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Research Article

Positivity Comparison Between Test Results for Covid-19 During Voc - (Variants of Concern) in a Laboratory of Ribeirão Preto

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Abstract

The disease caused by (SARS-CoV-2), had a devastating effect on the world population. The study aims to analyze the number of positive tests compared to periods other than the Covid-19 correspondent pandemic to the periods of VOCs declared by the WHO. Using observational analytical methodology, through reports from a laboratory of the private health network located in the interior of São Paulo, from December/2020 to March/2022 with the data organized and statistically analyzed, the percentage of positivity of the tests was evaluated of covid with the periods of the VOC's. According to data from Fiocruz, from December 2020 to July 2021 in the state of São Paulo, there was a predominance of the gamma line (P1 R1). In this period, 12,982 exams were performed with an average positivity of 21.66%. In the period of prevalence of the delta lineage, there were a total of 3803 exams with an average positivity of 8.72%. In view of the emergence of the new Omicron variant, a total of 9107 tests were carried out from December 2021 to March 2022. The average positivity of the tests, 26.51%, however in January the record was recorded 46.67% of positive tests out of a total of 4905 tests.

Vaccination significantly reflected in the progress of VOC's. However, as described in the literature and in line with national perception, there was a significant increase in the number of cases and positivity in the Omicron sline, peaking in January 2022. Although the Covid-19 is in decline, attention to thesution of new variants is still necessary and of utmost importance.

Keywords: COVID-19; SARS-CoV-2; Worrying Variants

Introduction

In December 2019,a pandemic of coronavirus disease (COVID-19) that began in Wuhan, China hitting the world [1]. The disease caused by coronavirus [2] of severe aguerespiratory syndrome (SARS-CoV-2), had a devastating effect on the world population [2]. As of March 2022, there were more than 511 million cases worldwide and more than 6 million deaths worldwide. In Brazil until the same date we had more than 30 million cases and about 660,000 deaths [3]. These data illustrate why this disease is the most significant global health crisis since the 1918 influenza pandemic [2].

Like other RNA viruses, SARS-CoV-2, although it adapts to its new human hosts, is prone to genetic evolution with the development of mutations over time, resulting in mutant variants that may have different characteristics of their ancestral strains [4]. Several variants of SARS-CoV-2 have been described during this pandemic, among which only a few are considered variants or (VOC (Variants of Concern), due to its impact on global public health. Based on the recent EPIDEMIOLOGICAL UPDATE of the WHO, on December 11, 2021, five SARS-CoV-2 COVs were identified since the beginning of the pandemic [4].

- Alpha (B.1.1.7): First variant of concern described in the UK (UK) at the end of December 2020

- Beta (B.1.351): First reported in South Africa in December 2020
- Gama (P.1): First reported in Brazil in early January 2021
- Delta (B.1.617.2): First reported in India in December 2020
- Omicron (B.1.1.529): First reported in South Africa in November 2021 [4].

The VOCs have higher transmissibility compared to the original virus and have the potential to increase the severity of the disease. In addition, VOCs exhibit decreased susceptibility to vaccine-induced and infection-induced immune responses and, therefore, have the ability to reinfect previously infected and recovered individuals [4].

Since the emergence and which was declared to a global pandemic by the World Health Organization (WHO) on March 11, 2020, a wide variety of diagnostic trials has been developed in order to test the population in a global and collective effort to contain the advance of SARCOV-2 [5]. These assays mainly use real-time quantitative reverse transcription polymerase chain reactions (qRT-PCRs) that detect viral RNA. Due to their high sensitivity and specificity, qRT-PCRs act as the gold standard for the diagnosis of COVID-19, another diagnostic assay is the rapid antigen detection test (RDT). RDTs can be performed at home, producing results in a few hours [1]. In a disease with extreme contamination capacity and high index of uncertainties, the diagnostic question was fundamental to establish protective, prophylactic and clinical decisions. The study aims to compare the number of positive tests for COVID-19 in a laboratory in Ribeirão Preto, Sao Paulo with the VOC (Variants of Concern).

Methodology

The methodology used in the study was observational and analytical. With the monthly reports of the results obtained for COVID-19 from December 2020 to February 2022 in a laboratory of the private health network Ribeirão Preto. The results were organized and divided into positive and negative results for COVID-19. Results described as indeterminate were not found. The tests included in the data were the molecular test for the detection of SARS-CoV-2 coronavirus, the molecular test with isothermal amplification (id nowrt-pcr) for the detection of the SARS-CorV-2 coronavirus, and the qualitative detection of SARS-Cantigens theV-two. The data were plotted in the excell power BI program, for graphic evaluation of the data. The percentage of positive tests in relation to the total number of exams was used for comparison with the periods of predominance of VOCs.

Conclusion

Regarding the evaluation of the results, what can be seen is the decrease in the number of tests performed, as well as the positivity rate in the period correlated with the Delta variant in relation to the Gamma variant. This drop may be related to the vaccination that started in the state of São Paulo in January 2021. Vaccination significantly reflected the advancement of VOC's. However, there was a significant increase in the number of cases and positivity in the Omicron lineage, peaking in January 2022. The constellation of more than 50 mutations, at least 32 in the spike protein, made it highly transmissible.

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