Neutralization profile of Omicron variant convalescent individuals

Janine Kimpel

14.02.2022
Aim

- Analyze neutralization profiles in sera from vaccinated and pre-omicron convalescent individuals against omicron variant
- Analyze neutralization profiles in sera from omicron convalescent patients

→ Cross-neutralization between pre-omicron variants and omicron
Virus isolates

- D614G: Isolate B86.2, GISAID ID EPI_ISL_3305837
- B.1.1.7 (Alpha): isolate C69.1, GISAID ID EPI_ISL_3277382
- B.1.351 (Beta): isolate C24.1, GISAID ID EPI_ISL_1123262
- P1.1 (Gamma): isolate hCoV-19/Germany/BY-MVP-000005870/2021, GISAID ID EPI_ISL_2095177
- B.1.617.2 (Delta): isolate SARS-CoV-2-hCoV-19/USA/NY-MSHSPSP-PV29995/2021, GISAID ID EPI_ISL_2290769
- BA.1 (Omicron): isolate E16.1, GISAID ID EPI_ISL_6902053
Focus forming assy with immunofluorescence staining

Authentic virus
1 h pre-incubation with plasma
Vero-TMPRSS2/ACE2 cells
10 h infection
Immunostaining (Alexa Fluor Plus 488)
Automatic counting

Virus only

Non-neutralizing serum

Neutralizing serum
Pre-omicron convalescent and vaccinated individuals

H) □ = mRNA-1273/mRNA-1273 vaccinated; ★ = ChAdOx1-S/ChAdOx1-S vaccinated; ○ = BNT162b2 vaccinated; ● = BNT162b2/BNT162b2 vaccinated
Pre-omicron breakthrough after vaccination

**Vacc.-Con.**

<table>
<thead>
<tr>
<th></th>
<th>BNT162b2/BNT162b2</th>
<th>ChAdOx1-S/ChAdOx1-S</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.1.617.2</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>BA.1</td>
<td><strong>★★★★</strong></td>
<td>*</td>
</tr>
</tbody>
</table>

● = BNT162b2/BNT162b2 vaccinated, n=24
★ = ChAdOx1-S/ChAdOx1-S vaccinated; n=6
Omicron convalescent individuals

□ = D614G convalescent; Δ = B.1.617.2 convalescent

https://www.medrxiv.org/content/10.1101/2022.02.01.22270263v1
Summary

• sera from pre-omicron convalecent patients neutralize BA.1 only weakly

• hybrid immune sera (BNT162b2 or ChAdOx1-S vaccination plus pre-omicron infection) were able to neutralize BA.1, although to a lesser degree than B.1.617.2

• high neutralizing antibody titers against all variants for vaccinated individuals after BA.1 breakthrough infection or for individuals after infection with a pre-omicron variant followed by BA.1 infection

• samples from naive unvaccinated individuals after BA.1 infection mainly contained neutralizing antibodies against BA.1 but only occasionally against the other variants

• BA.1 variant might represent a distinct new serotype
Acknowledgment

Medical University of Innsbruck
Institute of Virology
Dorothee von Laer
Annika Rössler
Albert Falch
Eva Hochmuth
Evelyn Peer
Lisa-Maria Raschbichler
Bianca Neurauter
Lydia Riepler
David Bante
Lukas Perro
Stephan Amstler
Andreas Aufschnaiter
Luiza Hoch
Helena Schäfer

Icahn School of Medicine at Mount Sinai
Florian Krammer
Viviana Simon

Ludwig Maximilians University Munich
Oliver T. Keppler
Marcel Stern

Tyrolpath Obrist Brunhuber GmbH
Ludwig Knabl