COVID-19 and Immunity Issues: Upcoming Treatment Options

COVID-19 Webinar Series

The mission of ALLERGY & ASTHMA NETWORK

Is to end the needless death and suffering due to asthma, allergies and related conditions through outreach, education, advocacy and research.
MEET OUR Speakers

Dr. S. Shahzad Mustafa
Chief – Allergy, Immunology & Rheumatology
Rochester Regional Health
Clinical Associate Professor of Medicine
University of Rochester School of Medicine & Dentistry

Tonya Winders
President & CEO, Allergy & Asthma Network
President, Global Allergy & Airways Patient Platform

Today’s Program

01 CURRENT STATE OF COVID-19

02 IMMUNITY ISSUES

03 MANAGEMENT OPTIONS FOR COVID-19
We’d like to know who is with us today!

What category best describes you? (we have a limited number of answers or would offer more!)
Case rates of Covid-19 have been on the rise as the Omicron variant has spread, but hospitalization numbers appear to be staying relatively low. For vaccinated people, evidence suggests that infection with this variant seems less likely to be severe, epidemiologist and former Detroit Health Department executive director, Dr. Abdul El-Sayed said.

The US Food and Drug Administration authorized Pfizer’s Covid-19 vaccine for booster shots in 12- to 15-year-olds. Boosters are now available for everyone 12 and older in the United States.

Changes in CDC recommendations:

- People with COVID-19 should isolate for 5 days if asymptomatic or symptoms are resolving
- Follow with 5 days of wearing a mask around others

Change motivated by science demonstrating that the majority of SARS-CoV-2 transmission occurs early in the course of illness, generally in the 1-2 days prior to onset of symptoms and the 2-3 days after.

If You Were Exposed to Someone with COVID-19 (Quarantine)

If you:

Have been boosted
OR
Completed the primary series of Pfizer or Moderna vaccine within the last 6 months
OR
Completed the primary series of J&J vaccine within the last 2 months

- Wear a mask around others for 10 days.
- Test on day 5, if possible.

If you develop symptoms get a test and stay home.

If you:

Completed the primary series of Pfizer or Moderna vaccine over 6 months ago and are not boosted
OR
Completed the primary series of J&J over 2 months ago and are not boosted
OR
Are unvaccinated

- Stay home for 5 days. After that continue to wear a mask around others for 5 additional days.
- If you can’t quarantine you must wear a mask for 10 days.
- Test on day 5 if possible.

If you develop symptoms get a test and stay home.
IN THE NEWS

US surpassed its record for COVID-19 hospitalizations last Tuesday – with no end in sight for sky-rocketing case loads. 145,982 patients in US hospitals for COVID-19

Under the new policy announced by the White House, individuals covered by a health insurance plan who purchase an over-the-counter COVID-19 diagnostic test that has been authorized, cleared or approved by the Food and Drug Administration will be able to have those test costs covered by their insurance.

CDC Data

COVID-19 Cases by Date Reported

New Cases by Day

[Graph showing COVID-19 cases by date reported]
Risk for Severe Disease Among Hospitalized Adults with Asthma or COPD

- ICU Admissions: 46.9%
  - Patients with asthma & COVID-19
- Invasive Mechanical Ventilation: 14%
  - Patients with asthma & COVID-19
- Death: 8%
  - Patients with asthma & COVID-19
- ICU Admission: 1.17%
  - Patients with asthma but not COVID-19
- Invasive Mechanical Ventilation: 1.61%
  - Patients with asthma but not COVID-19
- Death: 5.56%
  - Patients with asthma but not COVID-19

Hospitalizations among patients with asthma and/or COPD with COVID-19 had a more severe clinical course than hospitalizations for asthma and/or COPD exacerbations without COVID-19.

Poll Question

Have you witnessed the COVID-19 surge in your community?
IMMUNITY ISSUES

Dr. Mustafa

Immune Components

- Complement proteins
- Neutrophils & phagocytes
- T cells
- Antibodies

Immune System
Causes of Immunodeficiency

- Primary immunodeficiency
- Kidney disease
- GI malabsorption
- Blood cancers
  - Multiple myeloma
  - Non-Hodgkin’s lymphoma
  - Chronic lymphocytic leukemia
- Malnutrition
  - Medications
    - Systemic steroids
    - Anticonvulsants
    - Rituximab
    - Ibrutinib

<table>
<thead>
<tr>
<th>Summary of Findings*</th>
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<tbody>
<tr>
<td>Category</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Total No. of patients</td>
</tr>
<tr>
<td>% of patients with CI infection</td>
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<tr>
<td>Period in years under observation (average ± SD)</td>
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<tr>
<td>Average annual infection rate</td>
</tr>
<tr>
<td>Total No. of infections</td>
</tr>
<tr>
<td>% of infections while receiving therapy</td>
</tr>
<tr>
<td>Total mortality % of deaths primarily due to infections</td>
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<tr>
<td>Site of infection</td>
</tr>
<tr>
<td>Pneumococcus</td>
</tr>
<tr>
<td>Klebsiella</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
</tr>
<tr>
<td>Pseudomonas</td>
</tr>
<tr>
<td>Proteus mirabilis</td>
</tr>
<tr>
<td>Haemophilus influenzae</td>
</tr>
<tr>
<td>Enterococcus faecalis</td>
</tr>
<tr>
<td>Streptococcus</td>
</tr>
<tr>
<td>Staphylococcus</td>
</tr>
<tr>
<td>Mycobacterium tuberculosis</td>
</tr>
<tr>
<td>Herpes simplex</td>
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<tr>
<td>Monilia albicans</td>
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Risk of Infection due to B Cell Malignancy

- Infected Patients/Year
- Patients/Group
  - 11, 15, 17
  - 15, 12, 15
  - 18, 19, 17
  - 50-59
  - < 50
  - > 70

1/20/22
Risk of Infection due to Medications

Current State
Vaccination in Immunodeficiency

Vaccines lead to antibody production

B cells make antibodies

B cells are abnormal in blood cancers

B cells are further depleted by certain medications

Patients with blood cancers have suboptimal antibody responses

COVID-19 Vaccine in Blood Cancers
COVID-19 Vaccine in Blood Cancers

COVID-19 Vaccine s/p Rituximab

- Roughly 1/3 of rheumatology patient demonstrated detectable antibodies

COVID-19 in Inflammatory Conditions

COVID-19 mRNA Vaccine 3rd Dose

Three doses of an mRNA COVID-19 vaccine in solid-organ transplant recipients

- No serious adverse events were reported after administration of the 3rd dose, and no acute rejection episodes occurred (n=99)
COVID-19 mRNA Vaccine in 3\textsuperscript{rd} Dose in CLL

41/172 (23.8\%) of patients with no detectable antibodies s/p 2\textsuperscript{nd} doses demonstrated antibodies s/p 3\textsuperscript{rd} dose

Table 3. Multivariate analysis for serologic response in CLL patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds ratio</th>
<th>95% CI</th>
<th>p-value</th>
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<tbody>
<tr>
<td>Age ≤65y</td>
<td>2.5</td>
<td>0.9-6.6</td>
<td>0.067</td>
</tr>
<tr>
<td>Lack of active therapy</td>
<td>5.6</td>
<td>2.3-13.8</td>
<td>&lt;0.001</td>
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<tr>
<td>Serum IgG level ≥550, mg/dL</td>
<td>1.0</td>
<td>0.3-3.2</td>
<td>0.974</td>
</tr>
<tr>
<td>Serum IgA level ≥80, mg/dL</td>
<td>5.8</td>
<td>2.1-15.9</td>
<td>&lt;0.001</td>
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MANAGEMENT OPTIONS FOR COVID-19

Dr. Mustafa
COVID-19 Prophylaxis – Ig Replacement

COVID-19 vaccines rapidly increased the percentage of Americans with antibodies

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<thead>
<tr>
<th></th>
<th>JANUARY 21</th>
<th></th>
<th>MAY 21</th>
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<tbody>
<tr>
<td>No Antibodies</td>
<td>79.5%</td>
<td>no antibodies</td>
<td>16.7%</td>
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<tr>
<td>Antibodies from Vaccination</td>
<td>15.9%</td>
<td>63.1%</td>
<td></td>
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<tr>
<td>Antibodies from Infection*</td>
<td>4.6%</td>
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* Includes unknown percentage of vaccinated people

Get vaccinated to protect yourself from severe disease caused by COVID-19

[cdc.gov/coronavirus]

COVID-19 Prophylaxis

AZD7442 PROVENT Phase III prophylaxis trial met primary endpoint in preventing COVID-19

Published 20 August 2021

20 August 2021 07:00 BST

77% reduced risk of developing symptomatic COVID-19

First long-acting antibody combination to prevent COVID-19
COVID-19 Treatment – Monoclonal Antibodies

- Sotrovimab (GSK), Casirivimab w/ imdevimab (Regeneron), Bamlanivimab + etesevimab (Eli Lilly)

COVID-19 Treatment Outcomes with MABs

- Quicker decrease in viral load
- Decreased rate of hospitalization
- Quicker resolution of symptoms
- No increased risk of side effects as compared to placebo
COVID-19 Treatment – Oral Antivirals

Paxloid (nirmetreliver + ritonavir)
- Consider drug-drug interactions

Molunpiravir
- Contraindicated in pregnancy or in individuals who may become pregnant

COVID-19 Treatment – Oral Antiviral Therapy

Pfizer’s Novel COVID-19 Oral Antiviral Treatment Candidate
Reduced Risk of Hospitalization or Death by 89% in Interim Analysis of Phase 2/3 EPIC-HR Study

Friday, November 05, 2021 - 06:45am

- PAXLOVID™ (PF-07321332; ritonavir) was found to reduce the risk of hospitalization or death by 89% compared to placebo in non-hospitalized high-risk adults with COVID-19
- In the overall study population through Day 28, no deaths were reported in patients who received PAXLOVID™ as compared to 10 deaths in patients who received placebo
- Pfizer plans to submit the data as part of its ongoing rolling submission to the U.S. FDA for Emergency Use Authorization (EUA) as soon as possible
Summary

Roughly 3% of US population has significant immunodeficiency

COVID-19 pandemic poses increased risk to individuals with immunodeficiency

Vaccines are recommended by response is often suboptimal

Individuals with immunodeficiency warrant consideration of additional therapeutic options for prevention & treatment of COVID-19

QUESTIONS

Record your questions in the question box
We’ll get to as many as we can!
Next Webinar

Join us for our upcoming webinar

Asthma Monitoring Options for the Digital Age: Improving Outcomes

Thursday, January 27, 2022
7:00 PM ET

Breathe Better Together

Allergy & Asthma Network

allergyasthamanetwork.org

Please remain online for 2 – 3 minutes to complete an evaluation survey! Thank you!