

Impact of COVID-19 on Patients With Obesity: What We Know Now

Faculty



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Learning Objectives

- Recognise the specific challenges for patients with obesity during and related to COVID-19 pandemic
- Establish and maintain goals of management for obesity during COVID-19 pandemic
- Counsel patients with obesity on managing stresses related to social distancing and isolation



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Introduction

Patients with obesity are at an increased risk for infection with COVID-19, as well as associated complications. Here, Paolo Sbraccia, MD, PhD addresses the impact the COVID-19 virus and resultant global pandemic has on patients with obesity. Prof Sbraccia outlines what we know now.

Obesity is associated with several mechanisms that increase risk for COVID-19 infection and complications

Before discussing possible mechanisms, it is important to talk about the epidemiologic data we have so far, including evidence from the 2009 H1N1 pandemic. It was reported in the United States that one third of hospitalised patients were obese. In particular, those who were morbidly obese—even in the absence of comorbidities—were at increased risk for hospitalisation and death. Now, from the data that have been published so far, it also seems that the COVID-19 virus has a relatively increased prevalence among patients with obesity; there was a report from France that demonstrated a high frequency of obesity, and above all, an increase in disease severity with increased BMI (Stefan N et al. *Nat Rev Endocrinol.* 2020 Apr 23. doi: 10.1038/s41574-020-0364-6. [Epub ahead of print]). A large academic hospital system in New York City performed a retrospective analysis of BMI stratified by age in COVID-19–positive, symptomatic patients. They found that patients aged <60 years with BMI between 30 to 34 were 2.0 (95% CI, 1.6-2.6; $P < .0001$) and 1.8 (95% CI, 1.2-2.7; $P = .006$) times more likely to be admitted to acute and critical care, respectively, compared with individuals with a BMI <30 (Lighter J et al. *Clin Infect Dis.* 2020 Apr 9. pii: ciaa415. doi: 10.1093/cid/ciaa415. [Epub ahead of print]).

If these preliminary data are representative of an increased susceptibility to COVID-19 infection, what would cause such an increased susceptibility among patients with obesity? Well, obesity causes a chronic state of a so-called meta-inflammation with a systemic impact on immunity. In theory, one may think that the chronic low-grade inflammation should increase defence against virus, but this doesn't seem to be the case. In fact, individuals with obesity tend to exhibit delayed and blunted antiviral responses to influenza virus infection, for example, and they also experience poor disease recovery. Animal models have suggested a long list of possible molecular mechanisms: Decreased antigen presentation, delayed leucocyte recruitment, decreased cytotoxicity, and so forth. But certainly, there are also clinical implications for the risk of patients with obesity to develop respiratory insufficiency. They hypoventilate; they are also likely to have various comorbidities that I call complications of obesity. Therefore, obesity and comorbidity create a vicious cycle of dysregulation.

Common comorbidities also increase risk of infection, as well as severity

Type 2 diabetes is certainly a very important comorbidity, and in this case, is a complication of obesity that has been shown to increase the patient's susceptibility to any infection beyond just COVID-19. This is primarily related to the patient's lack of glycaemic control. This finding underscores the need to achieve individualised HbA1c goals, per international ADA/EASD recommendations, in order to decrease the risk of infection. In addition, if an individual does contract COVID-19, having a controlled HbA1c would minimise the chance for worsened outcome.

Less is known about an association between hypertension and risk of infection. There had been concern that patients receiving therapy with an ACE inhibitor or angiotensin II receptor blocker (ARB) may be at an increased risk for COVID-19. This hypothesis comes from the observation that membrane-bound angiotensin-converting enzyme 2 (ACE2) is involved in the entry of SARS-CoV-2 into human cells, and animal studies have shown that ACE inhibitors and ARBs upregulate ACE2 expression (NEJM Journal Watch: ACE Inhibitors and ARBs During the COVID-19 Pandemic. <https://www.jwatch.org/na51345/2020/04/09/ace-inhibitors-and-arbs-during-covid-19-pandemic>. Accessed 1 May 2020). However, there is no evidence that ACE inhibitors or ARBs worsen patient prognosis (Guzik TJ et al. *Cardiovasc Res.* 2020 Apr 30. pii: cvaa106. doi: 10.1093/cvr/cvaa106. [Epub ahead of print]). The use of ACE inhibitors and ARBs has been found to be more frequent among patients with COVID-19 than among controls in a large population-based study, because of a higher prevalence of cardiovascular disease. However, there was no evidence that ACE inhibitors or ARBs affected the patients' risk of COVID-19 (Mancia G et al. *N Engl J Med.* 2020 May 1. doi: 10.1056/NEJMoa2006923. [Epub ahead of print]). In fact, when investigators reviewed patient charts, they confirmed that there was no substantial increase in the likelihood of a positive COVID-19 test, or in the risk of severe COVID-19 among patients who tested positive in association with their antihypertensive medication (Reynolds HR et al. *N Engl J Med.* 2020 May 1. doi: 10.1056/NEJMoa2008975. [Epub ahead of print]).

Finally, the side effects associated with sleep apnoea are many; it is a known risk factor for various cardiac and respiratory complications. Many patients with obesity are already using CPAP to manage sleep apnoea, which reduces the risk of the obesity hypoventilation syndrome. This is a positive of course, but on the other hand, if an individual with obesity is infected, the CPAP may increase COVID-19 viral shedding and pose a risk to anyone else in the household. Therefore, we need to educate patients about how to properly handle CPAP under quarantine conditions.

What clinicians can do now to help patients with obesity

Let's talk about two scenarios: First, there are the patients who do not have any comorbidities or complications. The most important aspect here for patient management—which is challenging, I recognise—is to maintain patient follow-up. Being isolated at home, with a house full of food and limited opportunity for exercise can result in easy weight gain. Therefore, we need to continually encourage the normal strategies for weight control: online support groups, some form of daily physical activity (eg, 20 min in the morning; 20 min in the afternoon), and mindfulness about food intake. For the approximate 10% of patients with obesity who have eating disorders, food management may be extremely difficult. This highlights the need for telemedicine (whether video- or telephone-based) when following patients with obesity in an attempt to curtail the “metabolic explosion” that can happen during quarantine.

On the other hand, there are patients with obesity who do have complications as we discussed in the previous question. These comorbidities just add to the burden of control: weight control, glycaemic control, blood pressure control, etc. For these patients, encouraging physical activity is also important since physical activity is a potent stimulator of innate immunity and hence, viral clearance.

Obesity is a disease and must be treated accordingly

Obesity, unfortunately, is not widely accepted and recognised as a disease and routine management of individuals with obesity is certainly underpowered for many, many reasons. That means the vast majority of patients with obesity all over the world are not only under-recognised, but under-treated. This is even worse given that hospitals and healthcare settings are either shut down or now dedicated to COVID-19 needs. Without outpatient services, there is an increased strain on obesity management. For example, patients will abandon educational support groups, many may become nonadherent to anti-obesity medications, and patients may also lose tight glycaemic control without ongoing resources at their local clinics or hospitals. This then adds to the already increased risk of infection. I fear that obesity will represent another population of frail and fragile individuals, like the elderly, who will pay the highest toll in this pandemic.

So moving forward, we need to make a significant effort to regain access to patients with obesity and change our mind set in how we holistically manage obesity.

Summary

So, to conclude, it is important for clinicians to view obesity as a disease state and manage it accordingly. In other words, we need to move beyond the long-held mantra of “eat less, move more,” and recognise that there are a variety of genetic, hormonal, and mechanistic factors at play for patients with obesity. We then must layer in the psychological impact of isolation and fear, and manage our patients with obesity as we would manage patients with other treatable conditions.

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