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Case Report

Diagnostic dilemma between Mycoplasma pneumoniae, leptospirosis and severe dengue in a child presenting with shock: a case report

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ABSTRACT

Acute febrile illness with shock in children is a common pediatric emergency in tropical countries and often poses a diagnostic challenge. Severe dengue and leptospirosis are important differentials because of their overlapping manifestations, including thrombocytopenia, hepatic dysfunction, shock and multiorgan involvement. Rarely, atypical bacterial infections such as mycoplasma pneumoniae may present with severe extrapulmonary manifestations closely mimicking tropical infections. An 8-year-old boy presented with fever for 7 days, vomiting, facial and pedal edema, abdominal pain, red-coloured urine and altered sensorium. On examination, he had hypovolemic shock, respiratory distress, tender hepatomegaly, splenomegaly and encephalopathy. Laboratory investigations revealed anemia, thrombocytopenia, hyponatremia, transaminitis, conjugated hyperbilirubinemia, hypoalbuminemia, hematuria and proteinuria. Initial dengue IgM was weakly reactive, raising suspicion of severe dengue. Leptospirosis was also considered because of disproportionate hyperbilirubinemia and splenomegaly. The child deteriorated with respiratory failure requiring mechanical ventilation and inotropic support. The tropical fever panel, including dengue PCR, leptospira PCR, malaria and typhoid testing, was negative. Subsequently, Mycoplasma pneumoniae IgM returned positive. Following the treatment with azithromycin along with intensive supportive care, the child improved clinically and was discharged after 10 days. Mycoplasma pneumoniae is classically described as a cause of “walking pneumonia" but rarely can present with severe extrapulmonary manifestations, including shock and multiorgan dysfunction. This case highlights the diagnostic overlap between severe dengue, leptospirosis and mycoplasma pneumoniae infection in tropical settings. Clinicians should maintain a broad differential diagnosis in children presenting with shock and thrombocytopenia, particularly when initial investigations for common tropical infections are inconclusive.

Keywords: Mycoplasma pneumoniae, Severe dengue, Leptospirosis, Paediatric shock, Tropical fever, Hepatitis, Thrombocytopenia, Extrapulmonary manifestations

INTRODUCTION

Acute febrile illness with shock is a frequent paediatric emergency in tropical regions.[1-4] In India, severe dengue and leptospirosis remain among the most important etiological considerations in children presenting with thrombocytopenia, hepatic dysfunction, capillary leak and multiorgan involvement.[5-6] However atypical infections such as Mycoplasma pneumoniae can occasionally produce severe extrapulmonary manifestations that closely mimic these tropical illnesses, leading to significant diagnostic uncertainty.[7-8] Mycoplasma pneumoniae is commonly associated with mild respiratory tract infection or atypical pneumonia. Extrapulmonary manifestations involving the liver, haematological system, central nervous system, kidneys and cardiovascular system are uncommon but increasingly recognized. Severe presentations with shock

and multiorgan dysfunction are rare in children.[9-11] We report a case of an 8-year-old male child presenting with shock, thrombocytopenia, hepatic dysfunction, respiratory failure and altered sensorium, initially suspected to have severe dengue or leptospirosis, but only Mycoplasma IgM was a positive finding in the investigation.

CASE REPORT

An 8-year-old previously healthy boy presented with a fever for 7 days, which was moderate to high-grade and intermittent in nature. He developed vomiting for 3 days, followed by swelling over the feet that progressively involved the face and abdomen. There were 2-3 episodes of red-coloured urine associated with abdominal pain and excessive sleepiness.

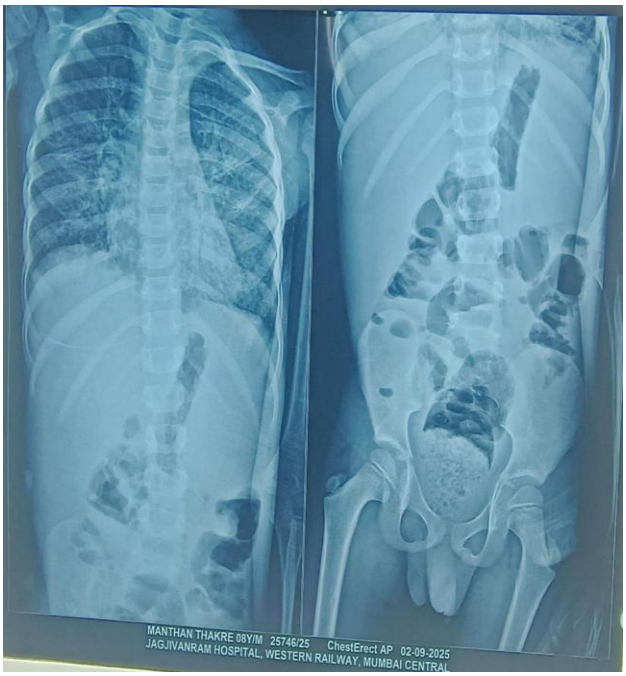

Figure 1: X-ray chest with abdomen 02/09/25: nonhomogeneous patchy opacities in the left mid and lower zones.

There was no history of rash, cough, sore throat, skin infection, recent travel, or exposure to contaminated water. On admission, the child was lethargic and drowsy. Vital signs revealed tachycardia with a heart rate more than 120 per minute; respiratory rate of 50 per minute with respiratory distress; blood pressure of 82/53 mm Hg (<5th percentile for age); and oxygen saturation of 90% in room air. Peripheral extremities were cold and clammy, suggestive of shock. Respiratory examination revealed subcostal retractions and intercostal indrawing. Abdominal examination showed tender hepatic enlargement of 2 cm below the right costal margin, a palpable spleen of 2.5 cm below the left costal margin, guarding and abdominal tenderness. Neurological assessment revealed a Glasgow Coma Scale score of 10/15.

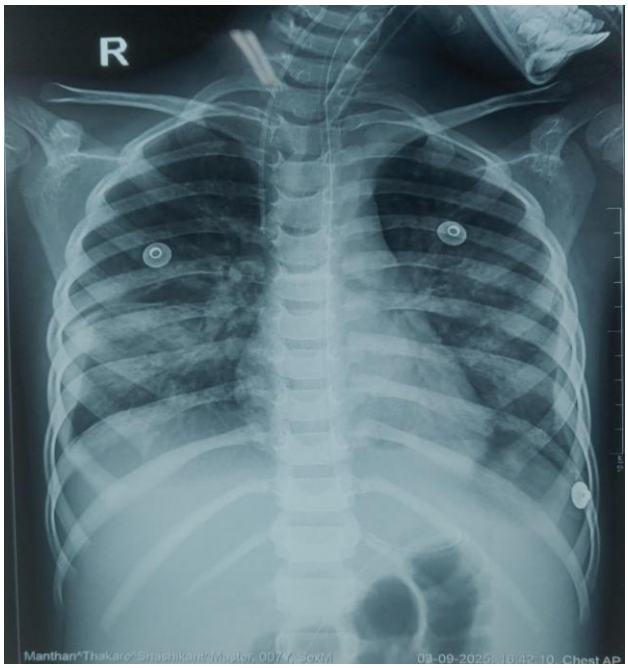

Figure 2: Chest X-ray 03/09/2025: bilateral minimal to mild pleural effusion and bilateral mid and lower zones with diffuse inhomogeneous opacities.

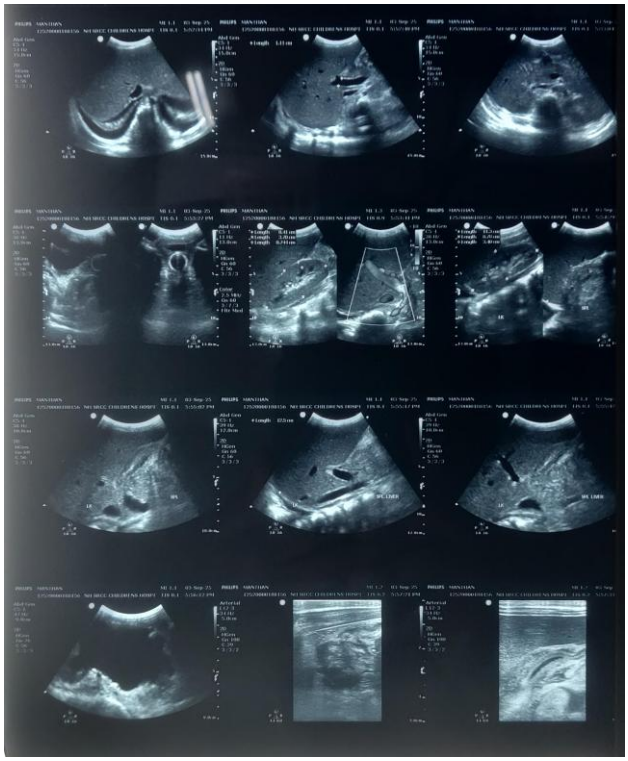

Figure 3: USG abdomen on 03/09/2025: splenomegaly, dilated portal vein and IVC, bilateral moderate pleural effusion, mild edematous wall thickening of bowel loops (no obstruction) and hyperechogenicity of bilateral renal cortex- possible acute kidney injury.

Initial laboratory investigations demonstrated anaemia, thrombocytopenia, hyponatremia, elevated inflammatory markers, transaminitis, conjugated hyperbilirubinemia, hypoalbuminemia, haematuria and proteinuria.

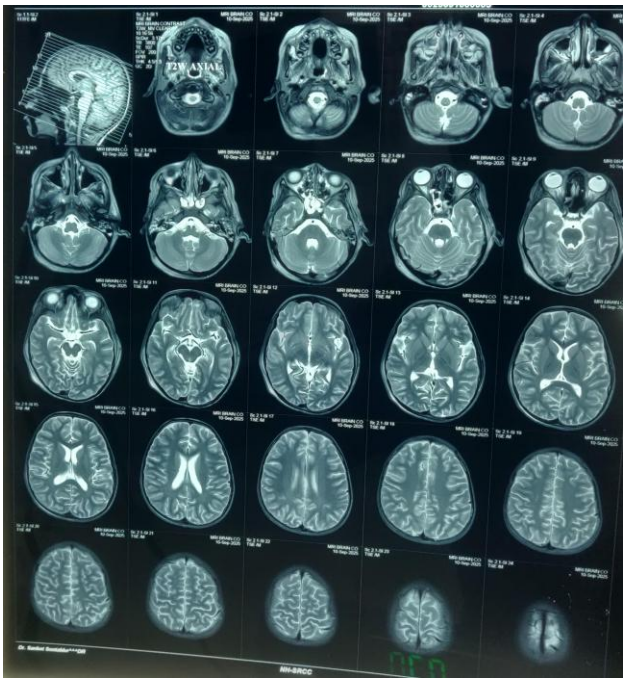

Figure 4: CT scan of the brain on 10/09/25: mild, generalized cerebral volume loss with sinusitis without any other intracranial abnormality.

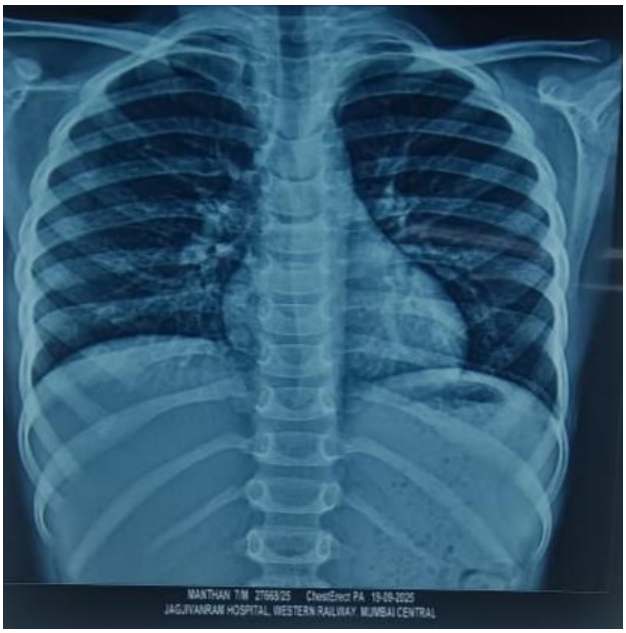

Figure 5: Normal X-ray of the chest on recovery on 07/10/25.

Clinical course and management

The child was initially managed as a case of severe dengue with hypovolemic shock. Oxygen was administered via non-rebreather mask, and three normal saline boluses (20 ml/kg each) were given. Empirical intravenous ceftriaxone and amikacin were initiated.

Despite initial management, the child continued to have persistent shock with worsening respiratory distress. Packed red blood cell transfusion at 15 ml/kg was administered approximately 17 hours after admission in view of falling haemoglobin levels and melena. Subsequently, the child developed respiratory failure with decompensated shock requiring intubation and invasive mechanical ventilation. A central venous catheter and arterial line were placed, repeat fluid resuscitation was performed, and inotropic support was initiated.

Investigations revealed elevated inflammatory markers, worsening transaminases and hyperbilirubinemia. Blood cultures and tropical fever panels, including dengue PCR, leptospira PCR, malaria and typhoid fever testing, were negative.

Albumin infusion was administered in view of significant hypoalbuminemia and ongoing hypovolemia. Inotropes were gradually tapered by day 4. Repeat albumin infusion and furosemide infusion were initiated for fluid management. Sedation was tapered and subsequently stopped.

On day 5, pressure support ventilation/continuous positive airway pressure trial was successfully tolerated, and the child was extubated to non-invasive ventilation. On the same day, Mycoplasma pneumoniae IgM returned positive. Intravenous meropenem and oral azithromycin were initiated. The child required invasive mechanical ventilation for 4 days. Repeat arterial blood gas analysis showed improvement in oxygenation. He was subsequently transitioned to high-flow oxygen therapy. Although hemodynamically stable, the child remained poorly responsive with episodes of blank staring. Magnetic resonance imaging of the brain performed on day 8 was normal. Neurological responsiveness gradually improved by day nine. The child resumed oral feeds, remained vitally stable and was discharged on day 10 of hospitalization.

Other investigations

Bronchoalveolar lavage (BAL) sample examined on 04/09/2025 by endotracheal secretion gram stain revealed 10-15 pus cells/HPF, 80-90 RBCs/HPF and 1-2 macrophages/HPF, with no fungal elements or organisms seen. The BioFire pneumonia panel performed on 04/09/2025 did not detect any bacterial, atypical bacterial or viral pathogens. The BioFire GI Panel on 05/09/2025 also showed no organism detected. Urine culture and sensitivity testing on 06/09/2025 showed no growth after 60 hours of incubation. Similarly, BAL fluid culture on 06/09/2025 demonstrated no growth after 60 hours, and blood culture collected on 08/09/2025 showed no growth after 5 days of incubation.

Table 1: Serial haematology report.

Parameters	02/09/25 4:44pm	03/09/25 6:45 am	03/09/25 12:46 pm	03/09/25 5 pm	04/09/25	05/09/25	06/09/25	12/09/25	19/9/25	7/10/25	Units
Hemoglobin (HB)	9.2	7.6	7.7	9.6	9.2	8.8	9.0	10.4	10.8	11.2	g/dl
Total RBC count	4.61	3.86	3.97	3.8	3.6	3.5	3.7	4.1	5.06		Million/mm³
Hematocrit (PCV)	29.3	24.9	25.2	30	28	27	29	33	36.1		%
MCV	63.56	64.51	63.48	78	77	76	78	80	71.34		Fl
MCH	19.96	19.69	19.40	25	25	24	25	26	21.34		Pg
MCHC	31.40	30.52	30.56	32	31	31	32	33			G/dl
Total WBC count	12200	9400	12100	14,500	16,200	15,800	13,400	9,800		13900	Cells/mm³
Neutrophils	46	48	48	78	82	80	75	62		29	%
Lymphocytes	39	46	37	18	14	16	20	30		58	%
Eosinophils	1	0	0							7	%
Platelet count	85000	75000	86000	1.4	1.2	1.1	1.5	2.6	516000	368000	Lakh/mm³
RDW	14.1	14.4	14.7						21.9	19.6	%
N/L ratio	1.18	1.07	1.30						0.48		
ESR				35	40	38	30	18			Mm/h
Peripheral smear		Microcytic hypochromic, Mild anisopoikilocytosis, Eliptocytes ++, Few large platelets, Activated lymphocyets seen, Metamyelocytes 1%	Microcytic hypochromic, Mild anisocytosis, Reactive lymphocyets seen	Microcytic hypochromic	Same	Same	Improving	Normocytic			-
Blood group	B positive										
AEC										973	/mm³

Table 2: Biochemistry.

Investigations	02/09/25 4:44 pm	03/09/25 12:46 pm	03/09/25 5 pm	04/09/25	05/09/25	06/09/25	08/09/25	12/09/25	19/09/25	07/10/25	Units
Serum creatinine	0.6	0.5	0.64	-	0.66		0.28	0.29		0.5	mg/dl
Blood urea nitrogen (BUN)	22.54	17.47	17.0	-	20.4		16.6	9.0		7.52	mg/dl
Sodium (NA+)	126	135	140	-	144		138	136		137	Mmol/l
Potassium (K+)	5.72	5.24	4.9	-	3.9		3.3	5.3		4.14	Mmol/l
Chloride (CL-)			112	-	114		99	-			Mmol/l
Bicarbonate (HCO_3-)			21.2	-	24.7		-	-			Mmol/l
Bilirubin total	4.18		5.10	5.36	6.14		2.83	1.60	1.2	0.93	mg/dl
Bilirubin direct	3.88		4.88	4.85	5.23		1.59	1.09	0.7	0.48	mg/dl
Bilirubin indirect	0.30		0.22	0.51	0.91		1.24	0.51	0.5	0.45	mg/dl
Serum albumin			2.0	2.2	2.3		2.6	3.9			g/dl
SGOT (AST)	867		1117	873	696		322	73	42	31	U/l
SGPT (ALT)	348		478	398	356		256	144	47	20	U/l
ALP	913.67		-	851	-		-	-	369.82	270.08	U/l
GGT			-	287	-		-	-			U/l
Calcium	7.7		7.3	-	7.5		7.8	9.6			mg/dl
Magnesium	1.96		1.96	-	1.85		1.56	1.92			mg/dl
Phosphorus	3.0		6.5	-	3.6		3.8	4.9			mg/dl
Prothrombin time (PT)	11.6		15.7	-	-		-	-			Sec
INR	1.03		1.422	-	-		-	-			-
CRP	2.42			5.2						0.06	mg/dl
Procalcitonin					3.24						ng/ml
Total protein	5										mg/dl
Serum albumin	2.2										mg/dl
Serum globulin	2.80										mg/dl
AG ratio	0.79										
Vitamin D									24.8		ng/ml
Vitamin B12									220		pg/ml
Serum ferritin				3302.57			757				ng/ml
Ammonia						50					Mic mol/lit

Table 3: ABG reports (serial monitoring).

Parameters	03/09/25 6.36 am	03/09/25 12:30 pm	04/09/25	06/09/25	Units	Reference range
PH	7.328	7.257	7.28	7.36	-	7.35-7.45
$PACO_2$	36.1	48.1	52	44	Mm Hg	35-45
PAO_2	66	41.7	68	85	Mm Hg	80-100
HCO_3^-	18.4	20.7	23	24	Meq/l	22-26
Base excess	-6.4	-5.2	-3	-1	Meq/l	-2 to +2
SAO_2	91.6	67.7	90	96	%	95-100
Lactate	1.3	1.6	3.2	1.8	Mmol/l	0.5-2.2
FIO_2			40	35	%	-

Table 4: Tropical fever profile report.

	02/09/25 4:44 pm	04/09/25	05/09/25	19/09/25	20/09/25	22/09/25	07/10/25		
Parameters		**Results**						**Units**	**Reference range**
Dengue NS1 antigen	Non reactive	Negative		Non-reactive			Non reactive	-	Negative
Dengue IgM	Weakly reactive	Negative			Non-reactive		Non reactive	-	Negative
Dengue IgG		Negative			Non-reactive			-	Negative
Malaria parasite (peripheral smear)	Negative	Not detected						-	Not detected
Rapid malaria antigen (HRP2/PLDH)		Negative						-	Negative
Salmonella typhi IgM	Negative			Negative					
Widal test (S. Typhi O)		1:80						Titre	<1:80
Widal test (S. Typhi H)		1:80						Titre	<1:80
Chikungunya IgM		Negative						-	Negative
Leptospira IgM		Negative					Non reactive	-	Negative
Leptospirosis IgG							Non reactive		
Scrub typhus IgM		Negative						-	Negative
Mycoplasma pneumoniae IgM			>27			11.00		Au/ml	

Table 5: Urine routine and microscopy report.

	03/09/25	04/09/25		
Parameters		**Results**	**Units**	**Reference range**
Colour	Dark yellow	Pale yellow	-	Pale yellow
Appearance	Turbid	Clear	-	Clear
Specific gravity	1.020	1.020	-	1.005-1.030
PH		6.0	-	4.5-8.0
Protein (albumin)	Positive (+)	Trace	-	Negative
Glucose	Negative	Negative	-	Negative
Ketones	Negative	Negative	-	Negative
Bile salts		Negative	-	Negative
Bile pigments	Positive (++)	Negative	-	Negative
Urobilinogen	Normal	Normal	-	Normal
Blood (hemoglobin)		Negative	-	Negative
Nitrites	Negative	Negative	-	Negative
Leukocyte esterase		Negative	-	Negative
Pus cells	3-5/hpf	2-4 /hpf	/hpf	0-5/hpf
RBCs	8-10/hpf	0-1/hpf	/hpf	0-2/hpf
Epithelial cells	3-4/hpf	Few	-	Few
Casts	Absent	Nil	-	Nil
Crystals	Absent	Nil	-	Nil
Bacteria	Not seen/hpf	Nil	-	Nil
Yeast cells		Nil	-	Nil

DISCUSSION

This child initially fulfilled criteria suggestive of probable severe dengue, including fever, thrombocytopenia, shock, hepatic dysfunction and respiratory compromise. However, several findings argued against dengue, including absence of haemoconcentration, negative NS1 antigen and negative dengue PCR. Leptospirosis was another strong differential diagnosis because of disproportionate conjugated hyperbilirubinemia, splenomegaly, renal involvement, and shock. Nevertheless, the absence of exposure history and negative leptospira PCR reduced the likelihood of this diagnosis. Mycoplasma pneumoniae is traditionally described as a cause of atypical pneumonia or "walking pneumonia." However, extrapulmonary manifestations are increasingly recognized and may occur due to immune-mediated injury, direct cytotoxicity or vascular inflammation. Reported manifestations include hepatitis, haemolytic anaemia, thrombocytopenia, encephalopathy, myocarditis, acute respiratory distress syndrome and shock.[11] In the present case, positive Mycoplasma pneumoniae IgM together with pulmonary involvement and subsequent clinical improvement after azithromycin supported the diagnosis.

The striking extrapulmonary manifestations, including hepatic dysfunction, thrombocytopenia, encephalopathy and shock, created a diagnostic overlap with severe dengue and leptospirosis. Hemophagocytic lymphohistiocytosis (HLH) was also considered as a possible complication because all three differential diagnoses have been associated with secondary HLH.

However, rapid clinical improvement following antimicrobial therapy and supportive care made HLH less likely. This case underscores the importance of maintaining a broad differential diagnosis in children presenting with shock and multiorgan dysfunction in tropical settings, especially when investigations for common endemic infections are inconclusive.

CONCLUSION

Mycoplasma pneumoniae infection can rarely present with severe extrapulmonary manifestations, including shock, hepatic dysfunction, thrombocytopenia, respiratory failure and encephalopathy, closely resembling severe dengue or leptospirosis. In tropical countries where dengue and leptospirosis are endemic, clinicians should consider atypical pathogens when clinical findings are atypical or laboratory investigations are inconclusive. Early recognition, intensive supportive care and timely initiation of targeted antimicrobial therapy can significantly improve the outcome.

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