

SARS-CoV-2 VOC 202012/01(B.1.1.7) Variant: Is it More Dangerous?

SARS-CoV-2 VOC 202012/01(B.1.1.7) Varyantı: Daha mı Tehlikeli?

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Öz

Amaç: Bu çalışmada; SARS-CoV-2'nin İngiltere Varyantı (VOC 202012/01-B.1.1.7) ile enfekte olan hastaların demografik ve klinik özelliklerinin saptanması ve İngiltere Varyantı olmayan SARS-CoV-2 ile enfekte hastalarla karşılaştırılarak farklılıkların ortaya konması amaçlanmaktadır.

Hastalar ve Yöntem: Konya ili'nde 02-11 Şubat 2021 tarihleri arasında PCR testi pozitif olarak sonuçlanan ve varyant analiz sonucu VOC 202012/01 (B.1.1.7) olan 671 vaka ile aynı tarihler arasında PCR test sonucu pozitif olan ve varyant olmayan 2284 vakanın, Sağlık Bakanlığı Halk Sağlığı Yönetim Sistemindeki (HSYS) kayıtları 24.02.2021 tarihi baz alınarak taranmıştır. Yapılan taramada yaş, cinsiyet, temaslilik durumu, daha önce COVID-19 geçirme durumu, hastaneye ve yoğun bakım ünitesine yatma durumu, yatış süresi, entübasyon ve exitus durumları kaydedilmiştir.

Bulgular: Varyant varlığı/yokluğuna göre hastanede yatış durumu arasında istatistiksel olarak anlamlı fark yoktu ($p=0,234$). Varyant pozitif olan hastaların %1.9'u, varyant pozitif olmayanların ise %3.9'u yoğun bakım ünitesine yatırıldı. Varyant pozitif olmayan hastalarda YBÜ'ye kabul oranı, pozitif olanlara göre anlamlı olarak daha yüksekti ($p=0,013$).

Sonuç: Bu çalışmanın bulguları ışığında SARS-CoV-2 VOC 202012/01(B.1.1.7)'nin hastaneye yatış ve yoğun bakıma yatış açısından daha tehlikeli olmadığını söylemek mümkündür.

Anahtar Kelimeler: Covid-19, B.1.1.7, varyant, VOC

Abstract

Aim: This study aimed to determine the demographic and clinical characteristics of patients infected with the VOC 202012/01-B.1.1.7 variant of SARS-CoV-2 and to compare these patients with those infected with other variants of SARS-CoV-2, in order to demonstrate the differences.

Patients and Methods: Records of 671 patients with VOC 202012/01 (B.1.1.7)(VOC+) who tested positive in the PCR (polymerase chain reaction) test, between February 2–11, 2021 in Konya Province, and were found to have the VOC 202012/01 (B.1.1.7), according to variant analysis and 2284 (VOC-) patients who also tested positive in the PCR test between the same dates but did not have the variant (VOC-) were screened in the Public Health Administration System of the Turkish Ministry of Health, on February 24, 2021. Age, gender, hospitalization status, and admission to the intensive care unit (ICU) were recorded from the screening results.

Results: There was no statistically significant difference between hospitalization status, according to the presence/absence of the variant ($p=0,234$). Of the patients who were variant-positive and those who were not, 1.9% and 3.9% were admitted to the ICU, respectively. The rate of admission to the ICU was significantly higher for patients who were not positive for the variant as compared to those who were ($p=0,013$).

Conclusions: In the light of the findings of this study, it is possible to state that SARS-CoV-2 VOC 202012/01(B.1.1.7) is not more dangerous in terms of hospitalization and admission to the ICU.

Key words: Covid-19, B.1.1.7, variant, VOC

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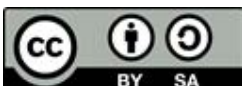
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INTRODUCTION

As of March 30, 2021, the world has been greatly affected by the Coronavirus disease (COVID-19) pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), with 128 million cases and 2.8 million deaths (1). A total of 2,492,977 cases and 31,385 deaths have been reported in Turkey so far (2).

Since the onset of the pandemic, multiple variants of SARS-CoV-2 have been observed throughout the world. Variants of concern (VOC) have been defined based on evidence of increased transmissibility, disease severity, and the ability to evade immunity provided by previous infections or vaccines. The VOC 202012/01 (B.1.1.7), which was first detected in the UK, has spread rapidly worldwide. The transmission rate of the virus was estimated to be 43%–90% in early February 2021, when the aforementioned variant became the predominant one in the UK and constituted 95% of the cases (3-5). This rate is evidently higher than the transmission rate of the SARS-CoV-2 strain that already existed in other countries, such as the United States (4).

The VOC 202012/01(B.1.1.7) was first detected on September 20, 2020 in the UK, after which it was identified in Turkey on January 1, 2021, approximately three months later (6, 7). This date onward, the number of cases increased from 15 to 128 on January 29, 2021. It was reported that the patients with this variant constituted 75% and 85% of all cases on March 30 and April 12, 2021, respectively (7).

At this stage in the pandemic, demonstrating whether this variant of SARS-CoV-2 would pose a danger in terms of exceeding hospital capacity, considering its virulence and the demographic characteristics of the patients affected, would contribute to the fight against the pandemic.

In this study, it was aimed to determine the demographic and clinical characteristics of patients infected with the VOC 202012/01-B.1.1.7 variant of SARS-CoV-2 and to compare these patients with those infected with other variants of SARS-CoV-2, in order to demonstrate the differences.

PATIENTS AND METHODS

Records of 671 patients with VOC 202012/01 (B.1.1.7)(VOC+) who tested positive in the PCR (polymerase chain reaction) test, between February 2–11, 2021 in Konya Province, and were found to have the VOC 202012/01 (B.1.1.7), according to variant analysis and 2284 (VOC-) patients who also tested

positive in the PCR test between the same dates but did not have the variant (VOC-) were screened in the Public Health Administration System of the Turkish Ministry of Health, on February 24, 2021. Age, gender, hospitalization status, and admission to the intensive care unit (ICU) were recorded from the screening results. Patients who completed the ten-day isolation period according to the COVID-19 Guidelines published by the Turkish Ministry of Health, were included in the study.

This study was performed in accordance with the Declaration of Helsinki and was approved by the Ethics Committee (2021/019).

Statistical Analysis

The research data was analyzed using SPSS (Statistical Package for the Social Sciences) for Windows 22.0 (SPSS Inc, Chicago, IL). Descriptive statistics were expressed with median [interquartile range (Q1-Q3)], frequency distribution, and percentage values. Pearson's Chi-Square Test was used to evaluate categorical variables. Normality of distribution was analyzed using visual (histograms and probability graphs) and analytical (Kolmogorov–Smirnov Test) methods for all variables. For variables that were not normally distributed, the Mann–Whitney U Test was used as the statistical method to compare two independent groups and assess statistically significant differences. Independent predictors for predicting ICU admission were analyzed using Logistic Regression analysis. The Hosmer-Lemeshow test was used for model fit. Values of $p < 0.05$ were considered statistically significant.

RESULTS

A total of 2955 cases were examined, including 671 (22.7%) patients who were VOC (+). The median ages of patients who were VOC (+) and VOC (–) were 36 (23–52) and 43 (29–59), respectively, wherein the difference was statistically significant ($p < 0.001$). In addition, 55.7% patients who were VOC (+) and 55.6% patients who were VOC (–) were female, and the difference was not statistically significant ($p = 0.935$) (Table 1).

Of the patients who were VOC (+) and VOC (–), 8.6% and 10.2% were hospitalized, respectively. There was no statistically significant difference between hospitalization status, according to the presence/absence of the variant ($p = 0.234$) (Table 2). Of the patients who were variant-positive and those who were not, 1.9% and 3.9% were admitted to the ICU, respectively. The rate of admission to the ICU

Table 1. Distribution of Some Descriptive Characteristics by Variant Status

| | VOC (+) (n = 671) | VOC (-) (n = 2284) | p |
|----------------------------|-------------------|--------------------|---------|
| Age (year), median (Q1-Q3) | 36 (23–52) | 43 (29–59) | <0.001* |
| Gender, n (%) | | | |
| Male | 297 (44.3) | 1015 (44.4) | 0.935 |
| Female | 374 (55.7) | 1269 (55.6) | |

n: Number of cases; %: Column percentage

Table 2. Distribution of Some Clinical Characteristics by Variant Status

| | VOC (+) (n = 671) | VOC (-) (n = 2284) | p |
|------------------------------|-------------------|--------------------|--------|
| Hospitalized patients, n (%) | 58 (8.6) | 233 (10.2) | 0.234 |
| Admission to the ICU, n (%) | 13 (1.9) | 90 (3.9) | 0.013* |

n: Number of cases; %: Column percentage

Table 3. Independent Effects of Age, Gender, and VOC Positivity In Predicting Admission to The ICU

| | p | OR | 95% CI |
|----------------|-----------|-------|-------------|
| Age | <0.001 | 1.082 | 1.067–1.097 |
| Gender | | | |
| Male | Reference | | |
| Female | 0.472 | 0.589 | 0.568–1.299 |
| VOC Positivity | | | |
| Negative | Reference | | |
| Positive | 0.363 | 0.754 | 0.410–1.386 |

OR: Odds ratio; CI: Confidence interval

was significantly higher for patients who were not positive for the variant as compared to those who were ($p = 0.013$) (Table 2).

Of the 2955 patients included, the median age of 103 patients admitted to the ICU was 71 (60–76), whereas the median age of 2852 patients who were not admitted to the ICU was 41 (27–57). The ages of patients who were admitted to the ICU was found to be significantly higher than the ages of those who were not ($p < 0.001$). In addition, of the patients who were admitted and not admitted to the ICU, 52.4% and 55.7% were female, respectively, wherein the rates were similar ($p = 0.509$).

Logistic regression analysis was used to evaluate the independent effects of some characteristics in predicting admission to the ICU. Accordingly, it was found that age had an independent effect ($p < 0.001$), whereas gender and VOC positivity did not ($p = 0.472$ and $p = 0.363$, respectively) (Table 3).

DISCUSSION

In this study, hospitalization status and admission to the ICU as well as demographic characteristics were analyzed in patients who were confirmed to

be VOC (+) and VOC (-), by laboratories in Konya province accredited by the Turkish Ministry of Health.

There was no difference between patients who were VOC (+) and VOC (-), in terms of hospitalization status. However, admission to the ICU was found to be more common among patients who were VOC (-) as compared to those who were VOC (+).

At the time of this research, the B.1.1.7 mutation was detected in 22.7% of the patients who tested positive for COVID-19 via PCR testing. This rate was found to be 26% in a study conducted by Yilmaz et al. in Istanbul (8). In another study conducted in the UK, the rate of VOC (+) cases was reported to be 93% between January 25 and 31 2021 (3). Within the same time period, the positivity rate of the B.1.1.7/SGTF variant reached 90% of all SARS-CoV-2 variants circulating in Madrid [4]. On the other hand, it was estimated that 13.3% of the confirmed COVID-19 cases in Portugal were caused by the VOC 202012/01 (B.1.1.7) in January 2021 (9). The B.1.1.7 variant became the dominant variant, approximately three months after it was first detected in the UK in September 2020. In Turkey, the B.1.1.7 variant, which was first reported in Istanbul, spread throughout the

country over time. The time when variant strains become dominant may vary by the date and region where they are reported. The B.1.1.7 variant became dominant in Turkey, approximately a month after this study was conducted.

In this study, of the patients who were VOC (+) and VOC (-), 8.6% and 10.2% were hospitalized, respectively, wherein the rates were similar. The hospitalization status of those who were positive for the variant and those who were not was also found to be similar to the results by Yilmaz et al. in İstanbul (8). Moreover, in another study conducted in the UK, Davies et al. found no clear evidence that VOC 202012/01 results in more or less severe disease as compared to the pre-existing variants (10). In Denmark, a study revealed that individuals infected with the B.1.1.7 strain had a 42% higher risk of hospitalization compared to individuals infected with other strains of SARS-CoV-2 (11). Nyberg et al. found that the risk of hospitalization within 14 days of a positive test was 1.52 times higher in patients diagnosed with COVID-19 and infected with the B.1.1.7 variant, in the UK (3). In another study conducted with PCR-positive cases in Norway between December 20, 2020 and May 2, 2021, it was shown that the B.1.1.7 variant led to a 1.6-fold increase in the risk of hospitalization (12). Different results were reported in terms of hospitalization status or risk of hospitalization associated with the B.1.1.7 variant in the studies listed. In the present study, there was no difference in terms of hospitalization status. This could be attributed to the fact that the patients were followed up for ten days, they were not evaluated in terms of comorbidities, and that the B.1.1.7 variant was not the dominant variant in Konya and Turkey at the time of this study.

In the present study, 1.9% and 3.9% of the patients who were positive for the variant and those who were not, respectively, were admitted to the ICU, the latter displaying a higher rate of admission to the ICU than the former. According to Yilmaz et al., there was no difference between patients who were VOC (+) and VOC (-), in terms of admission to the ICU (8). A study conducted in Spain has shown that patients infected with the B.1.1.7 variant had a two-fold higher risk of admission to the ICU than those not infected with the said variant (4). Stirrup et al. determined that the risk of admission to the ICU was not different between patients infected and not infected with the B.1.1.7 variant, whereas Whittaker et al. found no difference between patients infected with the B.1.1.7 variant and those who were VOC (-), in terms of the time

from symptom onset to hospitalization and length of hospital or ICU stay (13, 14). Funk et al. reported that a larger proportion of patients who were VOC (+) were admitted to the ICU compared to those who were not (15). According to a UK-based study, patients infected with B.1.1.7 had a significantly higher risk of admission to the ICU compared to those who were not infected with B.1.1.7 (6). A study from Norway showed that patients infected with B.1.1.7 had a higher risk of admission to the ICU than those who were not (12). In the present study, the age of patients who were not infected with the variant was significantly higher than the age of those who were. In addition, evaluation of the factors affecting admission to the ICU with multivariate analysis revealed that age was a factor affecting admission to the ICU. In various studies, age was reported to be one of the important factors that lead to an increased risk of admission to the ICU (4, 6, 12, 13, 15, 16). With respect to hospitalization status, there may be other factors involved such as the fact that patients were followed up for ten days and that they were not evaluated in terms of comorbidities.

Our study includes some limitations. Positive patients were followed up for ten days through the system. This time period could have been 28 days or longer, in order to obtain a better picture in terms of hospitalization and admission to intensive care. This study included patients who visited outpatient clinics and emergency departments of hospitals and tested positive in a PCR test. Our study may not entirely represent society, since there are other people who may not have undergone PCR testing, those who may be positive for COVID-19 but at home, or those who are moving within the society with or without symptoms. These can be considered the limitations of the present study.

CONCLUSION

In the light of the findings of this study, it is possible to state that SARS-CoV-2 VOC 202012/01(B.1.1.7) is not more dangerous in terms of hospitalization and admission to the ICU. Further clinical trials evaluating disease severity should be conducted. The B.1.1.7 variant is highly infectious, which may lead to a more rapid increase in the number of cases in Konya Province and in Turkey. This can further increase the pre-existing hospital burden. The number of wards and intensive care beds allocated to patients with COVID-19 should be reconsidered in the hospitals of Turkey. In addition, ongoing efforts toward vaccination should be accelerated, to minimize the effects of the

COVID-19 pandemic.

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