Case Reports

Concurrent mosquito-borne triple infections of dengue, malaria and chikungunya: A case report

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Dengue, malaria and chikungunya are important mosquito-borne diseases and endemic in India. Each of these diseases contribute substantially to the morbidity, if not diagnosed and managed at an earliest. The clinical features common to all the three diseases are prolonged fever, backache, joint pain, rash, headache, running nose and epistaxis causing challenge in diagnostic segregation based on the symptoms alone. Coinfections with dengue and chikungunya have been reported in literature; however, triple infections are very rare. In India, the first case of concurrent infections with dengue, chikungunya and malaria was published by Hati et al. in 2016. We report here, a second case of concurrent infections with dengue, malaria and chikungunya in a 55-yr-old male patient from India.

Case Report

A 55-yr-old male patient from Haryana state was admitted in the Balaji Action Hospital, New Delhi with complaints of fever, body pain, headache, vomiting, oral ulcers, breathlessness, anxiety and chest pain for past five days. On general physical examination, patient was conscious, self-oriented but lethargic with no hepatosplenomegaly. The laboratory investigations done on the day of admission revealed haemoglobin–15.9 mg/dl; total leucocyte count of 23.3×10⁹/l; platelet count–83×10⁹/l; C-reactive protein–3.9 mg/dl; serum aspartate transaminase–195 IU/L; serum alanine transaminase 176 IU/L; serum calcium–6.5 mg/dl; blood urea–239 mg/dl; serum creatinine–8.7%; and serum procalcitonin–4.5 ng/ml. Dengue serology for IgM done by dengue IgM capture ELISA kit by Panbio was positive and NS1 antigen test performed by Panbio Dengue early ELISA kit was negative. PCR for chikungunya using chikungunya RNA qualitative real time PCR assay was positive. The result of rapid malaria test using SureTest Malaria Pf/Pv HRP2/pLDH kit by Microgene was positive for Plasmodium falciparum and negative for P. vivax. Widal test performed by tube method, using SPAN diagnostics reagents was negative and blood culture performed on BACTEC was sterile.

Chest X-Ray showed increased lung markings with ill-defined shadowing. Ultrasonography revealed mild hepatosplenoomegaly. Magnetic resonance imaging of brain showed non-specific white matter ischaemic changes. The 2D Echocardiography showed normal left ventricular ejection fraction (54%) along with mild mitral regurgitation, tricuspid regurgitation and mild pulmonary artery hypertension. The patient was treated with intravenous artesunate, ceftriaxone, pantocid, pamicol, enset, mucaine gel application for oral ulcers and plenty of intravenous dextrose, ringer lactate and dextrose normal saline (DNS) during hospital stay and was discharged in satisfactory stable condition with proper treatment advice. At the time of discharge patient’s laboratory parameters were: packed cell volume (PCV)–37%; platelet count–189×10⁹/l; total leucocyte count–12.6×10⁹/l; blood urea–31 mg/dl; serum creatinine–0.7 mg/dl and serum sodium–127 mmol/l.

DISCUSSION

Though, previous records of dual infections with dengue and chikungunya, and dengue and malaria exist, reports of concurrent infections with dengue, chikungunya and malaria are rare. Studies on dual infections with dengue and chikungunya were reported by Myers and Carry in 1967, Leroy et al. in 2009, and Chang et al. in 2010. The first case of coinfection with dengue and malaria by F. falciparum was published by Charrel et al. in 2005 and Hati et al. in 2012. Bhalla et al. reported first case of concurrent infection of dengue and malaria in India in
2005. Chahar et al. reported cases of chikungunya and dengue virus co-infections in Delhi, India in 2006. As per the records of the National Vector Borne Disease Control Programme, India; in 2014, Delhi witnessed 847 dengue cases with three deaths, 98 malaria cases, and eight chikungunya cases with no deaths.

Fever, joint pain, headache, vomiting and fatigue are common denominator symptoms of dengue, chikungunya and malaria with different clinical outcomes. Concurrent infections with these infective agents cause overlapping of clinical features leading to diagnostic challenge by the physicians, especially in endemic areas; however, certain parameters are helpful to some extent in differentiating dengue, chikungunya and malaria. Anaemia is a classical symptom of malaria but it is barely described in dengue fever. The triad of haematological findings: atypical lymphocytosis, haemoconcentration and thrombocytopenia might give clue for differentiating dengue infection from that of malaria. Headache, myalgia, mild arthralgia, ocular pain, liquid leak tissue, haemorrhage and thrombocytopenia are common in dengue cases where as severe polyarthritis, arthritis, conjunctivitis, oedema and exanthema are seen more in chikungunya. The laboratory investigations are important to arrive at a definitive diagnosis.

In the present case, the patient was febrile for five days and dengue serology for IgM, NS1 antigen detection, PCR for chikungunya and rapid test for malaria were performed on the day of admission itself along with other routine investigations. The results of dengue IgM positivity and negative NS1 antigen could be because of previously ignored fever by the patient which had given such results on testing. Dengue serology for both IgM and IgG antibodies along with NS1 antigen detection are important as dengue IgM antibodies can be detected in the dengue patients as early as 3 to 5 days after the fever onset and persist for 30–90 days, even detectable for eight months post infection. Similarly, dengue IgG antibodies elevation detection is important to establish secondary infection as they can be detected in serum as early as three days post onset of illness, however peak detection window for accurate diagnosis is 6–15 days following illness onset. Detection of dengue NS1 antigen can be done in serum from Day 1 after onset of fever and up to nine days. It is important to perform dengue serology for both IgM and IgG antibodies as secondary infection by dengue virus may go undetected if IgG antibody detection is not done. Since dengue serology for IgG antibody detection was not requested by the clinician, it was not performed; hence it could not be detected whether patient had primary or secondary dengue infection, which was important. Therefore, consideration for the possibility of concurrent infections, in cases of atypical clinical manifestations or acute febrile illness, is essential especially for early diagnosis as the management protocols for dengue, chikungunya and malaria are different.

Arboviral infections are important public health concerns worldwide. For the countries, where there is local transmission of dengue as well as chikungunya and malaria, it is imperative to effectuate range of technical factors that promote prevention and restrict activity of the causative agents, as they share nearly same clinical manifestations during the first week of infection and poses diagnostic challenge to the treating clinicians. Thus, there is a great need to increase the awareness about the mixed infections among physicians for diagnosis and management and also to report such incidences. Strong clinical judgement on the part of clinician to select battery of tests and understanding diagnostic implication of each disease is essential. Failure or delay to recognize the concurrent infections can delay the initiation of proper therapy resulting in increased morbidity and mortality.

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