

COVID-19 and Zika: An emerging dilemma for Brazil

Dear Editor,

Brazil is currently facing one of the biggest public health crises in its history. It is widely accepted that the coronavirus disease 2019 (COVID-19) pandemic is testing the resilience of health systems as the demand for resources, laboratories, and task force allocation is increasing, as well as the number of cases requiring hospitalization in intensive care units (ICU). In addition, the fact that residues from previous epidemics caused by arboviruses—such as the Zika virus (ZIKV)—coexist in Brazil increases the burden health sector in the country.

The outbreak of Zika infection began in Brazil in 2015, quickly reaching many cases due to lack of access to water, sanitation, and unequal access to health care for the most impoverished families.¹ In 2019, a total of 10 768 plausible cases of Zika infection were identified in Brazil.² A few months later, in February 2020, the health system was severely hit by the first cases of COVID-19 in the country. The absence of stricter social distance measures made the disease spread more quickly in Brazil, placing the country as one of the most affected nations in the world, with more than 270 thousand deaths and 10 million COVID-19 cases in early March 2021.³

As the contagion curve of coronavirus grows sharply, the pandemic increases the burden already imposed by Zika on the Brazilian public health system. The similarities in the clinical presentations of these two diseases, illustrated in Table 1,³⁻⁷ aggravate this situation since the initial stages of Zika correspond to the clinical manifestations of SARS-CoV2 infection, makes the diagnostic approach more difficult. Therefore, there may be a delay in diagnosis and appropriate treatment, worsening clinical outcomes and potentially increasing the spread of infection. Diagnostic delay due to overlapping symptoms of COVID-19 and other infectious diseases, such as Dengue,⁸ and Typhoid fever,⁹ has also been reported in India and Pakistan, where the similarity between COVID-19 symptoms and these diseases has led to their underdiagnosis.

The deterioration of the clinical picture in both cases, due to the delay in the start of treatment, may require monitoring employing numerous complementary tests, such as monitoring the levels of hematocrit and platelet count, which puts the capacity of the laboratories in difficulty, concerning the shortage of reagents, facilities and human resources.¹⁰

Besides, there is the fact that both diseases can present as a co-infection, which can lead to underdiagnosis of Zika after a positive diagnostic test for COVID-19. This is mainly because many laboratories have redirected all their efforts to diagnose coronavirus, which has directly impacted on the detection of arboviruses. In addition, it is important to highlight that the pandemic has weakened the

surveillance and epidemiological and entomological control services for arboviruses and their vector, due to the redirection of efforts to control COVID-19. Thus, although 7387 cases of Zika were registered in Brazil in 2020, the actual numbers may be much higher.¹¹

Associated with this is that the weakening of entomological control services for the *Aedes Aegypti* mosquito can cause not only the worsening of the epidemiological picture of Zika in the country, but also that of other arboviruses transmitted by the same vector, such as dengue and Chikungunya. In relation to dengue, after years of falling number of cases, since 2019 the country has faced another increase in the incidence of the disease, having reached the mark of more than 2 million cases in that year.¹² Chikungunya, initially diagnosed in the country in 2014, quickly spread throughout Brazil, reaching 132 205 cases in 2019. Therefore, the hypothesis is raised that, like Zika, the drop in the number of dengue and chikungunya cases in 2020, achieving respectively, 987 173 and 82 419 cases,¹¹ is mainly due to the aforementioned effects of the pandemic on the health system, such as the underdiagnosis of diseases with symptoms similar to COVID-19.^{13,14} Therefore, the epidemiological situation of arboviruses in the country can be much more serious than the data from the latest epidemiological bulletin indicate.

Consequently, ICU will be challenged since the incidence of the arboviruses and its complications is increasing simultaneously with the need to accommodate patients with severe SARS-CoV-2. As reported, the possibility of patients with COVID-19 presenting with severe acute respiratory syndrome resides in 15%.¹⁵ In contrast, ZIKV contamination during pregnancy, for example, can cause microcephaly and other intrinsic conditions in newborn children.

It is also worth mentioning that recently, researchers identified a new African strain of the ZIKV that was first detected in Brazil.¹⁶ It is predicted that most people will not have antibodies against this new strain of Zika, and, therefore, this new strain represents a massive threat to the resurgence of the Zika epidemic in Brazil.

The synchronous existence of arboviruses and the global pandemic in Brazil requires urgent action, especially with regard to disease control measures and successful screening techniques for the correct diagnosis. Many cases of Zika infection have been misdiagnosed or underreported due to unspecific clinical presentation. Failure to capture the actual epidemiological image does not allow the development of an adequate response and, without proper leadership, control and prevention of both COVID-19 and Zika would be impossible.

To deal with the situation, health awareness campaigns aimed at the general public, especially the population most affected and at greatest risk for both diseases, are also needed. With regard to

TABLE 1 Summary of clinical representation similarities between COVID-19 and Zika

Clinical presentations	COVID-19	Zika
Fever ^{4,5}	✓ (78.8%)	✓ (43%)
Fatigue ⁴	✓ (32.2%)	
Headache ^{4,5}	✓ (9.7%)	✓ (60%)
Rash ^{5,6}		✓ (95%)
Pruritus ⁵		✓ (66%)
Shortness of breath ⁴	✓ (18.99%)	
Cough ^{4,5}	✓ (53.9%)	✓ (36%)
Myalgia ^{4,5}	✓ (21.3%)	✓ (53%)
Chest pain ⁴	✓ (9.0%)	
Sore throat ^{5,6}	✓ (12%)	✓ (36%)
Expectoration ⁴	✓ (24.2%)	
Arthralgia ^{5,6}	✓ (11%)	✓ (66%)
Hypogeusia ⁶	✓ (4%)	
Hyposmia ⁶	✓ (25%)	
Conjunctivitis ^{5,6}	✓ (2%)	✓ (10%)
Gastrointestinal symptoms (Abdominal pain, nausea, vomit) ^{5,7}	✓ (12%)	✓ (41%)

Abbreviation: COVID, coronavirus disease 2019.

COVID-19, it is necessary to reinforce the importance of adherence to social distance and hygiene measures. In relation to arboviruses, it is necessary to prevent the transmission of the virus and to fight vector mosquitoes through simple measures, such as regular emptying and cleaning of water containers and fumigation throughout the community. Health professionals must also be trained in the early and more reliable detection of cases. Dual laboratory examination protocols can be adopted in cases where there is a greater suspicion of coinfection by Zika and COVID-19, to avoid underdiagnosis of one of the diseases. Only with better health planning and management will it be possible for Brazil to ease the health system's burden and overcome the difficulties arising from both epidemics.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

AUTHOR CONTRIBUTIONS

Ana Carla dos Santos Costa, Mohammad Mehedi Hasan, and Mohammad Yasir Essar developed the concept for this letter. Ana Carla dos Santos Costa, Mohammad Mehedi Hasan, Eleni Xenophontos, Parvathy Mohanan and Esther Edet Bassey wrote the first draft. Ana Carla dos Santos Costa and Mohammad Mehedi Hasan edited the second draft. Hashim Talib Hashim, Shoaib Ahmad and Mohammad Yasir Essar made the critical comments and revision. All authors revised and approved the final draft.

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