23 March 2020

BRIEF-19

A daily review of covid-19 research and policy.

RESEARCH BRIEFING

Why is obesity a risk factor for severe and fatal coronavirus infection?

Obesity appears to be a risk factor for developing severe illness from coronavirus infection. We've long known that obese patients' lungs cannot fully inflate. This is known as obesity hypoventilation syndrome. Obesity hypoventilation syndrome puts affected patients at a significantly increased risk for respiratory failure during lung infections such as SARS-nCov-2. Recently, an additional hypothesis has been offered regarding why obese patients are more susceptible to more severe covid-19-related illness. Previous research shows that the SARS-nCov-2 virus latched onto lung cells by landing on "ACE2 receptors" which viruses then use to get inside. Fat cells, called adipocytes, also have ACE2 receptors. It therefore follows that obese patients possess more of these receptors, making them more susceptible to SARS-nCov-2 infection. Experiments using mice have shown that high-fat diets increase the number of ACE2 receptors. However, this has not been established in humans. In fact, emerging data evaluating ACE2 receptor levels in both obese and non-obese patients suggests that obesity may not actually affect ACE2 expressions in human fat cells. This preliminary work suggests that the adipocytes of obese patients do not have more ACE2 receptors per fat cell; however, since obese patients have more adipose cells, this is likely to increase the overall quantities of ACE2 receptors when compared to non-obese patients. To complicate matters, some other data suggest that the ACE2 receptor may paradoxically protect against a condition of lung failure known as severe respiratory distress syndrome. Clearly, more research is needed to understand the role of obesity in SARS-nCov-2 infection.

Covid-19 infection without radiographic findings?

In a paper published in the *European Journal of Radiology*, 295 patients with laboratory confirmed SARS-nCov-2 infection were identified in the Guangdong Province of China. All patients were imaged with computed tomography of the chest (CT scans). Interestingly, 17 percent of patients had a normal chest CT on initial evaluation. Additionally, 12 percent of all infected patients had normal chest CTs *both* on initial evaluation and on days 3 and 14 of infection, with few or no clinical symptoms. This cohort from the Guangdong Province provides further evidence of higher than previously reported rates of mild and asymptomatic covid-19 infection.

The American Academy of Otolaryngology (AAO) announced reports of patients losing their sense of smell and/or taste without other explanation such as allergies, acute sinusitis, or chronic rhinosinusitis. Such patients should be screened for covid-19 infection. The AAO even suggests that such patients should seriously consider self-isolation. Despite the fact that these reports are "rapidly accumulating from sites around the world," the evidence remains entirely anecdotal.

--Joshua Niforatos MD.

POLICY BRIEFING

Liberating the vent. In normal circumstances, medical device makers are required to file a notification--known as 510(k) notices—with the Food and Drug Administration before making modifications to devices already on the market. Even changing the supplier of a single component or a material requires disclosure. Today, in an effort to encourage manufacturers to produce more mechanical ventilators more quickly, the FDA announced that manufacturers would temporarily not be required to file 510(k) notifications for limited modifications to ventilators, high flow nasal oxygen systems, anesthesia gas machines, and some other related devices. This allows manufacturers to find new suppliers, and possibly increase production immediately. This appears to be an important step in addressing the nation's impending shortage of mechanical ventilators needed to keep some patients alive. Food and Drug Administration.

Off target

Saturday, a Seattle resident tweeted a photo of a cache of N95 respirators sitting on a shelf at a local Target. There was a quick and loud outcry given the severe shortage of respirators facing health care workers. Target quickly announced they would take the masks off the shelf and donate them to the local Department of Health. They also announced a broader inventory review to identify other possible donation opportunities. Twitter.

Collective bargaining

As the SARS-nCoV-2 pandemic has evolved, stories of price gouging on essential supplies are abundant. Individuals are not the only ones who are victims of this practice. States are also facing increased prices on supplies such as masks. In response, today New York Governor Andrew Cuomo called for medical supply purchasing to be nationalized, in order to leverage the collective bargaining power of all of the states. CNBC.

Coronavirus stimulus in jeopardy

The third of three pieces of stimulus legislation is expected to go to the President's desk as early as today. This component of the stimulus package is aimed at the economic effects of the pandemic. Provisions are expected to include cash payouts to citizens, student loan relief, and hundreds of billions of dollars in loans to businesses. In what had initially been expected to be a routine procedural vote, which would have allowed the bill to pass from the Senate to the House, the bill stalled after a 47-47 vote yesterday, failing to advance. Over in the House, many Democrats had raised a number of issues with the legislation. But many observers were surprised that the bill failed in the Senate first, and not the House. Nevertheless, there remains broad agreement among Democrats, Republicans, and President Trump that an economic relief bill is necessary, and so we expect new legislation to be forthcoming. New York Times.

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