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Brief Communication

New Brazilian variant of the SARS-CoV-2 (P1/Gamma) of COVID-19 in Alagoas state

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ABSTRACT

Since the beginning of 2020, health authorities have been monitoring the cases of Coronavirus Disease 2019 (COVID-19), which has grown every day in Brazil and around the world, becoming pandemic. The new coronavirus, also called SARS-CoV-2 by scientists spreads rapidly, causing fear, deaths, and threats for the economy of several countries. This work aimed to describe the clinical characterization of the first cases of a new Brazilian variant of SARS-CoV-2 (P1) in the State of Alagoas, which occurred on February 16th, 2021. Two cases are described: first, a person infected in Amazonas State, where the new variant P1 was first described, who migrated to Alagoas State, and second, a case of probable community transmission within Alagoas, since the patient had no history of recent travel. In both confirmed cases the symptoms were mild. Further studies are necessary to better understand the clinical behavior of P1 SARS-CoV-2 variant and also the associated sequelae in the context of COVID-19.

The Coronavirus Disease 2019 (COVID-19) has shown to be a disease that may quickly evolve to severe conditions, including death, especially in older people, who are more susceptible to SARS-CoV-2 infection.[1–5] The COVID-19 virus spreads quickly from person to person, starting clinically as a flu-like syndrome, which may progress to an acute viral pneumonia and severe acute respiratory syndrome, in which there is a need for artificial ventilatory support. On the other hand, autopsies of patients who died from COVID-19, and also

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animal models, have shown serious histopathological injuries of the systems. In addition, people who survive from severe infectious have shown sequelae, as respiratory conditions, among others.[5–11]

Studies suggest that expression of ACE2 cellular proteins and TMPRSS2 protease in the olfactory epithelium cells are involved in viral access to the human body and detection in oropharyngeal secretions.[2,12] Since ACE2 proteins seem to be expressed in significantly higher levels in older people, this may explain the greater susceptibility of this age group to infection.

Experiments using machine learning models based on algebraic topology, evaluated the possible changes in the relation between COVID-19 virus and angiotensin 2-converting enzyme receptor host, after confirmation of virus mutations.[10] In this way, studies indicate a higher ability of the mutated virus to infect humans, who will have greater difficulty to control its replication.[13–15] Researchers have shown that three among six SARS-CoV-2 subtypes have become slightly more infectious, while the other three subtypes have significantly strengthened their infectiousness, bringing greater risks of illness to the general population.[10,13,16,17]

This is a descriptive cross-sectional study using public infographics data from the Center for Strategic Information and Response in Health Surveillance, of the Health Department of the State of Alagoas (CIEVS/SESAU/AL). This project was initially approved by the research ethics committee of the Federal University of São Paulo (UNIFESP) under the CAAE 37172620.0.0000.5505. For public data collection, updated epidemiological reports were daily accessed through the CIEVS/SESAU/AL website. Patient samples were confirmed by RT-PCR according to the Central Public Health Laboratory - LACEN and associated to the virus genetic sequencing at Oswaldo Cruz Foundation (FIOCRUZ). Data were available in the Informative Note SUVISA No. 07/2021, of February 17th, 2021.

The diagnosis of the first two cases of the new SARS-CoV-2 variant in Alagoas State occurred on February 16th, 2021. The first case was of a person infected in the Amazonas State who migrated to Alagoas State. The second case is characterized by community transmission within Alagoas. The confirmation of the new variant was carried out by the reference national laboratory (Laboratory of Respiratory Viruses and Measles, from FIOCRUZ-RJ), which, upon receiving positive samples confirmed by LACEN's RT-PCR, performed the virus genetic sequencing. After confirmation, state authorities where the virus had emerged, were immediately informed for virus variant monitoring procedures in that region. Patients G#1 and G#2, respectively with and without travel history to the Amazon, were diagnosed with the P1 variant of the new coronavirus either in the prodromal state period of COVID-19 or immediately after. G#1 was a 36-year-old female, with history of three days exposure to family members in the Amazon region. The woman gradually evolved to a flu-like condition associated with dyspnea and cough symptoms and was instructed to do family isolation after positive test for SARS-CoV-2 (Table 1). A patient sample was sent to Oswaldo Cruz Foundation (FIOCRUZ) for virus sequencing. After being informed about the new variant, the Brazilian Ministry of Health recommended virus genetic sequencing of individuals suspected of COVID-19 contamination and history of travel to Amazon. Government officials also instructed the submission of randomly and systematically positive samples of SARS-CoV-2 to carry out genetic sequencing and possible virus monitoring.

Table 1 – Characteristics of patients with confirmed infection with SARS-CoV-2 P1 variant.

Sex	G#1 Female	G#2 Female
Age	36	64
Travel to Manaus (last month)	Yes	No
Positive RT-PCR	Yes	Yes
Allochthonous cases	Yes	Yes
Countryside	Yes	Yes
Genetic sequencing	Yes	Yes
Cough	Yes	Yes
Coryza	No	Yes
Myalgia	No	Yes
Softness	No	Yes
Dyspnea	Yes	No

The second case was a 64-year-old female, living in Alagoas State and with no history of recent travel or contact with persons from any other State, when the presence of the new circulating variant had been already confirmed in Amazonas. In this woman, P1 variant infection was also confirmed by genetic sequencing exam. The symptomatic picture of this patient was characterized as mild, as in G#1 patient; however, symptoms as recurrent cough, slight coryza, myalgia and physical asthenia were also observed (Table 1). Onset of symptoms began on January 19th, 2021 with test confirmation on next 25th, probably on the post-prodromal period. P1 virus seems to be more transmisible, is associated with higher viral loads, and posible reinfections.[18,19] Epidemiological investigation indicates that these cases (G#1 and G#2 patients) were characterized as allochthonous cases, meaning that the virus was imported from another state.

The P1 SARS-CoV-2 variant found in Alagoas, which might be probably circulating in the state nowadays, is derived from the B.1.1.28 lineage, present in Brazil. This new strain contains a unique composition of mutations in the spike protein, responsible for the entry of the virus into human cells. Studies indicate that this new variant has greater transmission capacity, even though it is not associated with more severe clinical conditions in relation to the original strain.

The new coronavirus has caused deaths and losses to the Alagoas State economy and also to the country and world, as well. On the other hand, low population adherence to social distance associated with poor health care and no proper prevention measures during the pandemic have contributed to an increasing incidence of the new variant. In the same way, the beginning of the seasonal period of respiratory diseases associated to the presence of both the ancestral SARS-CoV-2 and the P1 variant may increase the risk of respiratory infections, death or even aggravate the situation of collapsing hospital care.

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