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Independent Impact of Diabetes on the Severity of Coronavirus Disease 2019 in 5,307 Patients in South Korea: A Nationwide-Cohort Study (*Diabetes Metab J* 2020;44:737-46)

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Accelerated spread of coronavirus disease 2019 (COVID-19) has led to the COVID-19 pandemic. Previous studies reported that old age [1], diabetes [2], obesity [3], chronic cardiac disease, and chronic pulmonary disease [4] are associated with poor prognosis of COVID-19. Many of these studies were based on data from hospitalized patients. Therefore, whether these findings are consistent in unhospitalized patients remains unclear, especially in South Korea.

In this article entitled, "Independent impact of diabetes on the severity of coronavirus disease 2019 in 5,307 patients in South Korea: a nationwide-cohort study," Moon et al. [5] aimed to elucidate the association between diabetes and clinical outcomes of COVID-19 using nationwide claims data regardless of hospitalization. That was the main strength of the study, which included the entire national population when assessing the association between diabetes and worse clinical outcomes regardless of hospitalization. Among 5,307 patients, COVID-19 patients with diabetes had a higher rate of severe outcomes, including oxygen treatment, ventilator use, and mortality, than those without diabetes. Even after adjustment for other risk factors, the risk of severe outcomes was higher in patients with diabetes than in those without diabetes. These findings are in line with recent studies [6,7].

However, there are several issues to be discussed with regard to this study. First, the definition of diabetes was based on a prescription for antidiabetic drugs in the one year before diagnosis of COVID-19. Considering that 37.4% of patients with diabetes were undiagnosed and 43.1% of diabetes in South Korea did not receive treatment [8], the criteria used in this study may have underestimated diabetes, which is not negligible. Furthermore, Li et al. [9] recently showed that newly diagnosed diabetes was related to a higher risk of mortality compared to established diabetes. Secondly, the severity of diabetes such as the level of glycosylated hemoglobin, diabetes duration, and insulin use were not addressed. At least insulin use could be captured from medical claims data. Considering that poorly controlled blood glucose is associated with higher mortality in patients with COVID-19 and type 2 diabetes mellitus [6], it would be useful to consider the severity of diabetes. In addition, the presence of obesity, based on either diagnostic code or body mass index, was not addressed. Obesity is an independent risk factors for severe COVID-19 [3] and it is interrelated with diabetes. Lastly, outcome differences between regions were not addressed. By May 15, 2020, about 80% of COVID-19 patients were confirmed to reside in the Daegu-Gyeongbuk province, and therefore there were shortages of inpatient beds and other healthcare resources in this province [10]. Under the circumstances, if the authors analyzed the data

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according to the location, we could further explore the influence of scarce healthcare resources on outcomes.

In conclusion, this nationwide population-based cohort study demonstrated that diabetes was associated with worse clinical outcomes in patients with COVID-19. This finding provides important insights into the prevention and treatment of COVID-19 in patients with diabetes. However, further analysis including key parameters such as the severity of diabetes and obesity is necessary for a better understanding.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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