

CASE REPORT

COVID-19 AND DENGUE CO-INFECTION IN A YOUNG GIRL: A CASE REPORT

HOMAYRA TAHSEEN HOSSAIN¹, REFAYA TASNIM², HALIMA KHATUN³, NAW SABAH NOOR⁴, MAHBUB MAYUKH RISHAD⁵, QUAZI TARIKUL ISLAM⁶

Abstract:

During COVID-19 pandemic, the increasing incidence of dengue in Monsoon season has become a further threat especially in the dengue endemic countries of Southeast Asia like Bangladesh. Co-infection of dengue with COVID-19 has created a number of practical challenges to combat the diseases simultaneously, especially at a time when healthcare resources are already exhausted tackling the COVID pandemic. We are presenting the case report of a 14 year old girl who suffered from both RT-PCR positive COVID -19 infection & NS1 positive Dengue. She was managed in a Private Hospital of Dhaka as Dengue fever Group C (due to severe plasma leakage) with severe COVID-19 infection (as required oxygen therapy). She had a critical course of illness, having continued fever, cough, breathlessness, desaturation along with thrombocytopenia & plasma leakage. However, to our great satisfaction, the patient was ultimately improved & could be discharged in a happy face.

Key words: COVID-19 pandemic, dengue endemic, Co-infection.

Received: 18.09.2021

Accepted: 09.11.2021

DOI: <https://doi.org/10.3329/bjm.v33i1.56799>

Citation: Hossain MT, et al. COVID-19 and Dengue Co-infection in a Young Girl: A Case Report. Bangladesh J Medicine 2022; 33: 104-108.

Introduction:

Some Asian countries including Bangladesh are facing dengue outbreaks during this monsoon season amid the COVID-19 pandemic creating a double-burden on resources and health systems.¹ The heavy rains in this period cause a sudden spike in the Aedes mosquito population, which is the vector of dengue fever. Although COVID-19 & Dengue are caused by different viruses with different mode of transmission, co-infection of COVID-19 and dengue has already been reported from Asian countries such as Singapore, Thailand, India and Bangladesh.² As precautionary

measures for the COVID-19 pandemic, people are recommended to stay indoors which creates a higher risk of dengue infection in residential areas as Aedes mosquitoes are capable of breeding in households and feed mostly during the daytime. The Dhaka North City Corporation found that >60% of houses in Dhaka city were potential Aedes breeding grounds.³ Co-infection of Covid-19 and dengue can be very difficult to deal with, especially at a time when healthcare resources are exhausted tackling the COVID pandemic, with hospitals unable to take in any more patients unless the admitted ones recover or die.

1. Associate Professor, Medicine, Popular Medical College Hospital, Dhaka, Bangladesh.
2. Assistant Registrar, Medicine, Popular Medical College Hospital, Dhaka, Bangladesh.
3. Assistant Registrar, Medicine, Popular Medical College Hospital, Dhaka, Bangladesh.
4. Registrar, Medicine, Popular Medical College Hospital, Dhaka, Bangladesh.
5. Registrar, Medicine, Popular Medical College Hospital, Dhaka, Bangladesh.
6. Professor of Medicine, Popular Medical College Hospital, Dhaka, Bangladesh.

Address of correspondence: Dr. Homayra Tahseen Hossain, Associate Professor, Medicine, Popular Medical College Hospital, Dhaka. Email: homayra.tahseen@gmail.com

Copyright: © 2021 Associations of Physicians of Bangladesh

We are presenting the story of a 14 year old girl who suffered from both RT-PCR positive COVID -19 infection & NS1 positive Dengue within 10 days interval. She had a critical course of illness, having continued fever, cough, breathlessness, desaturation along with thrombocytopenia & plasma leakage; creating various challenges during management; which we wanted to share with all.

Case Summary:

A 14 year old girl presented with low grade fever for 2 days associated with anosmia .Her RT-PCR for COVID-19 became positive on 4th day of her illness. By that time, she became afebrile. As there were no other symptoms, she only maintained home isolation as a case of Mild COVID.

10 days later, the girl again developed fever. This time fever was high grade, continued in nature, highest recorded temperature 106°F, not associated with chills & rigor, not subsided by taking oral Paracetamol. She also complained about nausea, vomiting & bodyache. She was from Azimpur, Dhaka- an area with one of the highest cases of Dengue. Her Dengue NS1 antigen became positive on the first day of her this febrile episode. Being infected with 2 deadly viruses within a very short interval, her parents did not want to take any risk and got her admitted in a private hospital. On admission, her Temperature- 105°F, BP- 80/40 mmHg, Pulse- 112b/min, SpO2- 100% in room air. After initial resuscitation with I/V fluid , antipyretics & anti-emetics, she became haemodynamically stable but remain febrile. On admission, her CBC was normal with low normal platelet 1,70,000/cmm, liver function, renal function, CRP, D-dimer, HRCT chest were normal. But her IL-6 level was markedly raised (137.20pg/mL, normal up to 7pg/mL) Other than fever, as there was no other symptom, so no specific management was given other than fluid & anti-pyretic.

On 2nd day of admission, patient was hemodynamically stable, but her temperature was continuously high between 102°F - 104°F. Temperature did not touch baseline. **On 3rd day**, she developed loose motion 4-5times/day & her BP was 90/50 mm Hg. Both oral rehydration saline & I/V fluid was given to maintain her hydration. Her platelet count dropped to 85,000/mm³, Haematocrit 35.20% & she developed mild hypokalaemia.

On 4th day morning, patient started breathlessness. Loose motion persisted, but decreased in frequency. Patient was hemodynamically stable. Her SpO2 was 98-100% in room air, Respiratory rate was 18/min. Chest was clear. She was still febrile, but her platelet count further dropped to 40,000/mm³. Haematocrit was 36%. Chest X-ray was normal.

On 5th day, she developed cough along with her breathlessness. Cough was mostly dry, irritant in nature. Her nausea, vomiting & loose motion was improved. Still febrile, her Platelet count decreased to 30,000/mm³ with Hct 36.50%. There was no active bleeding & tourniquet test was negative.

On 6th day of admission, her fever, cough & breathlessness was deteriorating. She developed hypotension, BP 80/50 mm Hg. Chest examination revealed features of bilateral plural effusion (right> left) along with bilateral crepitations. Repeat HRCT of chest (Fig-01) showed diffuse ground glass opacity in all lobes of right lung which is consistent with COVID-19 pneumonia & bilateral moderate pleural effusion which is feature of plasma leakage of Dengue fever, despite her blood picture showed decreased HCT& rising platelet count to 50,000/mm³. Her AST level raised 3 times normal level & serum Albumin level also decreased to 2.59 gm/dl. Her CRP & procalcitonin level was normal, but serum Ferritin level came very high, 3610.3 ng/ml. We started broad spectrum antibiotic Inj. Ceftriaxone 2g- I/V 12

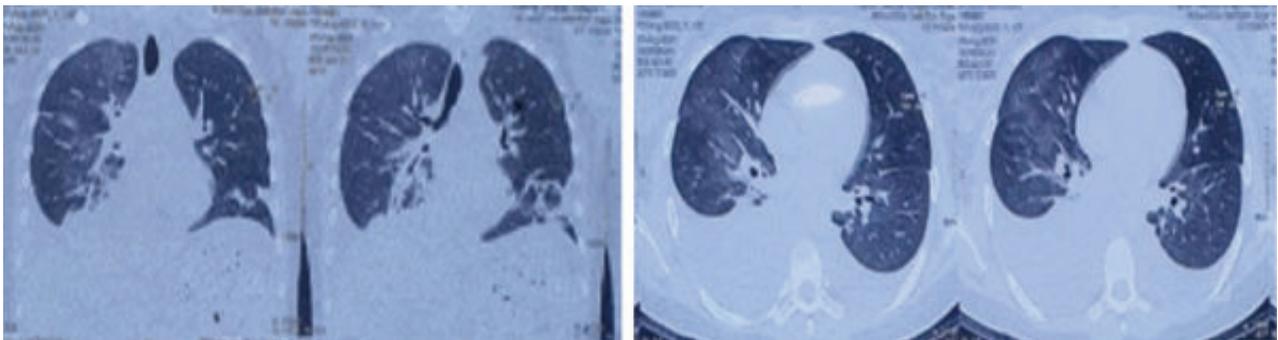


Fig.-1: HRCT chest on 6th day of Admission

hourly& Inj. Dexamethasone 5mg- 1amp I/V 12hourly. Inj 20% Human Albumin 100 ml was also given.InjRemdesivir 200ml Loading dose , followed by maintenance dose 100ml once daily for next 4days was added as HRCT chest revealed features of COVID pneumonia, despite it was her 12th day of COVID-19 infection as per RT-PCR report.Though she was only 14 years old, as her body weight was 60 kg, so we have given her adult dose of Remdesivir.

From 7th day morning,her SpO2 started to fall in room air for the first time & needed 4LO₂/min to maintain SpO2 95%. Breathlessness & cough was persistent. Temperature was 100°F throughout the day. Patient was symptomatically unstable, having continued fever, severe breathlessness, cough, desaturation.Patient’s O2 demand increased up to 10L/min at evening. Her chest X-ray (Portable) revealed a large homogenous opacity in the right chest along chest wall (Fig-02). Portable USG of W/A revealed- Mild to moderate ascites, Bilateral moderate pleural effusion, contracted Gall Bladder.CBC revealed TC: 14.55/ cmm,DC: N- 72%, L: 23%,Hb: 9.20 g/dL, HCT: 30.10%, Platelet: 125,000/cmm, ESR: 39 mm/Hr. As condition was deteriorating, treatment adjustment was done: Antibiotic was changed empirically from Inj. Ceftriaxone to Inj. Meropenem 1g – 1Vial I/V 8hourly& Tab. Moxifloxacin 400mg- 0+0+1.She had been treated as Dengue fever Group C (due to severe plasma leakage) with severe COVID-19 infection(as required oxygen therapy) with secondary bacterial pneumonia.

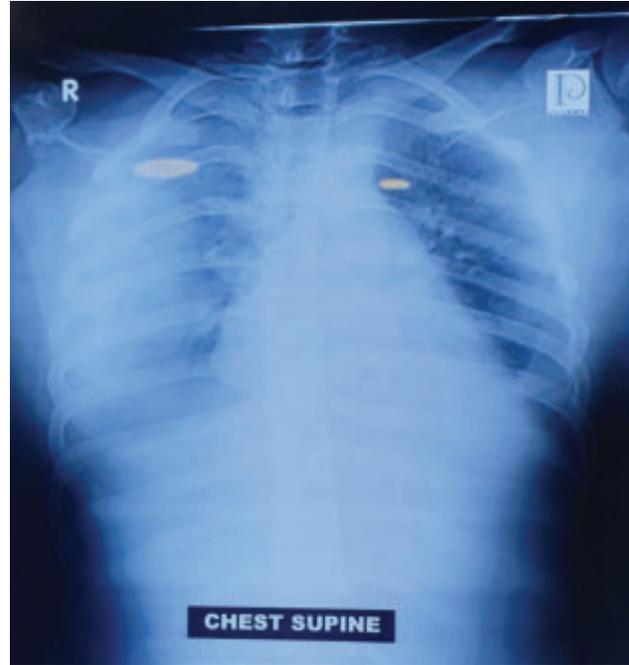


Fig.-2: CXR on 7th day of Admission

From 8th day of admission, Patient started to feel better, no new complains. Highest temperature was 100°F & touched baseline for the first time(Figure-03: Temperature chart). She was haemodynamically stable with only 1 litre of I/V maintenance fluid. Her O2 requirement decreased gradually from 10LO₂/min to 2LO₂/min. She developed generalized erythematous itchy rash typical of dengue during recovery period.

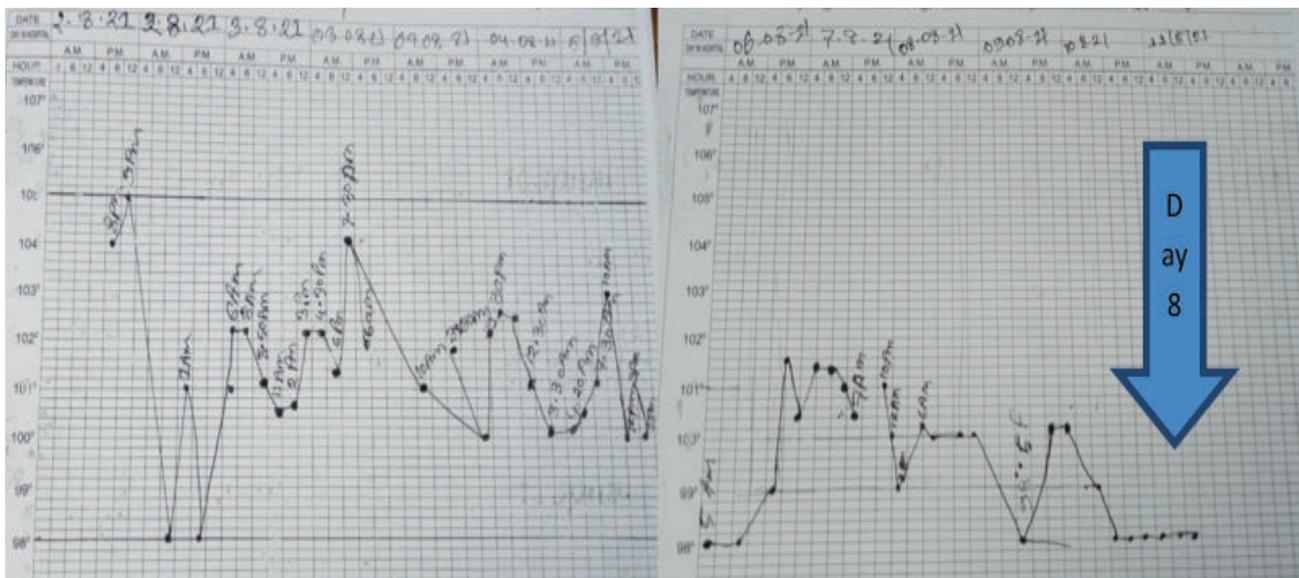


Fig.-3: Temperature Chart

From 9th day Morning, Patient became afebrile & normal temperature maintained throughout the day onward without any anti-pyretic support. Her cough & breathlessness was significantly improved. We started O2 free trial & SpO2 was maintained in room air. All laboratory parameters were improving including Chest X-ray (Figure- 04a). We reduced dosing of Inj. Dexamethasone 10mg OD to 7.5mg OD. No I/V fluid was given, encouraged her to take oral fluid in the form of ORS & fruit juice.

On 10th day, patient was stable & her Inj. Remdesivir dose was completed. She had been discharged on request with following treatment: Diet-Normal, ORS, Tab. Linezolid 600mg- 1+0+1 for 7days, Tab. Moxifloxacin 400mg- 0+0+1 For 07 days, Tab. Dexamethasone 4mg- 1+0+0 for 2days, Tab. Montelukast 10mg- 0+0+1 for 15days. She was advised to follow up after 7days.

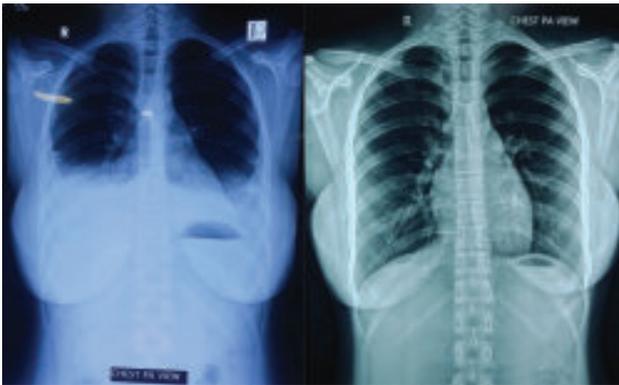


Fig.-4 : CXR (a) day 09, (b) 7 days of discharge

Patient came for **follow up** with her mother 7 days after discharge. She was stable; having no physical complain after discharge other than mild weakness & completed her advised medications. Her appetite was improved. CXR (Fig-04 b) was normal. All laboratory parameters were within normal limit.

Discussion:

Co-circulating and similar presentations of COVID-19 & dengue infection challenge the healthcare system in tropical countries like Bangladesh. Outbreak of dengue has posed a number of practical problems to combat the diseases simultaneously, like-

- **Diagnostic challenges:** Recent studies have provided evidence that dengue and COVID-19 have shared clinical and laboratory features that cause difficulty in early diagnosis and distinguishing among the patients^{4,5}. The onset of both diseases is manifested with fever. Dengue causes a sudden development of high fever, as

in our patient. COVID-19 cases show mild fever with respiratory illnesses. Nausea, vomiting, abdominal pain, and headache are some of the overlapping symptoms in both illnesses⁶. Our patient suffered from nausea, vomiting & loose motion along with respiratory symptoms.

- **Laboratory dilemma:** Cross-reactivity between DENV and SARS-CoV-2 lead to false-positive COVID-19 serology among dengue patients⁷. So confirmation by RT-PCR for COVID & NS1 Antigen for Dengue is essential, which we have done in our patient. Thrombocytopenia and elevated liver enzymes are also reported in both diseases. Thrombocytopenia and cytolysis were reported, respectively, in 36.2% and 21.3% of the patients with COVID-19⁸.
- **Management Challenges:** Thromboprophylaxis for COVID in presence of thrombocytopenia in Dengue should be used only when indicated. Can be used cautiously in patient with Platelet count >50 k/ μ L. In our patient, as there was no specific indication, so we did not use thromboprophylaxis. Another important issue in management is use of platelet apheretic instead of platelet concentrate when required. The lowest platelet count was 30,000/ mm^3 in our patient, but as there was no active bleeding, we did not advice for platelet transfusion.
- **Increased risk of Mortality:** In a study of co-infection of dengue & COVID-19 in Pakistan, it was found that there was 60% mortality in co-infected patients. This revealed the lower number of white blood cells, neutrophils, lymphocytes, and platelets in blood of co-infected patients, who eventually died at hospital⁹. We are lucky enough that our patient survived without any sequel.

We have met some particular challenges while treating this patient, like-

- Continuously decreasing platelet count during febrile phase of Dengue fever. So it was difficult to calculate the fluid requirement of critical period, which is supposed to be afebrile.
- Despite having low Haematocrit & within febrile phase, evidence of plasma leakage (pleural effusion, ascites) from Dengue fever
- Administration of Inj. Remdesivir during severe COVID-19 pneumonia, despite being on 12th day of infection, as there was progressive change of HRCT chest.

Conclusion:

During the COVID-19 pandemic, where dengue is endemic or patients with recent travel history to these areas, need to consider dengue and COVID-19 in the differential diagnosis of acute febrile illnesses. The clinical management for people who develop severe illness with either of these two diseases is quite different. Judicious use of fluid, anti-viral drugs, steroid & oxygen is very important according to individualized patient's requirement to save the precious lives.

Acknowledgments: The authors are grateful to all doctors and staffs of Department of Medicine, Popular medical College & Hospital Dhaka, Bangladesh.

Declaration of interest:

The authors report no conflict of interest.

Funding:

The author(s) received no financial support for the research, authorship, and/or publication of this article. The patient is aware that there is no patient identifiable information provided in the article and has consented to this publication. The clinical tests were all done as part of clinical practice.

References:

1. Harpan H, Ryan M, Yohan B, Nainu F, Rakib A et al. Covid-19 and dengue: Double punches for dengue-endemic countries in Asia. *Rem Med Virol* 2020b; <https://doi.org/10.1002/rmv.2161>. PMID: 32946149 PMCID:PMC7536968
2. Miah, M.A. and A. Husna, Co-infection, co-epidemics of Covid-19 and Dengue indengue endemic countries: a serious health concern. *J Med Virol*.
3. Newage Bangladesh. Spread of dengue feared as many patients go unreported 2020 (accessed September 5, 2020).
4. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet* 2020;395;507-13. [https://doi.org/10.1016/S0140-6736\(20\)30211-7](https://doi.org/10.1016/S0140-6736(20)30211-7)
5. Yan G, Pang L, Cook AR, Ho HJ, Win MS, Khoo AL, et al. Distinguishing Zika and dengue viruses through simple clinical assessment, Singapore. *Emerg Infect Dis* 2018;24;1565-8. <https://doi.org/10.3201/eid2408.171883>. PMID:30016242 PMCID:PMC6056111
6. DGHS. Guidelines, Directorate General of Health Services. 2020. Available from: <https://dghs.gov.bd/index.php/bd/publication/guideline> (accessed May 19, 2020)
7. Sri Masyenia, Marsha S. Santoso, Putu Dyah Widyarningsiha, DG Wedha Asmaraa, Firzan Nainud, Harapan Harapane, R Tedjo Sasmonoc. Serological cross-reaction and coinfection of dengue and COVID-19 in Asia: Experience from Indonesia. *International Journal of Infectious Diseases*. 102(2021) 152-154. <https://doi.org/10.1016/j.ijid.2020.10.043>. PMID:33115680 PMCID:PMC 7585717
8. Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, Liu L, Shan Lei CL, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med*. 2020;30; 382(18):1708-1720. <https://doi.org/10.1056/NEJMoa2002032> PMID: 32109013. PMCID:PMC7092819
9. Saddique A, Rana MS, Alam MM, IkramA et al. Emergence of co-infection of COVID-19 and dengue: A serious public health threat. *J of Infection*. 81(2020)e16-e18. <https://doi.org/10.1016/j.jinf.2020.08.009>. PMID:32800797 PMCID:PMC 7422859