scenario

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ABSTRACT

Introduction:

The Zika virus, a flavivirus carried by arthropods, is mainly linked to febrile disease, rash, and neurological problems. Respiratory involvement, particularly hypoxemic respiratory failure with pneumonitis, is a rare presentation of Zika virus infection.

Case Presentation:

We describe a 70-year-old male Bangladeshi patient who had a history of hypertension presented with 10-day history of low-grade fever, myalgia, joint pain, and generalised weakness. Initial investigations, including complete blood count, blood cultures, and Dengue IgM antibody, were unremarkable. However, Zika virus RNA was detected via reverse transcriptase polymerase chain reaction (RT-PCR) from a blood sample. But the patient developed shortness of breath and chest pain on second day of hospitalization, later he was sent to the critical care unit after developing hypoxemia. Imaging showed a right-sided basal consolidation and a small pleural effusion, both of which are indicative of pneumonitis. Sputum culture and respiratory panel RT-PCR were negative for bacterial and viral pathogens. He was managed with high-flow nasal oxygen and intravenous antibiotics, resulting in significant clinical improvement.

Conclusion:

While pulmonary manifestations are well-documented in flaviviruses like dengue, Zika virus-induced pneumonitis is rare with few case mentioned in the literature. Particularly in endemic areas, clinicians should keep a close eye out for Zika virus infections in febrile diseases with unusual respiratory presentations.

Keywords: *Zika virus, respiratory involvement, atypical presentation, pneumonitis*

INTRODUCTION

A flavivirus, the Zika virus (ZIKV), is carried by mosquitoes and shares similar features with other flavivirus like dengue, yellow fever, and West Nile virus[1,2]. About 20% of patients experience clinical signs of Zika virus infection, which include low-grade fever, arthralgia, conjunctivitis, and a maculopapular pruritic rash. Although most infections are asymptomatic, the Zika virus has been linked to severe thrombocytopenia, Guillain-Barré syndrome, and other congenital brain diseases, as well as other adverse pregnancy outcomes[3]. The Zika virus has caused hypoxemic respiratory failure in rare instances [4,5], and the incidence of pneumonia secondary due to ZIKV was mentioned in the literature in only few instances[6].

CASE SUMMARY

A 70-year-old Bangladeshi hypertensive, non-diabetic male was admitted into Evercare Hospital Dhaka with the complaints of fever for 10 days which was low grade in nature initially, not

associated with chills and rigors, without any diurnal variation. But his fever became high grade in nature for preceding 3 days and highest temperature recorded was 103°F. He also had body ache, joint pain, loss of appetite and generalized weakness. He didn't have any joint pain, redness of eye, cough, chest pain, shortness of breath back then.

At the time of his admission his pulse was 78 beats/min, temperature 98°F, blood pressure of 100/70 mm Hg, respiratory rate of 20 breaths/minute, oxygen saturation was 98% in room air, a vesicular breath without any additional sound, and a soft, non-tender abdomen without organomegaly. But one day after his admission, he developed shortness of breath as well as a fall in oxygen saturation for which he was shifted to critical care unit.

Initial investigations including complete blood count, Dengue antibody IgM (ELISA), X ray chest, urine profile was unremarkable except for raised CRP (6.1 mg/dl). But further investigations lead to positive ZIKV detected on RT-PCR of blood sample. His blood culture and urine culture, liver function test and renal function test were normal.

After shifting to critical care unit screening ultrasound revealed mild pleural effusion and basal consolidation on right side of chest and x ray chest showed features of pneumonitis (figure 01 and 02)

His CRP rose to 11.2 mg/dl, but there was no significant alteration of complete blood count and his respiratory panel PCR from nasal swab was negative for common bacterial and viral pathogen. Therefore, he was treated as ZIKV-induced hypoxic respiratory failure with pneumonitis with oxygen via high flow nasal cannula and intravenous antibiotics including injection meropenem three times daily.

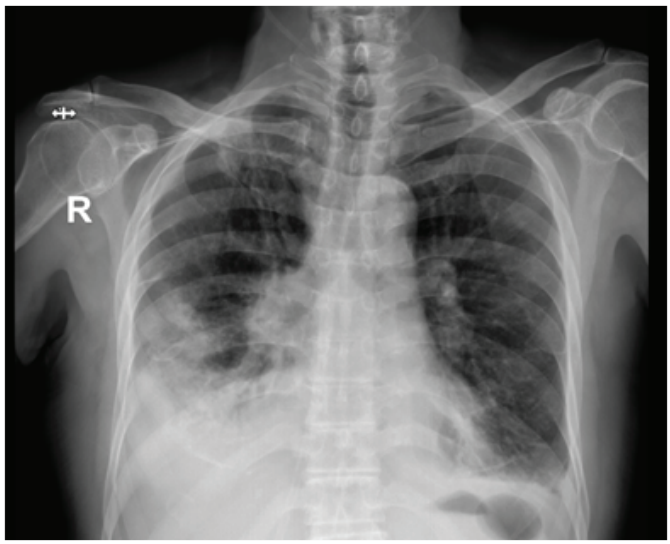

Figure 1: Chest x ray showing opacity in right lower part

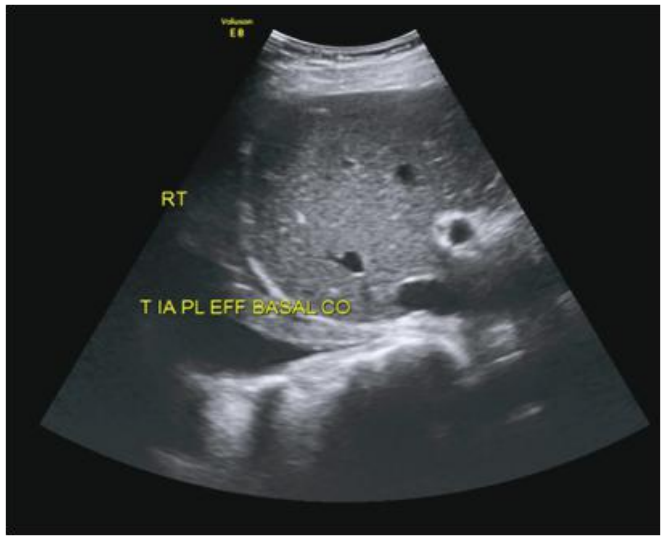

Figure 2: Screening ultrasound of chest showing effusion and basal consolidation of right side of chest

On subsequent days of his hospitalization, patient had significant clinical recovery with the improvements of radiological shadow, CRP, and NT pro-BNP (table 01). He was discharged on 14th day of his illness with stable hemodynamics.

DISCUSSION

First discovered in 1947 in Ugandan sentinel rhesus macaque monkeys, ZIKV was first linked to human illness in 1952[7]. The two main lineages of the virus have historically been found in South-East Asia and Africa. ZIKV is a single-stranded RNA virus, from Flaviviruses family and shares similarities with other vector-borne illnesses, especially dengue and chikungunya, in terms of epidemiology and transmission cycles[8]. Aedes mosquitoes have the potential of carrying and spreading ZIKV, and A. aegypti and A. albopictus are recognized as key vectors in human transmission[9].

The neurotropic and teratogenic potential of Zika virus infection is well known; commonly causes

Table 01: Investigation reports initial and during discharge

Investigation	Initial report	During discharge	Reference range
Hemoglobin	10.8 gm/dl	13.9 gm/dl	13.5-17.5 gm/dl
White blood cell	6.70×109/L	8.75×109/L	4-11×109/L
Neutrophil	79.90%	68.20%	40-80%
Lymphocyte	16.70%	22.30%	20-40%
Monocyte	2.80%	6.90%	2-8%
Platelet	125×109/L	254×109/L	(150-400) ×109/L
ESR	47 mm		(0-10) mm in 1st hour
S. creatinine	1.05 mg/dl	1.02 mg/dl	
Dengue virus antibody IgM	0.13		Negative:<1.00 AU/mL Positive:>1.00
CRP	11.20 mg/dl	2.66 mg/dl	<0.37 mg/dl
Urine profile			
RBC	Occasional		
Pus cell	1-3/ HPF		
Cast	Nil		
Chikungunya/Dengue/ZIKA/ Yellow fever /West Nile virus RT PCR	ZIKA virus detected		
Respiratory panel PCR	Not detected		
Sputum aerobic culture	No growth		
Blood culture	No growth		
NT-pro BNP	6176 pg/ml	716 pg/ml	<125 pg/ml
Liver function test			
Bilirubin	1.3 mg/dl		0-1 mg/dl
ALT(SGPT)	26 IU/L		<50 IU/L
AST(SGOT)	31 IU/L		<31 IU/L
Alkaline phosphatase	57 IU/L		IU/L
GGT	35 IU/L		IU/L
Total protein	6.3 gm/dl		gm/dl
Albumin	2.4 gm/dl		gm/dl
Troponin	67.8 ng/L		Male: <34.2 ng/L
Female:<15.6 ng/L			
Serum electrolyte			
Sodium	132 mmol/L	131 mmol/L	
Potassium	3.9 mmol/L	4.7 mmol/L	
Chloride	100 mmol/L	96 mmol/L	
Bicarbonate	28 mmol/L	29 mmol/L	
Screening ultrasound	Mild pleural effusion (R) and basal consolidation (R) Ejection fraction:60%		
Echocardiogram	Aortic sclerosis, no regional wall motion abnormality		

Guillain-Barré syndrome and microcephaly in adults and newborns, respectively[10]. However, emerging reports indicate that Zika virus can also cause organ-specific manifestations beyond its classic presentation[11]. Respiratory involvement, though rare, is a plausible complication of Zika virus infection, few reports have mentioned, most of them involving upper respiratory tract infection[12]. Although there is no documented data on ZIKA infection, other flavi virus family members, such as dengue, have demonstrated pulmonary manifestations such as pleural effusion, pulmonary haemorrhage, pneumonitis, acute respiratory distress syndrome [13,14].

While no specific antiviral treatment exists for Zika virus, supportive care, such as oxygen supplementation and hydration, is essential during treatment of respiratory tract infection.

CONCLUSION

Zika virus infection manifesting hypoxemic respiratory failure with pneumonitis, a rare but clinically significant presentation. While respiratory involvement is not a common feature of Zika virus infection, this report highlights the need for clinicians to consider Zika virus as a differential diagnosis in febrile illnesses accompanied by respiratory symptoms, particularly in endemic regions.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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ETHICAL APPROVAL

The authors informed written consent from the patient to publish this case report.

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