Transcript Details

This is a transcript of an educational program. Details about the program and additional media formats for the program are accessible by visiting: https://reachmd.com/programs/medical-industry-feature/understanding-high-risk-factors-associated-with-progression-to-severe-covid-19/16052/

ReachMD
www.reachmd.com
info@reachmd.com
(866) 423-7849

Understanding High-Risk Factors Associated with Progression to Severe COVID-19

ReachMD Announcer:
Welcome to ReachMD. This medical industry feature is titled "Understanding High Risk Factors Associated with Progression to Severe COVID-19". This podcast is intended only for healthcare professionals in the United States and is intended to be listened to as it was originally produced by Pfizer Medical Affairs. This promotional activity is not certified for continuing medical education.

Voiceover:
COVID-19 disease severity ranges from asymptomatic to mild or moderate symptoms to severe or critical illness. Although many patients recover without progression to severe illness, some individuals who have high-risk factors are at increased risk of severe COVID-19. Severe outcomes of COVID-19 are defined as hospitalization, admission to an intensive care unit, ventilatory support, or death. Risk of progression to severe COVID-19 illness may be higher due to several factors.

Obesity in adults, defined as a body mass index, or BMI, of ≥30 kg/m2, worsens the mechanics of breathing, increasing susceptibility to infection and making ventilation more difficult. It is also associated with impaired immune function and with a higher risk of venous and arterial thrombosis. The risk of severe COVID-19 illness rises sharply with higher BMI: patients with obesity are at a higher risk of requiring hospitalization, with patients with a BMI of over 45 facing a 33% increased risk compared with those with a BMI between 18.5 and 24.9. Patients with obesity are also at an increased risk of requiring invasive mechanical ventilation, with up to a 108% risk increase for those with a BMI of 45 or higher. Risk of death increases with higher BMI as well. Patients with obesity are at a higher risk of death due to COVID-19, with those with a BMI over 45 facing a risk of death 61% higher than people with a BMI between 18.5 and 24.9. Finally, patients with obesity who develop COVID-19 may be more likely to experience long COVID compared with the overall population.

Age is the strongest risk factor for severe COVID-19 outcomes, which may lead to hospitalization or death. The risk of severe outcomes is increased in people of all ages with certain underlying medical conditions and in people who are 50 years and older, with risk increasing substantially at ages beyond 65 years. COVID-19 mortality risk increases significantly with age. In patients between 50 and 64 years of age, the mortality risk is more than fourfold compared with those aged 18 to 39 years. Among those hospitalized with COVID-19 in the US, the risk of admission to an ICU and of requiring invasive mechanical ventilation is highest in patients aged 65 to 74 years. The COVID-19–related death rate among people aged 50-64 years is 25 times higher than in those aged 18 to 29 years. The incidence and severity of comorbidities that are themselves high-risk factors for COVID-19 increase with age, further augmenting the risk of severe outcomes.

The presence of certain heart conditions, such as heart failure, cardiomyopathies, and coronary artery disease, can double the risk of developing severe COVID-19 illness, which may lead to hospitalization or death. COVID-19 may trigger destabilization of chronic cardiovascular disease. In patients with COVID-19, the presence of coronary atherosclerosis and other heart conditions confers a 14% higher relative risk of death, and an increased risk of requiring invasive mechanical ventilation and ICU admission compared with patients without heart conditions. Pre-existing atrial fibrillation is a common heart condition, present in about 11% of COVID-19 cases: in these patients, it is associated with a more than doubled risk of mortality. The increased risk of severe COVID-19 also affects younger patients: those aged 18–39 with hypertension are at higher risk of death, of requiring invasive mechanical ventilation, and of intensive care admission compared with those without hypertension. Moreover, COVID-19 infection can cause damage to the myocardium, predisposing patients to the development of cardiovascular disorders.

The COVID-19 pandemic has highlighted racial, ethnic, and socioeconomic disparities in COVID-19 illnesses, hospitalizations, and

deaths. Compared with non-Hispanic White people, those from certain racial and ethnic minority groups are more likely to be hospitalized, be admitted to the ICU, and die from COVID-19 at a younger age. Also, certain racial and ethnic minority groups, such as Hispanic and non-Hispanic Black adults, are disproportionately affected by obesity, and therefore more likely to experience worse COVID-19 outcomes than White patients. Fewer people from certain minority groups received monoclonal antibody outpatient treatment to prevent severe COVID-19, and they were less likely to receive treatment for COVID-19 compared with White and non-Hispanic individuals. Inequities in healthcare access deeply affect certain racial and ethnic minorities. Some racial and ethnic minority groups are also more likely to face multiple barriers to accessing healthcare, including lack of insurance, transportation, child care, or ability to take time off from work.

The immune system of patients with cancer is often compromised and further weakened by immunosuppressive therapies, resulting in a decreased ability to fight off infections. The presence of cancer results in higher COVID-19–related mortality rates compared with the overall population. Receiving certain cancer treatments raises the likelihood of COVID-19–related death even further. Risks of invasive mechanical ventilation, ICU admission, and hospitalization also increase proportionally. Certain types of cancer, such as acute leukemia, thyroid cancer, and male genital cancer, are associated with an increased risk of COVID-19 infection and death compared with other cancer types. Mortality rates also increase after a recent cancer treatment and upon use of certain cancer therapies.

Diabetes is a common comorbidity in patients with COVID-19. Several biochemical and immunological pathways that are dysregulated in patients with complicated type 2 diabetes contribute to increasing the risk of COVID-19 infection and its severity. By interacting with other risk factors, hyperglycemia might modulate immune and inflammatory responses, thus predisposing patients to severe COVID-19 outcomes. In addition, patients with type 2 diabetes are likely to have other conditions of metabolic syndrome (including obesity, hypertension, and dyslipidemia), cardiovascular disease, or chronic kidney disease, further increasing the risk of severe COVID-19 illness. Patients with COVID-19 and complicated diabetes are at a 26% increased risk of COVID-19–related death, a 43% increased risk of invasive mechanical ventilation, and a 16% increased risk of ICU admission.

Smoke exposure increases the expression of angiotensin-converting enzyme 2 (or ACE2) receptors in the respiratory tract, elevating the risk of infection, increasing viral load, and, in turn, promoting further dissemination of the virus. Current and former smoking status is significantly associated with severe COVID-19 outcomes, including worsening illness during hospitalization, ICU admission, and death. Smoking is a key cause of chronic obstructive pulmonary disease (or COPD): 38% of the nearly 16 million adults diagnosed with COPD in the United States are people who report current smoking. In patients with COPD and bronchiectasis, the relative risk of COVID-19–related mortality is 18% higher than in patients without COPD and bronchiectasis; the risks of invasive mechanical ventilation and ICU admission are also increased. Smoking cessation is an important intervention for COPD and may reduce the probability of developing severe COVID-19 outcomes.

Certain mental health disorders such as mood disorders (including depression) and Schizophrenia spectrum disorders can increase the risk of developing severe COVID-19 illness, which includes hospitalization or death. The reasons for this increase in risk are multifactorial, and may include difficulties in accessing care and following safeguarding procedures, comorbidities such as obesity and cardiovascular disease, a dysregulated immune response, or the immunomodulatory and cardiovascular effects of medications frequently used to treat several mental disorders. Large-scale studies have shown that patients with mood disorders, including bipolar disorder and, more markedly, those with depression, are at an increased risk of hospitalization with COVID-19 and death compared with the general population. Additionally, patients with more severe mental health disorders, including bipolar disorder and/or schizophrenia spectrum disorder, are at an even greater risk of death from COVID-19, compared with the general population.

Cerebrovascular disease is associated with an increased risk of severe COVID-19, including hospitalization or death following infection. A meta-analysis found an association between cerebrovascular disease and and poor outcomes in patients with COVID-19, independent of cardiovascular disease. However, cerebrovascular and cardiovascular disease share several risk factors, such as chronic kidney disease, hypertension, and diabetes, which associated with an increased risk of mortality for patients with COVID-19. In particular, stroke survivors often have high blood pressure, diabetes, and other conditions that increase the risk of developing severe COVID-19. Other hypotheses to explain the increased risk in patients with cerebrovascular disease relate to the presence of brain medullary cardiorespiratory or autonomic nervous system dysfunction, or the suppression of pulmonary innate immunity; these may increase the risk of contracting viral and bacterial infections.

Chronic kidney disease (or CKD) is one of the most prevalent high-risk factors for severe COVID-19 and is strongly correlated with severe COVID-19 illness. In patients with COVID-19, the relative risk of death is 21% higher in patients with CKD compared with those without; the risks of invasive mechanical ventilation and ICU admission are also increased. In a different analysis with pooled data from 20 primary studies, CKD was associated with a 48% increased risk of COVID-19–related mortality compared with patients without CKD. However, as renal function declines, the risk of severe COVID-19 illness progressively increases, with patients with CKD stage 4 and 5 having the highest risk. Patients with end-stage renal disease receiving dialysis and those who have received a kidney transplant have

weakened or less active immune systems, making them more vulnerable to infection and severe COVID-19 outcomes. The risk of death from COVID-19 is higher in patients who have had a kidney transplant compared with those on dialysis.

The presence of certain underlying conditions is a key factor influencing the risk of progression to severe COVID-19 illness. Many of these conditions are chronic, and their potential impact also needs to be considered in relation to outcomes beyond the initial infection. The initial infection and long-lasting effects of COVID-19—known as long COVID—negatively impact pre-existing comorbidities, such as mental health disorders and cerebrovascular disease. These effects can also increase the risk of developing certain comorbidities, such as diabetes, acute kidney injury, and end-stage renal disease. Early recognition of patients who are at high risk of becoming seriously ill from COVID-19 is important to improve their management and outcomes. To minimize the risk of infection and progression of COVID-19 disease, advise your patients to stay up to date with their COVID-19 vaccination, to test for COVID-19 as soon as possible after presenting symptoms, and not to delay seeking care if they test positive and are at high risk of progression to severe illness.

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