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Case Series

Dengue and typhoid co-infection: a case series from a tertiary care hospital in rural South India

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ABSTRACT

Dengue and typhoid are important febrile illnesses endemic to India. A significant increase in incidence of these infections is observed during the monsoon season due to the vector borne and water borne origin respectively. When fever persists/symptoms are overlapping, co-infections with these two diseases should be suspected. Such co-infective conditions present with a clinical dilemma to diagnose and to provide optimum care and treatment. To avoid such dilemma, diagnosis should be made by considering clinical details, lab reports and radiological reports where applicable, keeping seasonality and endemicity in mind. In this case series, we present 4 cases of dengue and typhoid co-infection with an intent to create awareness regarding the early diagnosis and prompt treatment to improve patient condition and prevent mortality and morbidity. Diagnosis of dengue is made by taking relevant clinical details and NS1 antigen/IgM antibody positive status into consideration. Diagnosis of typhoid is made by considering relevant clinical details, widal test positive status with titer >1:80 for TO and TH.

Keywords: Dengue, Typhoid, Widal test, Co-infection, Acute febrile illness

INTRODUCTION

Dengue and typhoid present as acute febrile illness.[1] Mosquito breeding increases during rainy season. Drinking water contamination due to floods can also happen in rainy season due to heavy rains. Hence in rainy season incidence of these two infections increases.[2] Dengue and typhoid are endemic in India and present with similar findings.[3] Since they are endemic in our country, co-infections can occur. When co-infections occur, they present with overlapping symptoms, leading to diagnostic challenges.[4] Here we present a case series of four cases of dengue-typhoid co-infection.

CASE SERIES

Case 1

A 14-year-old boy was presented with fever, joint pains from six days. It was associated with pain abdomen and 2 episodes of vomiting. Basic blood tests revealed leucopenia, thrombocytopenia and elevated PCV. Dengue rapid test and ELISA were positive for NS1 antigen. He was admitted and treatment was started. Fever did not subside even after four days of treatment. USG abdomen done showed mild hepatosplenomegaly. Other tests like malaria antigen, Weil-Felix tests were negative. Widal test was done and it was positive and TO and TH titers were >1:160 and >1:80 respectively. He was treated with antimicrobial azithromycin (20 mg/kg/day). Fever started subsiding after 4 days.

Case 2

A 46-year-old female patient presented with h/o fever and headache from past six days, associated with mild pain abdomen. She also complains of fatigue, loss of appetite and two episodes of vomiting. Basic blood tests revealed mild thrombocytopenia. Dengue rapid test and ELISA were positive for NS1 antigen. Widal test was done

simultaneously which was positive and TO and TH titer was >1:160 and >1:80. She was treated with oral ciprofloxacin, 500 mg twice daily. Fever started to subside after two days of initiation of antibiotics.

Case 3

A 3-year-old male child presented with h/o fever from five days associated with retro orbital-pain. He also complains of h/o pain abdomen and four episodes diarrhea. Basic blood tests revealed thrombocytopenia and elevated PCV. Dengue rapid test and ELISA were positive for NS1 antigen. Abdominal USG revealed presence of hepatosplenomegaly. Typhidot test done simultaneously showed IgM positive. Patient was put on Azithromycin 20 mg/kg/day for seven days for which he responded well. Patient was discharged after recovery.

Case 4

A 22-year-old male patient presented with fever and pain abdomen from past five days. There were seven episodes of diarrhea. He also c/o generalized body pain and fatigue. Basic blood tests showed elevated PCV and hemoglobin levels. Dengue rapid test and ELISA were positive for IgM antibodies. Patient was started on treatment. Fever persisted despite treatment. Rapid malaria antigen, leptospirosis tests were negative. Widal test was done and it was positive and TO and TH titer was >1:80 and >1:80. Patient was started with Oral azithromycin 500 mg twice a day for seven days. Patient was symptomless after three days of antimicrobial therapy and was discharged.

DISCUSSION

Dengue virus and *Salmonella typhi*, *Salmonella paratyphi* A and B are the priority pathogens causing acute febrile illness and they fall under priority pathogens list 1A. This list consists of commonly detected pathogens in clinical settings that are crucial to diagnose before initiating treatment for in Indian clinical settings.[5] Viral infections lead to immunosuppression and hence many times they are followed by bacterial infections. Hemodynamic and inflammatory changes that occur in dengue predispose to invasive infection by *Salmonella*.[6] Prevalence of dengue and typhoid co-infection is quite noticeable with 6.9% in a study conducted by Vimal et al, 7.8% in a study conducted by Sharma et al and 18.95% in a study conducted by Mahato et al.[4,6,7] Co-infections often lead to superimposed symptoms, leading to diagnostic dilemma.[7] Summary of diagnosis of dengue and typhoid in our case series is given in Tables 1 and 2 respectively.

Fever and other typical features of dengue are present in all the four cases. Thrombocytopenia was seen in three cases. Dengue NS1 antigen/IgM antibody test was positive in all the four cases indicating acute dengue infection.

A final diagnosis of dengue was done by taking clinical details and lab reports into consideration.

Table 1: Diagnosis of dengue.

Cases	Clinical details		Lab reports		Final diagnosis
	H/o fever	H/o body ache/joint pain/ headache/ retro-orbital pain	Thrombocy-topenia	Dengue NS1/IgM antibody test by rapid card test and ELISA: positive	Clinical and laboratory diagnosed case of dengue
Case 1	Yes	Yes	Yes	Yes	Yes
Case 2	Yes	Yes	Yes	Yes	Yes
Case 3	Yes	Yes	Yes	Yes	Yes
Case 4	Yes	Yes	No	Yes	Yes

Table 2: Diagnosis of typhoid.

Cases	Clinical details		Lab reports		Final diagnosis	Response to anti-*Salmonella* antimicrobial therapy with Azithromycin/ Ciprofloxacin
	H/o fever	GI symptoms: pain abdomen/ vomiting/ diarrhea	Widal test positive with significant titer/ Typhidot IgM positive	USG abdomen showing heap-tosplenomegaly	Clinical and laboratory diagnosed case of typhoid	
Case 1	Yes	Yes	Yes	Yes	Yes	Yes
Case 2	Yes	Yes	Yes	No	Yes	Yes
Case 3	Yes	Yes	Yes	Yes	Yes	Yes
Case 4	Yes	Yes	Yes	No	Yes	Yes

Fever and GI symptoms were seen in all four cases. Typhoid presents with fever and varied GI symptoms like pain abdomen, nausea, vomiting, diarrhea/constipation and hepatosplenomegaly.[8] Hepatosplenomegaly is seen in two cases on USG abdomen. Widal test/typhidot was used for the lab diagnosis of typhoid; a titer >1:80 for TO and TH is considered significant for widal test in our study.

Three of the four cases were widal positive and one case was positive by typhidot test.

A final diagnosis of typhoid was done by taking clinical and laboratory details into consideration, which was supported by response to anti-salmonella antimicrobial therapy.

Blood culture was not done due to low yield, high cost on patients and longer turnaround time.

Roy et al concluded that widal test is relevant as a diagnostic tool for enteric fever and it is more convenient, cheap and gives result faster.[9] Sarma et al concluded that Widal test and typhidot tests are important diagnostic tools for diagnosis of enteric fever and both have good specificity.[10]

Typhoid is endemic in India and hence baseline titers and significant titers are important. There are no national guidelines available that specify widal titers for our country.

Studies are conducted by different authors to estimate widal titers. In Tables 3 and 4 studies done by different authors for estimation of baseline widal titers and significant widal titers are mentioned.

Table 3: Baseline Widal titers.

Study	Region	Baseline titers
Anithra et al[11]	Tamil Nadu	≥1:20 for TO and TH
Shethwala et al[12]	Gujarat	1:40 for TO and TH

Table 4: Significant Widal titers.

Study	Region	Significant titers
Walke et al[13]	Maharashtra	≥1:80 for TO and TH
Bijapur et al[14]	Kerala	≥1:80 for TO and TH

Hence in our study, widal titer >1:80 for TO and TH is considered significant.

CONCLUSION

Patients in our case series presented with fever, headache/eye pain/body ache and GI symptoms such as pain abdomen/vomiting/diarrhea. It is evident that patients presented with overlapping symptoms of dengue and typhoid. GI symptoms are seen both in typhoid fever and dengue with warning signs. If not diagnosed and treated earlier, dengue and typhoid can lead to life threatening complications, which are shock and intestinal perforation respectively. In endemic areas, especially in rainy seasons, co-infection with dengue and typhoid should be considered if the symptoms are overlapping/ fever is persisting/response to initial therapy is poor. Final diagnosis should be made by taking clinical details, lab reports and radiological reports (where applicable), keeping seasonality and endemicity in mind. Physicians should keep in mind about possibilities of co-infections and plan patient management accordingly.

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