

CASE REPORT

CHIKUNGUNYA AND CORONAVIRUS NL63: AN UNHEARD OF COINFECTION

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Abstract

Multiple viral infections are prevalent during monsoon season in Bangladesh. Therefore, coinfection is not uncommon. Here we report a 37-year-old male patient suffering from fever, joint pain, rash, loose motion, cough and runny nose. His investigations showed leucopenia with raised ESR and CRP. Chest imaging revealed tiny nodule in the lower lobe of left lung. Reverse transcriptase- polymerase chain reaction (RT-PCR) revealed viral ribonucleic acid (RNA) of both chikungunya and coronavirus NL63. The patient was treated conservatively and his condition improved.

Keywords: Chikungunya, Coinfection, Coronavirus NL63, Viral interaction

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Introduction:

There has been a resurgence of chikungunya cases in Bangladesh with around 337 cases being reported in the first 5 months of 2025.¹ Moreover, the hospital-based influenza surveillance (HBIS) data of Bangladesh showed that the flu season ranged from April to September with greatest incidence of influenza like illness occurring during the monsoon season, ie, in June and July.² When multiple viruses are prevalent, usually one virus prevents the replication of another virus.³ Such was the case seen in the recent COVID-19 pandemic when severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) inhibited the replication of multiple respiratory viruses.⁴ However, at other times coinfection can occur.³ Here we report a coinfection of chikungunya and coronavirus NL63 which according to the authors knowledge has not been previously reported.

Case report:

A 37-year-old non-diabetic, normotensive, nonsmoker gentleman presented with the complaints of high grade, intermittent fever for 4 days. The maximum temperature recorded was 103°F. His fever was

associated with chills & rigor and subsided with sweating after taking antipyretic. His condition was associated with bodyache but there was no headache, neck stiffness, convulsion, abdominal pain or burning sensation during micturition. He denied any recent travel history. He had been suffering from sudden onset of mild to moderate, non-progressive pain in right ankle joint that aggravated with rest and improved with activity for 4 days as well. Joint pain was not associated with joint swelling, redness, stiffness or restricted mobility. There was no history of trauma to the joint, excessive seafood intake or casual sexual exposure. There was a maculopapular rash located on the extensor surface of right leg, just above the ankle joint which was neither painful nor itchy and was not associated with any bleeding, oozing or blanching on pressure. He also complained of mild to moderate amount of loose motion for 2 days. The stool was semisolid in consistency, did not float on water and easily flushed away. Stool was not associated with mucous or blood. He also mentioned problems of occasional dry cough with runny nose for last few days. The cough neither had any aggravating or relieving

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factor nor any diurnal or seasonal variation. There was no history of chest pain, palpitation or shortness of breath. The patient suffered from coronavirus disease 2019 (COVID-19) 5 years back. There was no recent intake of medication other than a single dose of 500mg nitazoxanide that was taken after his loose motion started. His pulse was 95 beat/min, blood pressure was 120/70mmHg and temperature 100°F. Erythematous maculopapular rash was seen on the lower end of the right shien above the ankle joint that did not blanch on pressure. There was no swelling, tenderness or movement restriction of right ankle joint. Chest movement was symmetrical with vesicular breath sounds and no crepitation. No significant abnormality was detected in rest of the examination.

Some blood and urine investigations were done as shown in Table 1. The patient had leucopenia with mildly raised ESR and CRP. His chest Xray showed nodular opacities in both lung fields (Figure 1). Therefore, CT scan was done that revealed tiny ill-

defined nodule at the posterior segment of left lower lobe of lung (Figure 2). Keeping common viral infections endemic to Bangladesh in mind, multiplex polymerase chain reaction (PCR) of patient's serum was done to detect dengue, chikungunya or zika virus using Rotor-Gene Q PCR system by QIAGEN, Germany due to the features of fever, joint pain, rash and initial blood investigations. The result detected ribonucleic acid (RNA) of chikungunya virus. Considering the cough and imaging findings, respiratory panel assay from nasopharyngeal swab was also sent for real time PCR, which used the same method. Coronavirus NL63 was detected.

Even though the patient had coinfection with chikungunya and coronavirus NL63, his symptoms were not severe in nature and also did not progress. He was treated conservatively with oral fluids, rest, paracetamol and antihistamine. His condition gradually improved with no residual complications.

Table I
Initial investigations of the patient

Investigation	Result	Normal values
Complete blood count		
Haemoglobin	12.8 mg/dl	13-17 mg/dl
Total count	3,510/mm ³	4,000-10,000/mm ³
Platelet count	1,78,000/mm ³	1,50,000-4,10,000/mm ³
ESR	26 mm/h	0-10 mm/h
CRP	7.25 mg/L	< 5 mg/L
Serum creatinine	1.19 mg/dl	0.7-1.2 mg/dl
Serum electrolytes		
Sodium	142 mmol/L	136-145 mmol/L
Potassium	4.2 mmol/L	3.5-5.1 mmol/L
Chloride	105 mmol/L	98-107 mmol/L
Bicarbonate	26 mmol/L	22-28 mmol/L
ALT	27 U/L	< 41 U/L
AST	23 U/L	< 40 U/L
Blood culture	No growth	
Uric acid	6 mg/dl	3.5-7.2 mg/dl
Urine routine examination		
Epithelial cell	1-2/HPF	0-5/HPF
Pus cell	1-2/HPF	0-5/HPF
RBC	Nil	0-2/HPF



Figure 1. Chest X-ray (posteroanterior view) showing bilateral nodular shadowing in both lung fields



Figure 2. CT scan of chest showing tiny ill-defined nodule (arrow) at the posterior segment of left lower lobe of lung

Discussion:

Coinfection of chikungunya with dengue, zika, malaria and even coronavirus like severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) have been reported.^{5, 6} Similarly, dual infection of coronavirus NL63 with respiratory syncytial virus, human metapneumovirus, influenza viruses, parainfluenza virus, SARS-CoV-2 and other coronaviruses have been seen previously.^{7, 8} Here we have described a case of coinfection with chikungunya and coronavirus NL63. Even after extensive search using the keywords “coinfection” and “chikungunya” and “coronavirus NL63” in PubMed, Cochrane library, Google Scholar and ResearchGate, no other similar cases of such coinfection could be found. Prompt like “Are there any

reported cases of coinfection with chikungunya and coronavirus NL63” was given in artificial intelligence (AI) tools like copilot and chatgpt that also yielded no results. Therefore, this is probably the first reported case of such a coinfection.

Viral-viral interactions during coinfections commonly follow 3 patterns – interference, synergy and noninterference.³ In viral interference, already explained above, the growth of a virus is inhibited by another virus as seen in human immunodeficiency virus (HIV) and hepatitis C virus (HCV) coinfection, where interferon induced by HIV reduced the viral load of HCV.⁹ In contrast, viral proliferation due to effect of another virus is called viral synergy. For example, enhanced growth of influenza A virus (IAV) was seen in dual infection with human parainfluenza virus type 2 (hPIV2) due to increased cell fusion activity by the virus.¹⁰ When there is no effect on viral replication, it is known as viral noninterference, which usually occurs due to different tissue tropisms of the viruses like that seen in IAV and human papillomavirus (HPV) coinfection.³ Based on different tissue targets – fibroblasts, muscle cells, macrophages, osteoblasts or chondrocytes for chikungunya¹¹ while respiratory epithelial cells for coronavirus NL63¹² – and non-severe symptoms of our patient, the viral interaction between chikungunya and coronavirus NL63 maybe of non-interference type. However, further research is required to know a definite viral interaction.

Viral coinfection can have effect on viral transmission and pathogenicity.³ While dengue virus serotype 2 and dengue virus serotype 4 coinfection showed reduced spread of the virus in mosquito cells, chikungunya coinfection with zika virus in mosquito led to increased transmission of zika virus infection.³ With regards to pathogenicity, increased liver cirrhosis and mortality occurred with hepatitis B virus (HBV) and HCV coinfection.¹³ However, coinfection does not always augment pathogenicity, it may even have no effect and sometimes have beneficial outcome as well. There was no association on mortality with IAV and SARS-CoV-2 coinfection.³ Rhinovirus has been shown to alleviate the severity of IAV by quicker viral clearance and inflammatory response.¹⁴ Chikungunya can lead to chronic arthritis and coronavirus NL63 can cause complications like alarming lower respiratory tract infection and bronchiolitis.^{7, 15} Our patient did not have severe symptoms and responded well to supportive management with no complications. More study is needed to explore whether coinfection with chikungunya and coronavirus NL63 have any effect on reducing complications.

An important learning from this case is to pay close attention to the clinical features and investigation reports of a patient otherwise the diagnoses can be missed. While fever, joint pain and rash are common symptoms of chikungunya¹⁵ that were present in our patient, cough and imaging findings of the chest were not consistent with chikungunya. Short duration of fever, cough, and runny nose with changes in chest imaging prompted further investigation for respiratory tract infection. If the respiratory panel assay was not done then the concomitant coronavirus infection would not have been diagnosed. Therefore, it is imperative to address all the problems of a patient for appropriate clinical management.

Conclusion:

We have highlighted the first case of chikungunya and coronavirus NL63 coinfection. The presenting symptom appears to be mild with no complications. The patient improved with supportive management.

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We acknowledge the co-operation patient for consenting to the publication of her clinical information

Data Availability Statement:

Any inquiries regarding supporting data availability of this study will be made available by the corresponding author, without undue reservation and upon reasonable request.

Consent of participant:

Informed written consent was obtained from the patient. All procedures and methods were performed in accordance with the appropriate regulations.

Disclosure:

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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