Case Report

A Case Report of *Plasmodium Vivax*, *Plasmodium Falciparum* and Dengue Co-Infection in a 6 Months Pregnancy

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Abstract

India being a tropical country, parasitic infections especially with *Plasmodium* species are very common in this region. The present case report is that of *Plasmodium vivax*, *Plasmodium falciparum* and dengue co-infection in a 6 months pregnant lady who was timely diagnosed and appropriately treated followed by a complete recovery along with feto-maternal well-being.

Keywords: Co-infection, Dengue, Malaria

Introduction

Malaria is a major parasitic infection in India, accounting for a sizeable morbidity and mortality. An early diagnosis and complete treatment are the key for containing the disease. Around 1.5 million confirmed cases are reported annually by the national vector borne disease control program of the Government of India. Of these about 50% are due to *P. falciparum*.[1] Malaria is curable if an effective treatment is started early. Delay in treatment may lead to serious consequences including death. Prompt and effective treatment is also important for controlling transmission of the disease. Malaria should be suspected in patients who are residing in or have recently visited endemic areas.

Dengue is the most rapidly spreading mosquito-borne viral disease in the world. In the last 50 years, incidence has increased 30-fold with increasing geographic expansion to new countries and in the present decade, from urban to rural settings. An estimated 50 million dengue infections occur annually and approximately 2.5 billion people live in dengue endemic countries.[2] Reported case fatality rates for the region are approximately 1%, but in India, Indonesia and Myanmar, focal outbreaks away from the urban areas have reported case-fatality rates of 3-5%. Dengue virus (DEN) is a small single-stranded RNA virus comprising four distinct serotypes (DEN-1 to 4).These closely related serotypes of the DEN belong to the genus *Flavivirus* of the family Flaviviridae. Although infection with *P. vivax*, *P. falciparum*, dengue and leptospira has been reported,[3] but so far no case of a mixed infection during pregnancy has been reported.

Access this article online

Quick Response Code:

Website: www.amhsr.org

DOI:
10.4103/2141-9248.121211

Case Report

A 25-year-old 6 months pregnant lady from a rural background was admitted to a private tertiary care hospital in north India with complaints of fever with chills since 4 days. The patient had a BP = 100/60 mm of Hg, pulse = 112 bpm, RR = 22/min, temperature = 101°F, and was maintaining a saturation of 96% with oxygen support at 2 l/min. The patient was dyspneic, had a blanching erythematous rash, pallor (+++) and the fetal heart sounds could be heard. The cardiovascular and neurological examination was, however, normal. A complete blood count with peripheral smear, ELISA for immunoglobulin G (IgG) and immunoglobulin M (IgM) for dengue, were sent along with the routine blood examinations. The patient was managed symptomatically and was given supportive treatment.

The patient had Hb = 4.1 gm/dl, TLC = 5000/mm^3, DLC = $P_{68\%}$, $L_{32\%}$, E_0, B_0, Platelets = 50,000/mm^3, blood urea = 58.8 mg/dl, Sr.creatinine = 1.8 mg/dl, Sr.Na^+ = 145 meq/L, Sr.K^+ = 4.3 meq/L, total bilirubin = 0.8 mg/dl with a direct bilirubin = 0.7 mg/dl and an indirect bilirubin = 0.1 mg/dl, total serum protein = 3.9 g/dl, Sr.albumin = 2.2 g/dl,

Sr.globulin = 1.7 g/dl, Aspartate Amino transferase (AST) = 60 U/L, Alanine Aminotransferase (ALT) =13 U/L, Sr.Alkaline Phosphatase = 113 U/L. Dengue duo Nonprotein Surface (NS1) antigen combo kit manufactured by standardia using one step rapid immunochromatograpic test for detection of NS1 Antigen and IgG and IgM were employed for the detection of dengue infection. Peripheral smear examination revealed presence of gametocytes of *P. vivax* and *P. falciparum*. The histidine rich protein-2 card test was also positive for *P. vivax* and *P. falciparum*. A general blood picture was that of markedly reduced red cell mass, red blood cells were microcytic and hypochromic along with anisopoikilocytosis in the form of tear drop cells, target cells and helmet cells. The treatment was accordingly modified and anti-malarials were started in the form of artisunate based combination therapy. Paracetamol in divided doses was given to control the fever and proper care was taken for fetal well-being by fetal sonography. During fetal sonography the amount of amniotic fluid, blood flow through the Doppler study, fetal activity, placenta and cervix were examined to ensure that there was no fetal compromise. The patient was given four units of packed red blood cell transfusion and was discharged after 7 days of in-patient treatment with a live fetus and is on a regular follow-up.

Discussion

India is a tropical country and is endemic for *P. vivax* and *P. falciparum* malaria. Although malaria mimics the manifestations of many common infectious diseases, all clinically suspected malaria cases should be promptly investigated by microscopy and/or rapid diagnostic test (RDT). The RDT used in the present case was advantage mal card which is an immunoassay based on "sandwitch" principle manufactured by J. Mitra and Co. Pvt. Ltd. The kit had a sensitivity of 100% for *P. vivax* and a malaria negative specificity of 95.83%. A thick and thin film examination of the peripheral smear was done to confirm the co-infection by *P. vivax* and *P. falciparum*. Polymerase Chain Reaction (PCR) is an expensive procedure and could not be done due to the financial status of the patient. In clinical settings equipped with appropriate instrumentation, PCR-based diagnostic strategies enable *Plasmodium* species identification, despite parasitemias at levels below blood smear sensitivity limits. The results obtained by these more sensitive assays are often useful in making specific treatment decisions to kill species (*P. vivax* and *P. ovale*) that are capable of establishing dormant liver stages and subsequent malarial relapses. Despite the advantages of PCR, it is unlikely to be useful outside of well-equipped laboratories where a reliable source of electricity and expensive equipment are available. Early diagnosis and treatment of cases of malaria aims at a complete cure, prevention of progression of uncomplicated malaria to severe disease, prevention of deaths, interruption of transmission, minimizing risk of selection and spread of drug resistant parasites.

Dengue has a wide spectrum of clinical presentations, often with unpredictable clinical evolution and outcome. While most patients recover following a self-limiting non-severe clinical course, a small proportion progress to severe disease, mostly characterized by plasma leakage with or without hemorrhage. An epidemic of dengue swept through the country in 2010 and is still prevalent in various parts of the subcontinent. An early recognition of the symptoms along with appropriate treatment is the key to improve the outcome and thereby reduce the mortality and morbidity of *Plasmodium* and dengue infections especially so if they co-infect the same individual. Concurrent infections of dengue with other bacterial, viral and leptospira infections has been reported earlier.[3-5] In India a co-infection of *P. vivax* and dengue has been reported from Kerela[6] and co-infection of dengue and *P. falciparum* has also been reported in France.[7] Although concurrent infection with *P. vivax, P. falciparum* and dengue has been reported[8] earlier from India, to the best of our knowledge this is the first case of a concurrent infection with *P. vivax, P. falciparum* and DEN during pregnancy in a single patient. All the co-infections are known to have a high mortality and in case of pregnancy the stakes are high. As in this case an aggressive management of the co-existing malaria and dengue infections along with ensuring the safety of the fetus is of utmost importance as more than one life is at stake.

References

1. Guidelines for the Diagnosis and Treatment of Malaria in India 2011. Vol. 2. New Delhi, India: National Institute of Malaria Research; 2011. p. 1.
2. WHO. Dengue and dengue haemorrhagic fever. Factsheet No 117. Geneva: World Health Organization; 2008. p. 5. Available from: http://www.who.int/mediacentre/factsheets/fs117/en/.
3. Kaur H, John M. Mixed infection due to leptospira and dengue. Indian J Gastroenterol 2002;21:206.
4. Sudjana P, Jusuf H. Concurrent dengue hemorrhagic fever and typhoid fever infection in adult: Case report. Southeast Asian J Trop Med Public Health 1998;29:370-2.
5. Myers RM, Carey DE. Concurrent isolation from patient of two arboviruses, Chikungunya and dengue type 2. Science 1967;157:1307-8.
6. Thangaratham PS, Jeevan MK, Rajendran R, Samuel PP, Tyagi BK. Dual infection by dengue virus and *Plasmodium vivax* in Alappuzha District, Kerala, India. Jpn J Infect Dis 2006;59:211-2.
7. Charrel RN, Brouqui P, Foucault C, de Lamballerie X. Concurrent dengue and malaria. Emerg Infect Dis 2005;11:1153-4.
8. Kaushik RM, Varma A, Kaushik R, Gaur KJ. Concurrent dengue and malaria due to *Plasmodium falciparum* and *P. vivax*. Trans R Soc Trop Med Hyg 2007;101:1048-50.

How to cite this article: Pande A, Guharoy D. A case report of *Plasmodium vivax*, *plasmodium falciparum* and dengue co-infection in a 6 months pregnancy. Ann Med Health Sci Res 2013;3:S16-7.

Source of Support: Nil. **Conflict of Interest:** None declared.