Prevalence of Delta and Omicron Covid Variants in Ukraine (2022) is Consistent with European Trend

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Introduction

The high rate of infection with COVID-19 in patients worldwide and Europe, and mutation of viruses have led to the emergence of variants of SARS-CoV-2. On November 26, 2021, the SARS-CoV-2 B.1.1.529, or Omicron variant, was recognized as a new Variant of Concern (VOC). We hypothesized that the emergence of SARS-CoV-2 variants in Ukraine followed the prevalence of Delta and Omicron in Europe.

To test this hypothesis, we performed a retrospective study to determine the prevalence of SARS-CoV-2 variants circulating among patients hospitalized at Lviv Regional Infectious Diseases Hospital (LRIDH) in 2022.

Methods

From January 2022 to October 2022, 994 LRIDH inpatients were PCR positive for COVID-19. From these positive samples, 225 were selected for further analysis by the randomization method.

Positive samples represented three stages

Stage 1
included the months of January and February
(75 samples)

Stage 2
included the months of July and August
(142 samples)

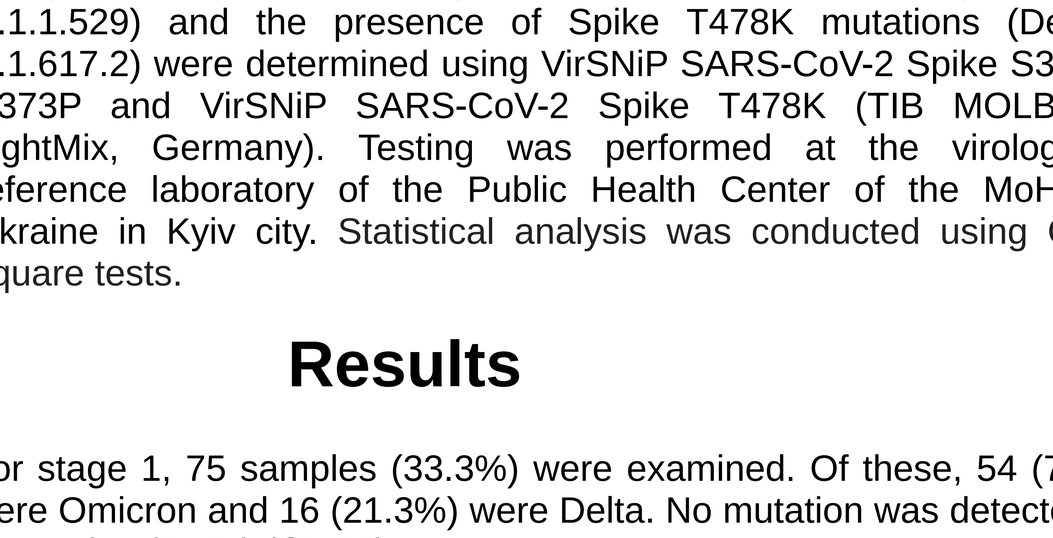
Stage 3
included the month of October
(8 samples)

The presence SARS-CoV-2 spike S371L/ S373P mutations (Omicron, B.1.1.529) and the presence of Spike T478K mutations (Delta, B.1.617.2) were determined using VirSNiP SARS-CoV-2 Spike S371L S373P and VirSNiP SARS-CoV-2 Spike T478K (TIB MOLBIOL LightMix, Germany). Testing was performed at the virological reference laboratory of the Public Health Center of the MoH of Ukraine in Kyiv city. Statistical analysis was conducted using Chi-square tests.

Results

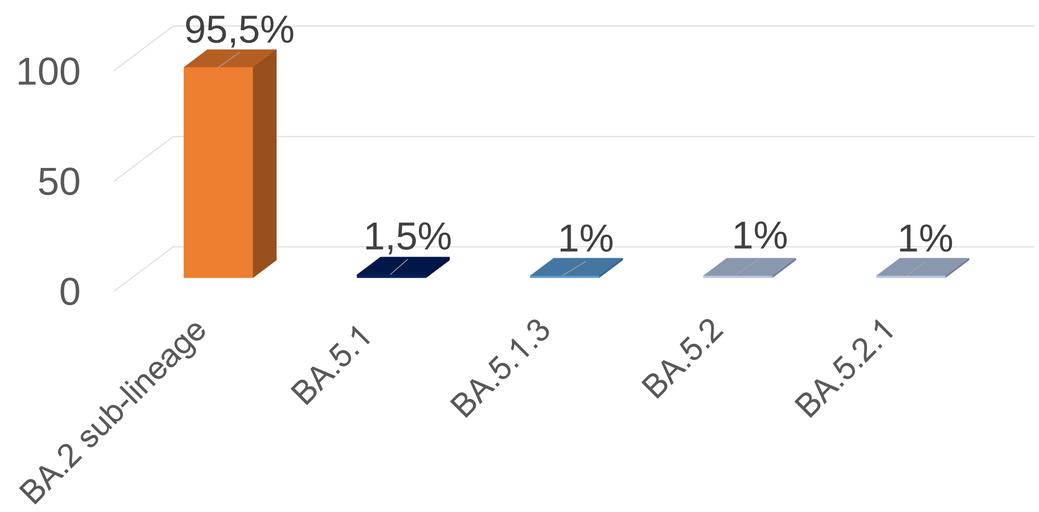
For stage 1, 75 samples (33.3%) were examined. Of these, 54 (72%) were Omicron and 16 (21.3%) were Delta. No mutation was detected in 5 samples (6.7%) (Ct>30).

The detection of mutations in January and February 2022 (stage 1)



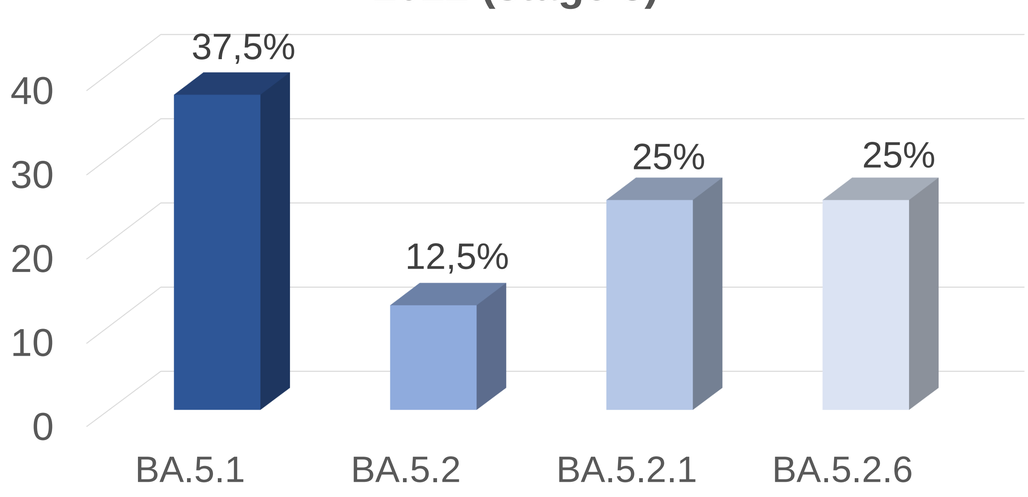
In stage 2, 142 samples (63.1%) were examined. Of these, 134 (94.4%) were Omicron, and for 8 (5.6%), no mutation was detected. Omicron BA.2 was identified in 128 (95.5%) of these samples.

The detection of mutations in July and August 2022 (stage 2)



In stage 3 (October 2022), 8 samples (3.6%) were examined. All were Omicron and BA.5.1 was found in 3 samples (37.5%), BA.5.2 - in 1 sample (12.5%), BA.5.2.1 - in 2 samples (25%), and BA.5.2.6 - in 2 samples (25%).

The detection of mutations in October 2022 (stage 3)



Conclusions

Studying the evolution and mutation of SARS-COV-2 can help with assessing vaccine effectiveness and provide insight on the prominence of higher or lower disease severity from different strains. The results are consistent with our hypothesis that in Ukraine, the prevalence of SARS-CoV-2 variants were consistent with Europe. The obtained results showed that the viruses circulating in Ukraine belong to the global genetic line B originating from China with a slight shift in time. In Ukraine, these tests can be performed routinely to assess the epidemiological situation and prevent the increase of the SARS-CoV-2 morbidity.

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