Providence

COVID-19 Resource Desk

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Prepared by System Library Services Retraction Watch

New Research

*note, **PREPRINTS** have not undergone formal peer review

COVID-19 related publications by Providence caregivers – see Digital Commons

Clinical Syndrome

1. **Attributable Mortality of Ventilator-associated Pneumonia Among COVID-19 Patients.** Vacheron CH et al. Am J Respir Crit Care Med. 2022 May 10. doi: 10.1164/rccm.202202-0357OC. Online ahead of print. https://www.atsjournals.org/doi/10.1164/rccm.202202-0357OC

RESULTS: A total of 64,816 patients were included in the control group, 7,442 in the PandeCOV-, and 1,687 in the PandeCOV+. The incidence of VAP was 14.2 (95%CI[13.9;14.6]), 18.3 (95%CI[17.3;19.4]), and 31.9 (95%CI[29.8;34.2]) VAP per 1000 ventilation-day, in each group, respectively. Attributable Mortality at 90 days was 3.15%(95%CI[2.04;3.43]), 2.91%(95%CI[-0.21;5.02]), and 8.13%(95%CI[3.54-12.24]), and attributable fraction of mortality at 90 days was 1.22% (95%CI[0.83;1.63]), 1.42% (95%CI[-0.11-2.61]), and 9.17% (95%CI[3.54;12.24]) for the control, PandeCOV-, and PandeCOV+.groups, respectively. Except for the higher risk of developing a VAP, the PandeCOV- group shared similar VAP characteristics with the control group. PandeCOV+ patients were at lower risk of death without VAP (HR 0.62, 95%CI [0.52;0.74]) compared to the control group.
CONCLUSION: VAP attributable mortality was higher for COVID-19 patients, with more than 9% of the overall mortality related to VAP.

2. **Neuropsychiatric Ramifications of Severe COVID-19 and Other Severe Acute Respiratory Infections.** Clift AK, Ranger TA, Patone M, Coupland CAC, Hatch R, Thomas K, Hippisley-Cox J, Watkinson P. JAMA Psychiatry. 2022 May 11. doi: 10.1001/jamapsychiatry.2022.1067. Online ahead of print. https://jamanetwork.com/journals/jamapsychiatry/fullarticle/2792404

RESULTS: In this cohort study of data from 8.38 million adults (4.18 million women, 4.20 million men; mean [SD] age 49.18 [18.45] years); 16 679 (0.02%) survived a hospital admission for SARI, and 32 525 (0.03%) survived a hospital admission for COVID-19. Compared with the remaining population, survivors of SARI and COVID-19 hospitalization had higher risks of subsequent neuropsychiatric diagnoses. For example, the HR for anxiety in survivors of SARI was 1.86 (95% CI, 1.56-2.21) and for survivors of COVID-19 infection was 2.36 (95% CI, 2.03-2.74); the HR for dementia for survivors of SARI was 2.55 (95% CI, 2.17-3.00) and for survivors of COVID-19 infection was 2.63 (95% CI, 2.21-3.14). Similar findings were observed for all medications analyzed; for example, the HR for first prescriptions of antidepressants in survivors of SARI was 2.55 (95% CI, 2.24-2.90) and for survivors of COVID-19

infection was 3.24 (95% CI, 2.91-3.61). There were no significant differences observed when directly comparing the COVID-19 group with the SARI group apart from a lower risk of antipsychotic prescriptions in the former (HR, 0.80; 95% CI, 0.69-0.92).
CONCLUSIONS AND RELEVANCE: In this cohort study, the neuropsychiatric sequelae of severe COVID-19 infection were found to be similar to those for other SARI. This finding may inform postdischarge support for people surviving SARI.

Diagnostics & Screening

3. **Clinical Validation of a Novel T-cell Receptor Sequencing Assay for Identification of Recent or Prior SARS-CoV-2 Infection.** Dalai SC et al. Clin Infect Dis. 2022 May 6:ciac353. doi: 10.1093/cid/ciac353. Online ahead of print. https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciac353/6581622

CONCLUSION: T-Detect COVID is a novel T-cell immunosequencing assay demonstrating high clinical performance for identification of recent or prior SARS-CoV-2 infection from blood samples, with implications for clinical management, risk stratification, surveillance, and understanding protective immunity and long-term sequelae.

Epidemiology & Public Health

4. **Evidence of transmission and circulation of Deltacron XD recombinant SARS-CoV-2 in Northwest France.** Moisan A, Mastrovito B, De Oliveira F, Martel M, Hedin H, Leoz M, Nesi N, Schaeffer J, Ar Gouilh M, Plantier JC. Clin Infect Dis. 2022 May 10:ciac360. doi: 10.1093/cid/ciac360. Online ahead of print. https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciac360/6583149

On February 2022, samples collected in Northwest France showed discordant molecular results. After virological and epidemiological investigations, 17 cases of Deltacron XD recombinant SARS-CoV-2 were confirmed by sequencing or suspected due to epidemiological links, showing evidence of an extended transmission event and circulation of this form, with low clinical severity.

Therapeutics

5. **Energy expenditure in Covid 19 mechanical ventilated patients: A comparison of three methods of energy estimation.** Saseedharan S, Chada RR, Kadam V, Chiluka A, Nagalla B. JPEN J Parenter Enteral Nutr. 2022 May 8. doi: 10.1002/jpen.2393. Online ahead of print. https://aspenjournals.onlinelibrary.wiley.com/doi/10.1002/jpen.2393

CLINICAL RELEVANCY STATEMENT: Both overfeeding and underfeeding of intensive care unit (ICU) patients are associated with worse outcomes. Ideally, the individual caloric target is based on the frequent assessment of energy expenditure (EE). Indirect calorimetry is considered the gold standard but is not always available. EE estimated by ventilator-derived carbon dioxide consumption (EEVCO2) derived from ventilator and stand-alone monitors has also been proposed as an alternative. Guidelines recommend predictive weight-based dosing when indirect calorimetry (IC) is not feasible to estimate daily energy requirements. This study was able to prove that guideline-recommended weight-based

calculations overestimated the energy requirements and we were able to arrive at an energy estimation that can be closer to the EE with IC and EEVCO2 among COVID-19 patients. This study would help in standardizing the more commonly used weight-based calculations for energy estimation.

6. **An open-label randomized, controlled trial of the effect of lopinavir/ritonavir, lopinavir/ritonavir plus IFN-β-1a and hydroxychloroquine in hospitalized patients with COVID-19 - Final results.** Ader F; DisCoVeRy Study Group. Clin Microbiol Infect. 2022 May 7:S1198-743X(22)00224-5. doi: 10.1016/j.cmi.2022.04.016. Online ahead of print. https://www.sciencedirect.com/science/article/pii/S1198743X22002245

We published in the December 2021 issue of Clinical Microbiology and Infection the preliminary results of the DisCoVeRy trial regarding the efficacy of lopinavir/ritonavir, lopinavir/ritonavir plus IFN-β-1a and hydroxychloroquine in hospitalized patients with COVID-19 [1]. These three experimental repurposed treatments did not show clinical or virological benefit in the studied population. Of note, the number of patients included was low as inclusion in those arms of the trial was prematurely stopped by the DSMB. Here, after completion of data monitoring, we report the final analysis, including two secondary endpoints which were not previously reported (Table 1).

7. **Agreement of treatment effects from observational studies and randomized controlled trials evaluating hydroxychloroquine, lopinavir-ritonavir, or dexamethasone for covid-19: meta-epidemiological study.** Moneer O, Daly G, Skydel JJ, Nyhan K, Lurie P, Ross JS, Wallach JD. BMJ. 2022 May 10;377:e069400. doi: 10.1136/bmj-2021-069400. https://www.bmj.com/content/377/bmj-2021-069400

CONCLUSIONS: Meta-analyses of observational studies and RCTs evaluating treatments for covid-19 have summary treatment effects that are generally in agreement. Although our evaluation is limited to three covid-19 treatments, these findings suggest that meta-analyzed evidence from observational studies might complement, but should not replace, evidence collected from RCTs.

Vaccines / Immunology

8. **Omicron infection enhances Delta antibody immunity in vaccinated persons.** Khan K et al. Nature. 2022 May 6. doi: 10.1038/s41586-022-04830-x. Online ahead of print. https://www.nature.com/articles/s41586-022-04830-x

The extent to which Omicron infection1-9, with or without previous vaccination, elicits protection against the previously dominant Delta (B.1.617.2) variant is unclear. We measured SARS-CoV-2 variant neutralization capacity in 39 Omicron sub-lineage BA.1 infected individuals in South Africa starting at a median of 6 (IQR 3-9) days post-symptoms onset and continuing until a last follow-up sample a median of 23 (IQR 19-27) days post-symptoms to allow BA.1 elicited neutralizing immunity time to develop. Fifteen participants were vaccinated with Pfizer-BNT162b2 or J&J-Ad26.CoV2.S and had BA.1 breakthrough infections, and 24 were unvaccinated. BA.1 neutralization increased from a geometric mean titer (GMT) FRNT50 of 42 at enrollment to 575 at the last follow-up time-point (13.6-fold) in vaccinated and from 46 to 272 (6.0-fold) in unvaccinated participants. Delta virus neutralization also increased, from 192 to 1091 (5.7-fold) in vaccinated and 28 to 91 (3.0-fold) in unvaccinated participants. At the last time-point, unvaccinated BA.1 infected individuals had 2.2-fold lower BA.1

neutralization, 12.0-fold lower Delta neutralization, 9.6-fold lower Beta variant neutralization, 17.9-fold lower ancestral virus neutralization, and 4.8-fold lower Omicron sub-lineage BA.2 neutralization relative to vaccinated, with low absolute levels of neutralization for the non-BA.1 viruses. These results indicate that vaccination combined with Omicron/BA.1 infection hybrid immunity should be protective against Delta and other variants. In contrast, infection with Omicron/BA.1 alone offers limited cross-protection despite moderate enhancement.

9. **Antibody duration after infection from SARS-CoV-2 in the Texas Coronavirus Antibody Response Survey.** Swartz MD et al. J Infect Dis. 2022 May 6:jiac167. doi: 10.1093/infdis/jiac167. Online ahead of print. https://academic.oup.com/jid/advance-article/doi/10.1093/infdis/jiac167/6581498

Understanding the duration of antibodies to the SARS-CoV-2 virus that causes COVID-19 is important to controlling the current pandemic. Participants from the Texas Coronavirus Antibody REsponse Survey (Texas CARES) with at least one nucleocapsid protein antibody test were selected for a longitudinal analysis of antibody duration. A linear mixed model was fit to data from participants (n= 4,553) with one to three antibody tests over 11 months (10/1/2020-9/16/2021), and models fit showed that expected antibody response after COVID-19 infection robustly increases for 100 days post-infection, and predicts individuals may remain antibody positive from natural infection beyond 500 days, depending on age, body mass index, smoking or vaping use, and disease severity (hospitalized or not; symptomatic or not).

10. **Humoral Immunogenicity of the mRNA-1273 Vaccine in the Phase 3 COVE Trial.** El Sahly HM et al. J Infect Dis. 2022 May 10:jiac188. doi: 10.1093/infdis/jiac188. Online ahead of print. https://academic.oup.com/jid/advance-article/doi/10.1093/infdis/jiac188/6583011

CONCLUSION: mRNA-1273 elicited robust serologic immune responses across age, sex, and SARS-CoV-2-status, consistent with its high COVID-19 efficacy. Higher immune responses in those previously-infected support a booster-type effect.ClinicalTrials.gov: NCT04470427.

11. **Evaluation of mRNA-1273 Covid-19 Vaccine in Children 6 to 11 Years of Age.** Creech CB et al. N Engl J Med. 2022 May 11. doi: 10.1056/NEJMoa2203315. Online ahead of print. https://www.nejm.org/doi/10.1056/NEJMoa2203315

CONCLUSIONS: Two 50-µg doses of the mRNA-1273 vaccine were found to be safe and effective in inducing immune responses and preventing Covid-19 in children 6 to 11 years of age; these responses were noninferior to those in young adults.
(Funded by the Biomedical Advanced Research and Development Authority and the National Institute of Allergy and Infectious Diseases; KidCOVE ClinicalTrials.gov number, NCT04796896.).

12. **Antibody response of heterologous vs homologous mRNA vaccine boosters against the SARS-CoV-2 Omicron variant: interim results from the PRIBIVAC study, A Randomized Clinical Trial.** Poh XY et al. Clin Infect Dis. 2022 May 11:ciac345. doi: 10.1093/cid/ciac345. Online ahead of print. https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciac345/6583615

RESULTS: 51 participants were allocated to BBB and 49 to BBM; 50 and 48 respectively were analyzed for safety and immunogenicity outcomes. At Day 28 post-boost, mean SARS-CoV-2 spike antibody titers were lower with BBB (22,382 IU/mL 95% CI, 18,210 to 27,517) vs BBM (29,751 IU/mL 95% CI, 25,281

to 35,011, p = 0.034) as was the median level of neutralizing antibodies: BBB 99.0% (IQR 97.9 to 99.3%) vs BBM 99.3% (IQR 98.8 to 99.5%, p = 0.021). On sub-group analysis, significant differences in mean spike antibody titer and live Omicron neutralization titer was only observed in older adults. Median surrogate neutralizing antibody level against all VOCs was also significantly higher with BBM in older adults, and against Omicron was BBB 72.8% (IQR 54.0 to 84.7%) vs BBM 84.3% (IQR 78.1 to 88.7%, p = 0.0073). Both vaccines were well tolerated.
CONCLUSIONS: Heterologous mRNA-1273 booster vaccination induced a stronger neutralizing response against the Omicron variant in older individuals compared with homologous BNT123b2.

13. **Older adults mount less durable humoral responses to two doses of COVID-19 mRNA vaccine, but strong initial responses to a third dose.** Mwimanzi F et al. J Infect Dis. 2022 May 11:jiac199. doi: 10.1093/infdis/jiac199. Online ahead of print. https://academic.oup.com/jid/advance-article/doi/10.1093/infdis/jiac199/6583561

RESULTS: Following two vaccine doses, humoral immunity was weaker, less functional and less durable in older adults, where a higher number of chronic health conditions was a key correlate of weaker responses and poorer durability. One month after the third dose, antibody concentrations and function exceeded post-second-dose levels, and responses in older adults were comparable in magnitude to those in younger adults at this time. Humoral responses against Omicron were universally weaker than against the ancestral strain after both the second and third doses. Nevertheless, after three doses, anti-Omicron responses in older adults reached equivalence to those in younger adults. One month after three vaccine doses, the number of chronic health conditions, but not age, was the strongest consistent correlate of weaker humoral responses.
CONCLUSION: Results underscore the immune benefits of third COVID-19 vaccine doses, particularly in older adults.

Women & Children

14. **Evaluation of mRNA-1273 Covid-19 Vaccine in Children 6 to 11 Years of Age.** Creech CB et al. N Engl J Med. 2022 May 11. doi: 10.1056/NEJMoa2203315. Online ahead of print. https://www.nejm.org/doi/10.1056/NEJMoa2203315

CONCLUSIONS: Two 50-µg doses of the mRNA-1273 vaccine were found to be safe and effective in inducing immune responses and preventing Covid-19 in children 6 to 11 years of age; these responses were noninferior to those in young adults.
(Funded by the Biomedical Advanced Research and Development Authority and the National Institute of Allergy and Infectious Diseases; KidCOVE ClinicalTrials.gov number, NCT04796896.).

GUIDELINES & CONSENSUS STATEMENTS

FDA / CDC / NIH / WHO Updates

Commentary

Mohamed A. **Bias Against the Willfully Unvaccinated** [published online ahead of print, 2022 May 10]. *Ann Intern Med*. 2022;10.7326/M22-0476. doi:10.7326/M22-0476
https://www.acpjournals.org/doi/full/10.7326/M22-0476?af=R

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