

# Tropical Co Infections – A Diagnostic Dilemma: Case Series from Northern India

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## Abstract

The high incidence of infection with of two or more tropical illness like scrub typhus, dengue fever, malaria, leptospirosis and enteric fever during monsoon and post-monsoon season is common in northern part of India. The overlap in clinical symptomatology may pose a diagnostic dilemma leading to delayed management and fatal complications. Tropical co-infection has been previously reported in adult patients mostly with scrub and dengue. We hereby present 4 cases of co infections in children (< 10 years) who were admitted with undifferentiated fever and later diagnosed to have coinfection.

**Keywords:** Co-Infections; Tropical Fever; Hepatosplenomegaly

## Introduction

Acute undifferentiated fever is defined as fever of less than two weeks duration with absence of organ-specific clinical features [1] and are common during monsoon and post monsoon period in tropical countries like India [2]. Common differentials include dengue fever, chikungunya, scrub typhus, malaria, enteric fever, leptospirosis and seasonal influenza [3]. The clinical manifestations are high grade fever, generalized body ache, arthralgia, myalgia, nausea, vomiting and maculopapular rash, bleeding manifestations and/or encephalopathy. The overlap in symptomatology may sometimes complicate the diagnosis, hence delaying treatment and leading to fatal outcomes. Dual infections with various tropical fevers have been reported from the northern state of Uttarakhand, India during epidemics of acute febrile illnesses [3]. Also there have been few case reports of coinfections in adults from other various parts of India however to our best knowledge coinfection in children have not been yet reported. We hereby report 4 cases of coinfection in children with dengue, scrub, enteric and malaria. Early suspicion and diagnosis of coinfection plays an important role in prognosis and outcome, as reported earlier coinfections can be more severe [4].

## Case details

All four patients (<10 years) were admitted in the pediatric emergency during monsoon season with acute undifferentiated fever. Routine investigations like complete blood count, liver function test (LFT), renal function test (RFT), prothrombin time (PT)/ International Normalized Ratio (INR), chest x-ray (CXR), blood culture and special investigations targeting tropical fever as dengue IgM antibody ELISA (Enzyme-linked Immunosorbent Assay) and NS1 antigen, Malaria antigen, scrub IgM antibody ELISA and widal test were performed for all patients. Cerebrospinal fluid analysis (CSF) analysis and neuroimaging were done where indicated. The presenting complaints, duration of illness, clinical findings, positive investigations, response time to treatment and outcome was noted in all cases. (Table 1). The mean age of presentation was 5 years, while the average time of presenting illness was 6 days. Fever was present in all patients, altered sensorium in 2 cases, bleeding manifestation in form of petechial rash in 1 case while other 2 cases presented with gastrointestinal bleeding. All the 4 cases had organomegaly, meningeal signs were present in 2 cases. Three patients had severe thrombocytopenia on presentation and one had mild thrombocytopenia, all patients showed raised transaminases. Co infection with dengue and scrub was found in 3 cases while scrub and enteric in one case. Non response to initial management with one laboratory diagnosis was the main factor for further evaluation, revealing coinfection with tropical fevers. The patients with coinfection with dengue and scrub typhus were managed with fluid therapy, doxycycline and monitoring of platelet count and hematocrit, while in patients with scrub typhus and enteric fever, doxycycline and ceftriaxone were given simultaneously. All our cases responded well to treatment and were discharged after treatment completion.

	Case 1	Case 2	Case 3	Case 4
Age /sex	6 years/male	5 years/male	4 years/female	6 years/female
Duration of illness	7 days	5 days	6 days	6 days
<b>Presenting Complaints</b>				
Fever	+	+	+	+
Vomiting	-	+	-	-
Loose stools		-	+	-
Pain abdomen	+	-	+	+
Bleeding	-	-	-	+
Altered sensorium	+	+	-	-
Seizures	-	-	-	-
Breathing difficulty	-	-	-	-
<b>Signs</b>				
Odema	-	-	-	-
Meningeal signs	+	+	-	-
Hepatomegaly/ splenomegaly	Liver 3 cms	+/-	+/+	+/+
<b>Investigations</b>				
Hemoglobin	9.3g/dl	9.0	8.1	7.3
Total Leukocyte count	6700	21000	3800	3200
Plateletcount	33000/mm <sup>3</sup>	1.1 lac	38000	27000
Bloodurea/ Serumcreatinine	12/0.6	23/0.6	30/0.2	44/0.4
Liver function test				
SGOT/SGPT/TSB	140/67/1.4	292/199/2.3	196/84/1.2	116/57/4.3
PTI/INR/PT	90/1.4	88/1.5	94/1.05/14	93/1.07/15
DengueIgM	+	+	-	+
Malaria antigen	-	-	-	-
Widal test	-	-	+	-
Scrub IgM	+	+	+	+
Blood culture	Sterile	sterile	Sterile	Sterile
<b>Outcome</b>	Recovered	Recovered	Recovered	recovered

**Table 1:** Clinical and biochemical profile of patients

## Discussion

Infections as dengue fever, scrub typhus, malaria, enteric fever, leptospirosis and influenza are seen more commonly during the rainy season in northern India. The overall prevalence of co infections among patients of acute undifferentiated fever previously reported from various adult studies are 1.3% [4] and 1.88% [5]. Scrub typhus and dengue coinfection was found to be most common coinfection with 10 patients out of 16 in one study [4] while 15 cases out of total 34 cases in another study [5]. Other coinfections have been reported with scrub and malaria, dengue and malaria, scrub and leptospirosis and dengue and leptospirosis. In our case series also 3 out of 4 cases were found to be positive for scrub and dengue while one with scrub and enteric.

The clinical features are nonspecific including fever, headache, and gastrointestinal symptoms as main presenting complaints. All our cases had fever with average duration of 6 days, jaundice and raised transaminases, bleeding manifestations were present in one case, severe thrombocytopenia in 3 cases. Some case reports have described severe symptoms in form of bleeding and renal failure in coinfection group as compared to mono-infections<sup>7</sup> while other studies have shown milder clinical manifestations and less severe organ dysfunction in co infection group as compared to mono-infections [5]. However, in our cases also, very severe or life threatening manifestations were not found. There have been case reports on scrub and typhoid coinfection in travelers from endemic areas presenting with high grade fever, gastrointestinal symptoms and blood culture showing growth of salmonella typhi and later in view of high-grade fever, thrombocytopenia diagnosed to be positive for scrub typhus [8].

All patients were managed primarily with fluid and electrolyte balance and vitals monitoring. Doxycycline was given for 10 days in scrub typhus and dengue co infection cases, while doxycycline and ceftriaxone for 10 days in scrub and enteric infection patient.

## Conclusion

The marked similarity in the symptomatology of tropical fevers may complicate the diagnosis, also, laboratory results in such setting may be challenging. Hence, early suspicion of mixed tropical infections in case of unusual presentation or non response to treatment may be helpful in preventing morbidity and mortality.

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