

Co-infection with SARS CoV-2 and dengue virus with thrombocytopenia: A first case report from Nepal

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ABSTRACT

Co-infection of COVID-19 with dengue infection is quite challenging to differentiate due to its overlapping clinical and laboratory manifestations. We report a 22-year-old female with presented to Civil Service Hospital, emergency department with complaints of persistent fever with multiple episodes of vomiting, headache and myalgia. On examination, she was ill-looking, dehydrated with a low blood. Reverse transcriptase – polymerase chain reaction of nasopharyngeal swab detected SARS CoV-2, and dengue antibodies IgM detected. She was conservatively managed in COVID-high care unit with regular laboratory monitoring of platelet level and discharged after ninth day of admission.

Keywords: Case report, COVID-19, dengue, thrombocytopenia.

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Submitted: March 18, 2022

Accepted: June 26, 2022

To cite: Maharjan S, Maharjan E, Bista B. Co-infection with SARS CoV-2 and dengue virus with thrombocytopenia: A first case report from Nepal. JGMC Nepal. 2022;15(1):88-91. DOI: 10.3126/jgmcn.v15i1.43017

INTRODUCTION

Ever since the first case of reported dengue fever in 2004 in Nepal, cases of outbreak of dengue is increasingly reported.¹ SARS CoV-2 which was started from Wuhan, China was declared as a global pandemic on March 11, 2020.² In Nepal, the first case of COVID-19 was reported in January 23, 2020. This highly contagious air borne viral disease has so far already claimed more than 12,000 lives in Nepal.³

Coexistence of dengue and SARS CoV-2 infection has proven to be a serious health concern, especially in dengue epidemic topical countries. Clinical similarities between two disease along with laboratory similarities like leucopenia and thrombocytopenia have often seen to have created confusion between the diseases. Even though the management of these two viral infectious diseases are completely different, management of co-infective cases remain a serious health challenge to the treating physician.

Treatment is based on the severity of illness, oxygen saturation, respiratory rate, fever and classifying it as mild, moderate and severe COVID-19. Mild and asymptomatic patients are kept on home isolation and medicines are given to relieve symptoms. Moderate to severe COVID-19 are treated by admitting in hospital.³ According to national protocol, dengue infection is classified based upon the clinical manifestation and presence or absence of warning signs such as abdominal tenderness, mucosal bleeding, liver enlargement into Group A, Group B, Group C. Group A is a patient with clinical manifestation without warning signs and can be managed conservatively at home. Group B and Group C have clinical manifestation with warning signs and must admitted in hospital for management.¹ Although there is no specific management of both the infections, treatment plan somehow goes hand in hand along with

supportive management including intravenous fluids and oxygen. However, COVID-19 being hypercoagulable state and dengue patients being prone to bleeding use of anticoagulants still has its own risk on these patients.

We here by present a first case of co-infection with dengue and SARS CoV2 infection from Nepal.

CASE REPORT

A 22-year-old female, resident of Kathmandu presented to emergency department with fever, cough and easy fatiguability of seven days on November 3, 2021. She had mild grade fever during initial four days then high grade reaching maximum temperature 103°C without chills and rigor. On third day of admission, she developed headache especially in the retroorbital region, along with generalized bodyache and multiple episodes of vomiting after meal that contained food particles not mixed with blood and bile especially after eating. On examination, she was ill-looking, with low blood pressure of 60/40 mm Hg in both arms. Her general and systemic examination were unremarkable during her presentation in the emergency.

She was immediately resuscitated with one liter of bolus Intravenous fluids upon which her blood pressure was then recorded to be 100/70 mm of Hg. Routine investigation was sent which revealed to have leucopenia, thrombocytopenia and mild infiltrated in lower zone of X-ray chest as shown in figure 1.

With suspicion of dengue fever due to leucopenia and thrombocytopenia, dengue antibodies were sent which came to be positive NS1 and dengue IgM. RT-PCR was sent before admission. Incidentally RT-PCR was also positive with CT value of 13. Thus, co-infection with dengue and SARS CoV-2 was confirmed and she was admitted in COVID ward. Related investigations were subsequently sent as shown in table 1. Besides leucopenia and thrombocytopenia there was derangement in liver enzymes with gradually improved with subsequent days.

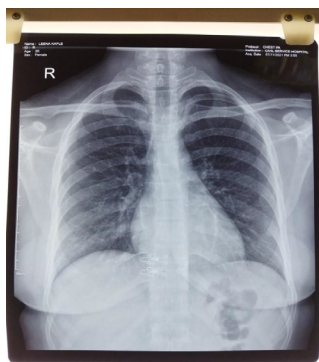


Figure 1: Chest X-ray showing bilateral lower lobe infiltration.(November 3, 2021)

Table 1: Laboratory values during ten days of admission

Day of admission		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
Laboratory	Reference value										
Hemoglobin (Hb) g/dl	14-18	12.6	12.4	12.1	11.8	12.5	12.6	13.6	13.5	12.6	12.5
White blood cell (WBC) cell/ul	4000-11000	2000	210	440	390	330	4200	4400	4200	4500	4300
Neutrophils%	40-75	45	35	35	27	26	35	40	55	52	55
Lymphocyte%	20-45	45	50	57	63	63	57	51	30	35	25
Platelet cell/ul	150000-400000	1150	820	390	550	720	1020	1550	1650	1620	1600
Aspartate transaminase (SGOT) U/L	<50			630	429	394	378	112	98	86	
Alanine transaminase (SGPT) U/L	<50			377	341	512	578	413	225	168	
Random blood sugar (RBS) g/dl	60-145	127									
Urea mg/dl	8-45	8		4	6						
Creatinine mg/dl	0.4-1.4	0.74		0.62	0.6						
Sodium mEq/L	135-145	132		144	138						
Potassium mEq/L	3.5-5.2	3.8		3.95	3.1						
RT-PCR TEST for SARS CoV2		Positive									
Dengue IgM antibody/ NS1		Positive									
CRP titre	<10	1.72									
d-Dimer mcg/ml	<0.5	1.12									
Procalcitonin ng/ml	<0.05	0.13									

Ultrasonography of abdomen and pelvis: minimal fluid in Pouch of Douglas (POD).

Urine culture and sensitivity: No growth was seen.

Blood culture and sensitivity: No growth was seen.

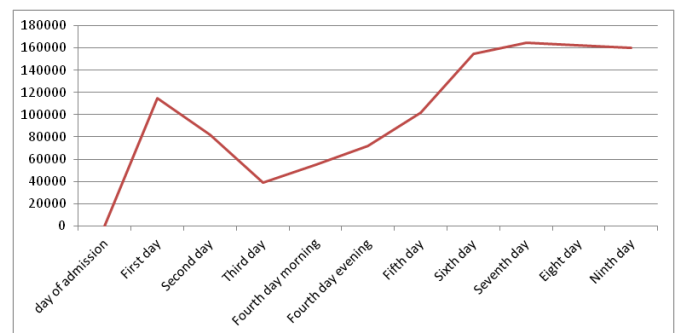


Figure 2: Changes in platelet count (in vertical axis /mm³) from the day of admission until discharge

The patient was kept in supportive treatment only. Targeted medicine like Remdesivir or Tocilizumab was not given. Patient’s general condition and symptoms gradually improved over days and she was discharged on ninth day of admission. She was advised to follow up after two weeks. She had no complaints and her laboratory reports were normal as shown in table 2.

Table 2: Follow-up laboratory profile of the patient

Laboratory	Reference value	November 26, 2021
Haemoglobin Hb (g/dl)	14-18	13.9
White blood cell WBC (cell/ul)	4000-11000	6000
Neutrophils%	40-75	63
Lymphocyte%	20-45	29
Platelet (cell/ul)	150000-400000	253000
Aspartate transaminase (SGOT) U/L	<50	28
Alanine transaminase (SGPT)U/L	<50	50

DISCUSSION

COVID-19 and dengue exhibit wide range of symptoms that coincide with each other. Therefore, it is quite challenging to differentiate them solely based on clinical symptoms. Herein we reported confirmed case of COVID-19 accompanied by Dengue infection without warning signs during second phase of outbreak of COVID-19 on November 2021. Patient presented with typical symptoms and chest X-ray features were highly suggestive of SARS CoV-2 infection which was confirmed by RT-PCR. However, we did not perform more sensitive computed tomography of chest due to COVID-19 presenting with mild symptom and had no co-morbidities as per Nepal Medical Council guideline 2020.⁴

Leukopenia with lymphopenia were found in early stage of dengue and COVID-19. In present case, progressive leukopenia with relative lymphocytosis were seen. These findings are similar to the test results of a 50-year-old woman with COVID-19 from Thailand.⁵ The platelet count was declined continuously until fourth day of admission along with progressive elevation of aminotransferases. However, the patient did not exhibit any hemorrhagic manifestations of dengue such as petechial hemorrhage, epistaxis, ecchymosis. These findings are different from the case of 62-year-old female from philipines.⁶ In contrary to dengue, COVID-19 is a hypercoagulable state with formation of micro thrombi in pulmonary and systemic circulation suggested by laboratory report showing high d-Dimer concentration.^{7,8} Thus, use of anticoagulant in COVID-19 cases co-infected with dengue infection is still in dispute.

In present case, the patients with COVID-19 have evidence of hepatocellular injury and liver function abnormalities. Increased serum aminotransferase levels were associated with COVID-19 and dengue disease severity and hepatomegaly.⁹ In present case, liver enzymes were progressively increased from second day of admission, similar to case of 42-year-old woman from Mexico.¹⁰ It was managed with conservatively and gradually declined after 6th day of admission.

Laboratory diagnosis of dengue in setting of COVID-19

pandemic is a tough nut to crack. Some reports revealed false Dengue antibodies positive in SARS COV2 infected patients.¹¹ Thus, either NS1Ag or Dengue RT-PCR should be performed in highly suspected cases along with isolation of suspected case while waiting for the report. However, it might be extremely challenging in resource limited setting during an outbreak. Confirmatory tests for Dengue NS1Ag and Dengue RT-PCR is not available in all tertiary center of Nepal.¹ Samples needed to be sent to either Sukra Raj tropical hospital or private labs which is time-consuming, inaccessible, non-affordable to majority of patients belonging to lower socio-economic background. As patient presented in well-equipped tertiary center in Kathmandu, once suspicious of SARS COV-2 co-infection with dengue all the necessary investigations were sent for early diagnosis of disease. Timely diagnosis of any disease is a key to prevention of hazardous complications. Diagnosis must be made based upon on clinical features, examination findings, laboratory profiles.

CONCLUSIONS

Co-infection of dengue and SARS CoV-2 infection has proven to serious health concern. Both have similar presentation and laboratory findings. However, treatment approaches are different. Early diagnosis and interventions are needed to prevent from serious complications.

CONFLICT OF INTEREST: None declared

SOURCE OF FUNDING: None

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