Is COVID-19 PrEP on the Horizon?

Post-exposure and pre-exposure prophylaxis could be a game-changer for immunocompromised people.

November 5, 2021 By Liz Highleyman

UPDATE: On December 8, the Food and Drug Administration granted emergency use authorization for AstraZeneca's monoclonal antibody combination Evusheld (tixagevimab plus cilgavimab) for COVID-19 pre-exposure prophylaxis.

Pre-exposure prophylaxis (PrEP) using daily pills has transformed HIV prevention—and monthly PrEP injections could be approved early next year. Likewise, monoclonal antibodies and oral antivirals taken before or after exposure to SARS-CoV-2, the coronavirus that causes COVID-19, could potentially play a similar—albeit more limited—role for people at risk for severe outcomes.

As the recent death of Colin Powell demonstrates, some people who are fully vaccinated against COVID-19 remain prone to severe illness and death. People with compromised immune systems, for example, may not respond to the vaccines. This is the case for some organ transplant recipients who take immunosuppressive drugs and people receiving cancer treatment or other medications that impair the activity of antibody-producing B cells. Although the Food and Drug Administration (FDA) has authorized Pfizer-BioNTech and Moderna vaccine boosters for immunocompromised people, some still are not adequately protected even after a third dose.

But, as Benjamin Ryan recently reported in the Guardian, monoclonal antibodies—and ultimately oral antivirals—could soon provide a lifeline for such individuals.

Monoclonal antibodies are already authorized for the treatment of people with mild or moderate COVID-19 who are at risk of progression to severe disease. Studies have shown that antibody therapies from Eli Lilly (bamlanivimab plus etesevimab) and Regeneron (casirivimab plus imdevimab) reduce the chances of hospitalization when administered during the early stages of COVID-19. Astra Zeneca has requested FDA authorization of another antibody cocktail, AZD7442 (tixagevimab plus cilgavimab), that has a longer duration of activity.

The FDA recently granted further authorization to both the Regeneron and Lilly antibody combos for use as post-exposure prophylaxis, or PEP, to prevent symptomatic COVID-19 in high-risk people who have recently been in close contact with someone known to have SARS-CoV-2.

This raises the prospect that monoclonal antibodies could be used even earlier as periodic pre-

exposure prophylaxis for high-risk individuals. Unvaccinated and immunocompromised people are already allowed to do so under the FDA's PEP authorization if they are at high risk for exposure because they live in an institutional setting (such as a nursing home or prison) where other people have SARS-CoV-2. Regeneron is in talks with the FDA about expanding its emergency use authorization to include PrEP, probably administered once monthly, according to the Guardian.

AstraZeneca has also requested emergency use authorization of AZD7442 for PrEP, after results from the Phase III PROVENT trial (presented as a late-breaker at the recent IDWeek 2021 meeting) showed that a single injection of the long-acting antibody combination reduced the risk of symptomatic COVID-19 by 77%. The study included more than 5,000 people in the U.S., U.K., and Europe who were unable to tolerate vaccines, at risk for poor vaccine response or at high risk for exposure to SARS-CoV-2. More than 40% were ages 60, and older and three quarters had comorbidities, including immunosuppressive conditions or use of immunosuppressive medications, diabetes, obesity or chronic heart, kidney, liver or lung disease.

"Ultimately, there will be a large group of immunocompromised people who will not mount a protective response with vaccines," Dorry Segev, MD, PhD, of the Johns Hopkins University Epidemiology Research Group in Organ Transplantation, told the Guardian. "For them, monoclonal antibodies as PrEP will likely be their best and possibly only chance for robust protection."

Although recent news stories have featured people who opted to receive monoclonal antibodies after they became ill instead of getting vaccinated, experts don't consider this an optimal approach. Antibody therapy must be administered via IV infusion or injection and it is expensive, at about $2,000 per course. Vaccines, on the other hand, are effective, safe, readily available and free. What's more, vaccines train the immune system to produce its own antibodies, while monoclonal antibodies generally only work for a few months at most.

Oral antivirals in the pipeline could make COVID-19 PEP and PrEP simpler and less expensive. Molnupiravir (a nucleotide analog in the same broad class as certain drugs used to treat HIV, hepatitis C and influenza) was recently shown to cut the risk of hospitalization in half when taken within five days after developing symptoms. Merck has requested FDA emergency use authorization. A course of treatment is expected to cost around $700.

UPDATE: On November 5, Pfizer announced that its SARS-CoV-2 protease inhibitor Paxlovid (PF-07321332) reduced the risk of hospitalization or death by 89% when taken within three days of symptom onset. Pfizer has also requested FDA authorization; the company did not announce a price.

While oral COVID-19 medications will be easier to use than monoclonal antibodies, experts do not expect that either option will be used the same way as HIV PrEP. Anyone at substantial risk for HIV acquisition through sexual contact or shared drug injection equipment is eligible for the HIV PrEP pills Truvada (tenofovir disoproxil fumarate/emtricitabine) or Descovy (tenofovir alafenamide/emtricitabine), and health officials encourage almost everyone at risk to use them.

For COVID-19, in contrast, vaccines are the best way to prevent serious illness and death and reduce the risk of transmission. (While many wish there were vaccines for HIV, these have proven much harder to develop than SARS-CoV-2 vaccines.) But for immunocompromised people who are not fully protected by the vaccines and face the prospect of ongoing isolation as society starts to get back to normal, monoclonal antibodies or antiviral pills for COVID-19 prevention could be a game-changer.

Editor's note: This article was originally published on October 20, 2021; it has been updated to add Pfizer's announcement of Paxlovid study data.

This article was originally published on October 20, 2021.

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