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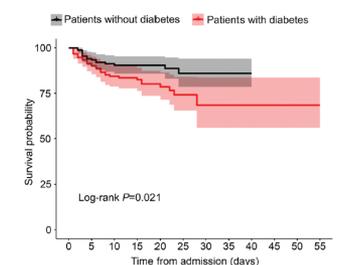
COVID-19 and Diabetes—Worrying Developments From Early Reports

In a commentary for *Diabetes Care*, Riddle et al. (p. 1378) distill some early lessons from initial reporting on COVID-19 and diabetes, as well as from a series of articles on the pandemic that are published in this issue of the journal. From early Chinese and U.S. studies on clinical characteristics of COVID-19 patients, it has become clear that individuals with diabetes have experienced higher mortality and more severe illness than individuals without diabetes. In terms of the articles in this issue, they highlight Shi et al. (p. 1382, see summary below), who looked at early outcomes in COVID-19 patients with diabetes in two hospitals in Wuhan, China, finding much higher mortality and comorbidities in individuals with diabetes. They also consider the risks associated with obesity (Cai et al., p. 1392; Gao et al., p. e72) and the effects of glucose-lowering therapy in diabetes and how it might affect mortality from COVID-19 (Chen et al., p. 1399). The authors also look at the study by Sardu et al. (p. 1408) that highlights the growing concern around glycemic control in COVID-19 and a report from Shehav-Zaltzman et al. (p. e75) on the use of remote continuous glucose monitoring in intensive care to address unusual insulin requirements that are seen in some COVID-19 patients. Finally, they also highlight Rao et al. (p. 1416), who address the issues surrounding angiotensin-converting enzyme 2 (ACE2) as a site for viral attachment and whether diabetes and particularly ACE2 inhibitors make COVID-19 outcomes better or worse—a debate that continues for the time being. They point toward the developing story as worrying and affirm that there is much for clinicians to digest from these early reports. Commenting more widely, author Matthew Riddle told us: “The threat from COVID-19 is not just a scientific, clinical, personal, or public health issue—but all of these together. The whole diabetes community needs more facts to guide decisions and find solutions. This story is just beginning.”

Clinical Characteristics and Risks for COVID-19 Patients With Diabetes in Wuhan, China

The clinical characteristics of some of the patients with diabetes in Wuhan, China, who also contracted COVID-19 are described by Shi et al. (p. 1382). They report that patients with both diseases had worse outcomes compared with other COVID-19 patients and tended to have more comorbidities such as hypertension and cardiovascular disease. The findings come from a retrospective analysis of records from two of the hospitals in the city. Over the first 3 months of 2020 they identified 1,561 patients with COVID-19, of whom 153 individuals also had diabetes. They then matched each diabetes patient with one sex- and age-matched control patient with COVID-19 alone for comparison. In the group with diabetes there was a significantly higher proportion of intensive care unit admissions (~18% vs. ~8%) and higher proportion of fatal cases (~20% vs. ~10%) compared with the control group. While diabetes itself was not independently associated with death, among patients with diabetes, nonsurvivors tended to be older, male, and more likely to have comorbidities such as hypertension and cardiovascular disease. Age and hypertension were independent risk factors for hospital death in individuals with diabetes, while age was the only risk factor for individuals without diabetes. The authors note that while they were not able to look at BMI as a potential risk factor in their study, emerging evidence suggests that obesity might be an important additional risk factor involved in poorer outcomes. Commenting further, lead author Qiao Shi told us: “In the global outbreak of COVID-19, our study reveals that more attention should be paid to individuals having diabetes, especially with advanced age and/or underlying hypertension. Furthermore, careful monitoring and control of blood glucose will benefit COVID-19 patients in clinical practice, although the level of blood glucose can be impacted by the severity of disease, treatment, and other factors. We believe our study will have important implications for reminding more health care providers and scientists to focus on this large community of diabetes.”

Riddle et al. COVID-19 in people with diabetes: urgently needed lessons from early reports. *Diabetes Care* 2020;43:1378–1381



Survival curves of COVID-19 patients with diabetes (red) and matched patients without diabetes (black). The gray and pink areas represent 95% CIs.

Shi, Zhang, and Jiang et al. Clinical characteristics and risk factors for mortality of COVID-19 patients with diabetes in Wuhan, China: a two-center, retrospective study. *Diabetes Care* 2020;43:1382–1391

ADA/EASD Consensus Report on Precision Medicine in Diabetes

A consensus report from the ADA and the European Association for the Study of Diabetes (EASD), authored by Chung et al. (p. 1617), looks at the current state of precision medicine in diabetes. The report also presents some of the latest progress of the Precision Medicine in Diabetes Initiative, which is a partnership between the two associations that is looking at the potential implementation of this approach in diabetes. With the initiative scheduled to run well beyond 2025, the report is the first of a series of forthcoming publications and sets out the foundations for precision medicine in diabetes. It also considers the steps that are likely needed for widespread clinical implementation of precision diabetes medicine. The authors look at how precision diagnostics may motivate a reclassification of diabetes, beyond the existing categories of type 1 and 2 diabetes. In particular, they highlight the current diagnostic approach to monogenic diabetes as being a clear example of precision diabetes medicine in practice. In terms of precision therapeutics, they also report on approaches toward prevention and treatment across the spectrum of diabetes and look at the different possible areas for improvement and potential barriers to success. They focus in particular on different drug treatments and the role of genetics in determining outcomes, and they touch on the role of diet and nutrition in the prevention of diabetes. They also consider the role of ethnic diversity and how molecular and clinical data can aid understanding of the variable prognoses seen across different populations. Commenting further, author Paul Franks told us: “People with monogenic forms of diabetes already benefit from precision diagnostics and precision treatments. But precision diabetes medicine for most patients with diabetes is still on the horizon. What we are doing within the Precision Medicine in Diabetes Initiative will, in the years to come, help realize the potential of precision medicine for all people at risk of or with diabetes, regardless of the specific type.”

Chung et al. Precision medicine in diabetes: a consensus report from the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). *Diabetes Care* 2020;43:1617–1635

Type 2 Diabetes Prevention Programs and Sugar Taxation Are Likely Cost-effective: Systematic Review

An expansion in insurance-covered diabetes prevention programs (DPP) and simultaneous implementation of a tax on sugar-sweetened beverages could be a cost-effective way to tackle rising rates of type 2 diabetes according to Zhou et al. (p. 1593), who report the outcomes of a systematic review into the cost-effectiveness of a number of potential diabetes prevention approaches. The review covers 39 studies published in the years 2008–2017 and used incremental cost-effectiveness ratio (ICER) measured in cost per quality-adjusted life year (QALY) and a cut-off of \$50,000 per QALY to determine cost-effectiveness. The authors found that both lifestyle and metformin interventions among high-risk populations were cost-effective compared with no intervention, with median ICER/QALY of \$12,500 to \$17,000, respectively. For lifestyle interventions that followed DPP curricula, cost-effectiveness was much better than for non-DPP lifestyle interventions. They also found that compared to individual DPP offered by a health care professional, group delivery of DPP from a mix of health professionals was generally more cost-effective. Also, in-person delivery as opposed to virtual delivery was more cost-effective, although the authors note that virtual delivery would still have value in settings such as rural communities. In terms of population-based approaches, they found that taxation on sugar-sweetened beverages would be cost-saving. Other approaches such as fruit and vegetable subsidies, community-based interventions, and changes to the built environment showed a more mixed picture in terms of cost-effectiveness or savings. Commenting further, author Ping Zhang added: “Type 2 diabetes is a major global public health problem. Investing in type 2 diabetes prevention, using programs that target high-risk individuals and population-based approaches that focus on the whole population regardless of the level of risk, is an efficient use of health care and societal resources. Targeting high-risk individuals and the general population could be an effective strategy to prevent type 2 diabetes in the U.S. and possibly in other high-income countries.”

Zhou et al. Cost-effectiveness of diabetes prevention interventions targeting high-risk individuals and whole populations: a systematic review. *Diabetes Care* 2020;43:1593–1616