Challenges of diabetes management during the COVID-19 pandemic

How to deal with diabetes and COVID-19 — do we just dial in?

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The emergence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and the subsequent announcement by the World Health Organization of a global pandemic, has altered health care across the public and private sectors. Clearly, coronavirus disease 2019 (COVID-19) is having a huge impact on general practitioners, emergency physicians, respiratory physicians, intensivists and related staff, and is also impacting the day-to-day delivery of chronic health care.

Conditions such as type 1 and type 2 diabetes require regular, usually face-to-face contact with GPs, endocrinologists, diabetes educators, dieticians and podiatrists to optimise glycaemic control. However, with recommendations regarding social isolation to minimise spread of COVID-19,[1] the delivery of such health care is increasingly being delivered using telehealth. This has been greatly facilitated in Australia with the announcement of temporary Medical Benefits Schedule telehealth (videoconference and telephone) item numbers during the COVID-19 pandemic.[2] The eligibility criteria for bulk-billing include individuals who are immunosuppressed or with chronic health conditions, which include diabetes mellitus. Significantly, the eligibility criteria also include pregnancy. At a time when individuals are being asked to socially isolate to minimise exposure to SARS-CoV-2, many who greatly need ongoing health care are avoiding these appointments out of fear of infection from those also attending the clinic and perhaps from clinicians, who are recognised to be at high risk of infection. It is therefore crucial that telehealth care services are offered (and if not available, fast tracked). This may be via videoconference, or a phone call for those who are less able to use newer technologies or if videoconferencing services are not available. Services traditionally offered in a group setting, such as group education for those with gestational diabetes or type 2 diabetes, may also be delivered via this technology.

The use of diabetes management technology can benefit health care and telehealth consultation. Continuous or flash glucose monitoring can be used with both type 1 and 2 diabetes with therapeutic benefit. Many of these devices upload automatically to cloud-based software. Other devices such as insulin pumps and blood glucose meters can be uploaded by the user before the consultation, which places a greater burden on the individual. Involvement of parents, carers and diabetes educators before the appointment may be of benefit. This may lead to improvements in individual diabetes self-management.

The electronic medical record is vital in updating changes to medications, results and scheduled appointments. Many pathology providers facilitate electronic access to test results, but anecdotally some patients may avoid having pathology tests taken in order to minimise travel and exposure to others.

The individuals who are at greatest risk of complications from COVID-19 are still being determined. It seems clear that those with diabetes and other chronic comorbidities are at increased risk of morbidity. A number of small observational studies have analysed comorbidities in individuals with severe SARS-CoV-2 infection from China. Rates of diabetes (type unspecified, but most likely to be type 2 diabetes given the low incidence of type 1 diabetes in China[3]) are reported between 7.4% in confirmed cases infection,[4] and up to 17% in cases with severe pneumonia.[5] A recent meta-analysis of six studies (including 1527 people) analysed the prevalence of comorbidities among individuals with severe and non-severe COVID-19.[6] Diabetes complicated 11.7% of severe cases compared with 4% of cases of non-severe COVID-19. This did not reach statistical significance; however, this is clearly limited by a lack of statistical power and further analyses are required. Retrospective analysis of survivors and non-survivors of the 2002–2003 SARS coronavirus outbreak suggested that diabetes was a predictor for mortality.[7] This association seemed to be driven by glycaemic control, with an independent association with elevated fasting plasma glucose. This further highlights the need to maintain ongoing medical care to optimise glucose control throughout the current COVID-19 pandemic.

All people who currently smoke should be advised to cease smoking. In addition, receiving the recently available influenza vaccine, which is usually recommended for people with diabetes, would be advisable, although patients should be aware that this will not protect against COVID-19.

Individuals with both type 1 and type 2 diabetes need to have clear action and sick day plans in the eventuality that they become unwell, and should be encouraged to seek face-to-face care for complications such as myocardial infarction or high risk foot ulcer.

This should be emphasised even for individuals with long standing diabetes, whose initial diabetes education may have occurred years ago. Individuals with type 1 diabetes should have ketone monitoring strips available (preferably blood continuous subcutaneous insulin infusion ketone test strips), know when to test for ketones, and be aware of the need for additional insulin doses (via injection or continuous subcutaneous insulin infusion) during an intercurrent illness. Excellent sick day management resources are available on the websites of the Australian Diabetes Educators Association (https://www.adea.com.au) and National Diabetes Services Scheme (https://www.ndss.com.au).

Individuals using hybrid closed loop insulin pumps should be educated that during illness the wearer may need to exit automatic mode to enable more rapid correction of hyperglycaemia with manual correction boluses of insulin and a temporary increased basal rate.[8] The algorithm within the hybrid closed pump may otherwise not adapt quickly enough to manage hyperglycaemia during acute illness.

With the increased use of sodium–glucose cotransporter type 2 (SGLT2) inhibitors in Australia and internationally, all individuals treated with SGLT2 inhibitors should be educated on the need to withhold these drugs during illness to minimise the risk of ketoacidosis.[9] This should be reiterated to GPs and emergency physicians to screen for SGLT2 inhibitor use in patients presenting with COVID-19 or any illness.

There have been mixed anecdotal reports as to whether non-steroidal anti-inflammatory drugs (NSAIDs) may predispose patients to COVID-19. There has been suggestion that NSAIDs may upregulate angiotensin-converting enzyme 2 (ACE2),[10] and therefore potentially predispose by a similar mechanism suggested for angiotensin receptor blockers (ARBs). Currently there are no guidelines to avoid the use of NSAIDs.

In relation to COVID-19, there is also increasing interest in the use of ACE inhibitors and ARBs in individuals with type 1 or type 2 diabetes and other chronic care conditions, such as diabetes. SARS-CoV-2 binds to ACE2, allowing entrance into the host cells.[11] ACE inhibitors and ARBs can result in upregulation of ACE2 in some tissues in both human and animal models.[10,12,13] However, not all investigators have found a link between these antihypertensives and upregulation of ACE2.[14] It has been proposed that ACE inhibitors and ARBs may theoretically increase susceptibility to COVID-19 by increasing ACE2 levels. However, there is currently no evidence to link the use of these agents to increased risk or severity of COVID-19. Indeed, other research groups have hypothesised that the use of ARBs may be a potential therapeutic modality.[15] Following SARS-CoV-2 binding to ACE2, there is downregulation of ACE2 with subsequent increased angiotensin levels and exacerbation of COVID-19 related lung injury. It has been proposed that the downregulation of ACE2 by ARBs might protect against such injury.[15] Other groups have suggested that ARBs may stabilise the binding of ACE2 to the type 1 angiotensin receptor and may therefore reduce available binding sites for SARS-Cov-2.[16] Currently, there is no evidence to suggest changing antihypertensive therapy, and multiple national and international bodies including the Australian Diabetes Society, Australian and New Zealand Society of Cardiac and Thoracic Surgeons, and the American College of Cardiology and European Society of Hypertension have recommended that ACE inhibitors and ARBs should not be ceased.[17] Trials are currently underway to assess the impact of these agents during COVID-19 infection (https://clinicaltrials.gov). Patients should be encouraged to continue their ACE inhibitor or ARB drugs, and if not prepared to do so, be offered alternative drugs for blood pressure control.

This is a time of great concern to all individuals, and perhaps more so to those who have been informed they are at greater risk of COVID-19 and its complications. This may necessitate a greater state of preparedness. The current advice is that there will be no shortage of insulin supplies or consumables needed for insulin pump therapy or blood glucose monitoring equipment, yet anecdotally, local pharmacy shortages of insulins, ketone strips and oral hypoglycaemic drugs have been reported and are being addressed by government prescription limits. Should patients be unable to obtain their usual prescriptions, suitable alternatives can be recommended to them by their diabetes care clinicians. It is critical that individuals with diabetes and other chronic conditions do not hoard these medical supplies and inadvertently create a critical supply shortage.

Continuation of health care to at-risk individuals is crucial throughout the pandemic. Telehealth is the key for the delivery of such care. It is important that people with diabetes are educated regarding the management of their condition during acute illness, including medication changes. It is also critical that there is no deterioration in the medical management of glycaemia and other complications of diabetes, which, if neglected, may result in increased morbidity and mortality independent of COVID-19.

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