

THE BEST OF THE WEEK (13 mar – 19 mar 2023)

Carol Ho-Yan Fong et al

Effect of vaccine booster, vaccine type, and hybrid immunity on humoral and cellular immunity against SARS-CoV-2 ancestral strain and Omicron variant sublineages BA.2 and BA.5 among older adults with comorbidities: a cross sectional study

eBioMedicine, January 2023; doi.org/10.1016/j.ebiom.2023.104446

Abstract

Background

Vaccination reduces COVID-19-related hospitalization among older adults. However, how SARS-CoV-2 infection and vaccine regimens affect vaccine-elicited immunity remain unclear.

Methods

This is a cross-sectional study recruiting adults aged ≥ 70 years with comorbidities in Hong Kong. Demographic and clinical information were collected using a questionnaire. Neutralizing antibody (nAb) titers (against ancestral and Omicron strains) and SARS-CoV-2-specific T cell response were analyzed according to infection and vaccination status. Multivariable regression analysis was performed to assess the associations of BNT162b2 and booster doses with higher nAb titers, with adjustment for comorbidities.

Interpretation

Our data support the use of booster doses for older adults with or without prior infection. Non-infected individuals primed with CoronaVac will benefit from heterologous mRNA vaccine booster.

Richard M Carpiano et al.

Confronting the evolution and expansion of anti-vaccine activism in the USA in the COVID-19 era

The Lancet, march 2023; doi.org/10.1016/S0140-6736(23)00136-8

Abstract

Over the past two decades, anti-vaccine activism in the USA has evolved from a fringe subculture into an increasingly well organised, networked movement with important repercussions for public health. The COVID-19 pandemic has exacerbated this evolution and magnified the reach of vaccine misinformation. Anti-vaccine activists, who for many years spoke primarily to niche communities hesitant about childhood vaccinations, have used traditional and social media to amplify vaccine-related mistruths about COVID-19 vaccines while also targeting historically marginalised racial and ethnic communities. These efforts contributed to COVID-19 vaccine hesitancy and expanded the movement, with early indications suggesting that this hesitancy could now also be increasing hesitancy that existed pre-pandemic towards other vaccines. It is important to understand the implications of this recent evolution of anti-vaccine activism on vaccination uptake and the promotion of sound public health

strategies. In this Viewpoint, we summarise the latest developments in US-based anti-vaccine activism and propose strategies for confronting them.

Yang Wang et al.

SARS-CoV-2 Exposure in Norway Rats (*Rattus norvegicus*) from New York City

https://journals.asm.org/doi/10.1128/mbio.03621-22?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%20pubmed

Abstract

Millions of Norway rats (*Rattus norvegicus*) inhabit New York City (NYC), presenting the potential for transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from humans to rats. We evaluated SARS-CoV-2 exposure among 79 rats captured from NYC during the fall of 2021. Our results showed that 13 of the 79 rats (16.5%) tested IgG- or IgM-positive, and partial SARS-CoV-2 genomes were recovered from all 4 rats that were qRT-PCR (reverse transcription-quantitative PCR)-positive. Genomic analyses suggest these viruses were associated with genetic lineage B, which was predominant in NYC in the spring of 2020 during the early pandemic period. To further investigate rat susceptibility to SARS-CoV-2 variants, we conducted a virus challenge study and showed that Alpha, Delta, and Omicron variants can cause infections in wild-type Sprague Dawley (SD) rats, including high replication levels in the upper and lower respiratory tracts and induction of both innate and adaptive immune responses. Additionally, the Delta variant resulted in the highest infectivity. In summary, our results indicate that rats are susceptible to infection with Alpha, Delta, and Omicron variants, and wild Norway rats in the NYC municipal sewer systems have been exposed to SARS-CoV-2. Our findings highlight the need for further monitoring of SARS-CoV-2 in urban rat populations and for evaluating the potential risk of secondary zoonotic transmission from these rat populations back to humans.

IMPORTANCE The host tropism expansion of SARS-CoV-2 raises concern for the potential risk of reverse-zoonotic transmission of emerging variants into rodent species, including wild rat species. In this study, we present both genetic and serological evidence for SARS-CoV-2 exposure to the New York City wild rat population, and these viruses may be linked to the viruses that were circulating during the early stages of the pandemic. We also demonstrated that rats are susceptible to additional variants (i.e., Alpha, Delta, and Omicron) that have been predominant in humans and that susceptibility to infection varies by variant. Our findings highlight the reverse zoonosis of SARS-CoV-2 to urban rats and the need for further monitoring of SARS-CoV-2 in rat populations for potential secondary zoonotic transmission to humans.