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LETTER TO THE EDITOR

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Is prediabetes a risk factor for severe COVID-19?

To the Editor,

Several studies, including those published in the *Journal of Diabetes*, have investigated the association between coronavirus disease 2019 (COVID-19) and type 2 diabetes.[1-3] In general, these studies have shown that type 2 diabetes is a common comorbidity in hospitalized COVID-19 patients, and those with type 2 diabetes often present with a poor clinical profile and experience severe outcomes of COVD-19. Further, emerging evidence increasingly suggests that COVID-19 may unmask previously undiagnosed diabetes as well as cause new-onset diabetes.[4-6] However, relatively little is known about prediabetes and COVID-19.[7] In a multicenter study by Sourji et al at 10 hospital sites in Austria, of 238 COVID-19 patients, 47 (19.7%) had prediabetes (admission glycosylated hemoglobin [HbA1c] 5.7%-6.4%), of which 17% were admitted to the intensive care unit and 14.9% died during hospitalization.[8] In a study by Bhatti et al of 410 COVID-19 patients admitted to a single hospital in Dubai, UAE, 10 (2.4%) had prediabetes (prior diagnosis or admission HbA1c 5.7%-6.4%), of which 20% had in-hospital mortality.[9] In a study by Smith et al of 184 patients hospitalized for COVID-19 at a single hospital in New Jersey, USA, 44 (23.9%) had prediabetes (admission HbA1c 5.7%-6.4%), of which 15.9% required invasive mechanical ventilation.[10] In a study by Wang et al conducted among 605 COVID-19 patients admitted at two hospitals in Wuhan, China, 100 (16.5%) had prediabetes (admission fasting plasma glucose [FPG] 6.1-6.9 mmol/L).[11] About 48% of these patients developed complications (eg, acute respiratory distress syndrome, acute cardiac injury) within 28 days of hospitalization. Besides, Kaplan-Meier survival curves showed that those with prediabetes had significantly lower rates of survival within 28 days of hospitalization than those with FPG <6.1 mmol/L ($P < .0001$). In a hospital-based study by Tee et al in Singapore among 240 male migrant workers infected with COVID-19, 21 (8.8%) had prediabetes (admission HbA1c 5.7%-6.4% and/or 2-hour post load plasma glucose 7.8-11.0 mmol/L).[12] In this study, compared with normoglycemia, prediabetes was significantly associated with a higher risk of pneumonia (crude odds ratio [OR] 10.8; 95% CI, 3.65-32.1), hyponatremia (crude OR 8.83; 95% CI, 1.17-66.6), and hypokalemia (crude OR 4.58; 95% CI, 1.52-13.82). These findings suggest that those with prediabetes are likely to develop severe outcomes of COVID-19. This could be, at least in part, due to exacerbation of the underlying pathophysiology of prediabetes, including chronic low-grade inflammation, impaired innate immunity, poor adaptive immune response to infections, and pro-coagulative state.[7] Age, comorbidities (eg, hypertension), and obesity may also contribute to the risk of severe outcomes. However, none of these studies have examined the risk factors for disease severity and in-hospital mortality in patients with prediabetes. These shortcomings call for further research in this area.

Prediabetes is highly prevalent in most populations globally, and worryingly, the majority of people with prediabetes are unaware of their diagnosis.[13] Thus, it is essential to screen all COVID-19 patients at the time of hospital admission with HbA1c and/or plasma glucose to identify those with prediabetes[14] so that they can be closely monitored and appropriate treatment can be initiated early to improve their prognosis.

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CONFLICT OF INTEREST

None declared.

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