MEDICATION MANAGEMENT IN AGED CARE WHILE MITIGATING COVID-19

DIABETES

People with diabetes are more susceptible to COVID-19 (coronavirus) infection and have worse outcomes, including ICU admission and death.[1]

KEY POINTS

People with diabetes are more susceptible to COVID-19 infection and have worse outcomes, including ICU admission and death.

Poorly controlled diabetes is associated with worse outcomes with respect to COVID-19 than well-controlled diabetes.

A number of newer oral antihyperglycaemics are available that may allow for cessation of low-dose, once-daily insulin regimens simplification of basal/bolus regimens.

DIABETES AND COVID-19

The most common characteristics of patients with diabetes who have COVID-19 are older age, multiple co-morbidities, obesity, and poorly controlled hyperglycaemia.[2]

A study assessed risks of in-hospital death with COVID-19 for all individuals registered with a general practice in England.[3] They used multi-variable logistic regression to examine the effect of diabetes status, by type, on in-hospital death with COVID-19, adjusting for demographic factors and cardiovascular co-morbidities. Adjusted for age, sex, deprivation, ethnicity, and geographical region, compared with people without diabetes, the odds ratios (ORs) for in-hospital COVID-19-related death were 3·51 (95% CI 3·16-3·90) in people with type 1 diabetes and 2·03 (1·97-2·09) in people with type 2 diabetes.[3]

A meta-analysis of 33 studies, predominantly from China, looked at the association between the presence of diabetes and likelihood of severe COVID-19 (requiring invasive ventilation or admission to intensive care), as well as mortality from COVID-19. The odds ratio for severe COVID-19 (from 24 studies) was 2.75 (95% CI 2.09-3.62) and for mortality was 2.49 (95% CI 1.98-3.14).[4]

Degree of control and outcomes

Poorly controlled diabetes has been associated with worse outcomes in COVID-19.[5] People with an HbA1c of over 10% (over 86mmol/mol) had a 60% higher COVID-19 mortality than those with an HbA1c of 6.5-7.0% (48-53mmol/mol),[6] with a graded hazard ratio between these two levels of control (see **Figure 1**). It is relevant to point out that there was a slight increase in the hazard ratio for patients with an HbA1c of <6.5% (<48mmol/mol).

In the OpenSAFELY database in the UK, an HbA1c above 7.5% (58mmol/mol) had a 1.95 (95% CI 1.83-2.08) hazard ratio for COVID-19 related death, compared to 'well-controlled' diabetes (with an HbA1c of less than 7.5%) with a hazard ratio of 1.31 (95%CI 1.24-1.37), in comparison to individuals without diabetes.[7]

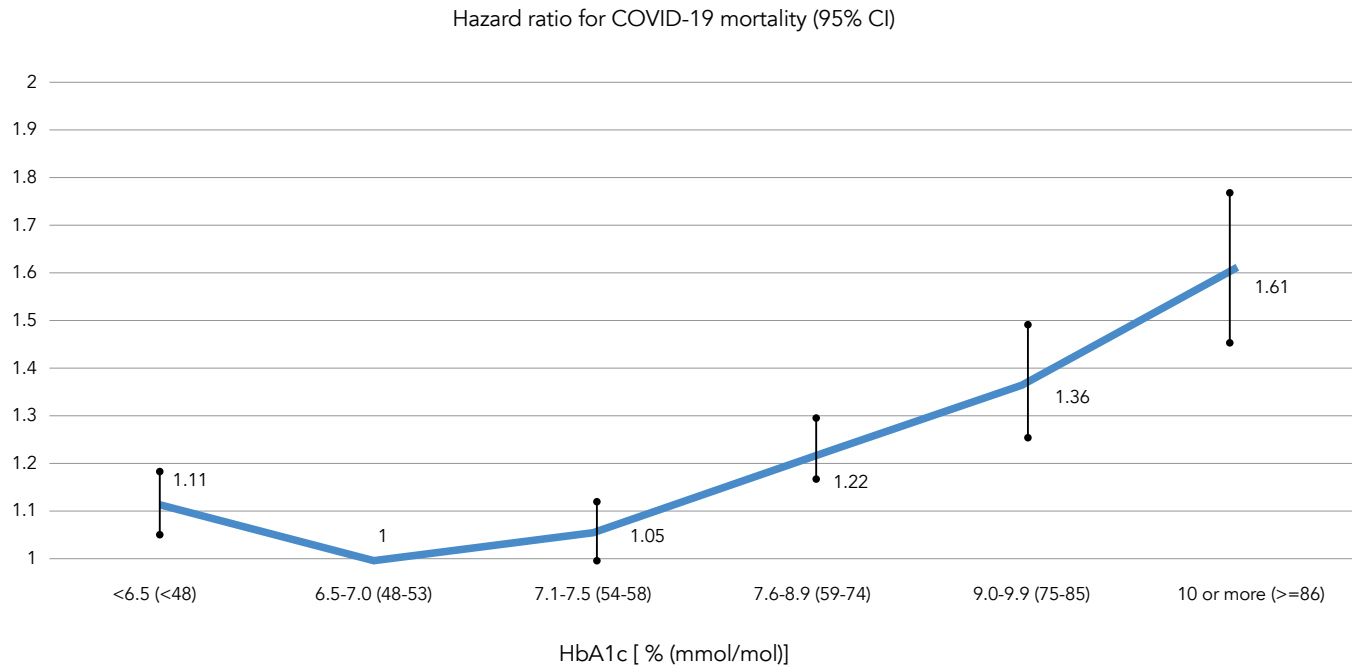

Figure 1: Hazard ratio for COVID-19 mortality for patients with type 2 diabetes[6]

MANAGING DIABETES WHILE MITIGATING COVID-19

Management of diabetes in aged care during a COVID-19 pandemic requires a balance between optimal control and minimising the number of medications and potential for hypoglycaemia. In addition, there should be consideration of minimising the amount of close contact that occurs with insulin injections and BGL testing.

Optimise control of diabetes

When managing diabetes in older people, the presence of co-morbidities and frailty are critical to establishing treatment goals. Tight glycaemic control (HbA1c <7.5% or 58mmol/mol) reduces the frequency of microvascular events and this remains appropriate for people who are robust and have sufficient life expectancy to derive benefit. In terms of mitigating COVID-19, allowing for a higher HbA1c (and a lower risk of hypoglycaemia) would seem appropriate.

Avoid hypoglycaemia

Avoiding hypoglycaemia is a significant consideration in the management of diabetes in elderly patients in residential aged care. Many currently available anti-diabetic medications have a low or minimal risk of causing hypoglycaemia (see **Table 1**) and often an oral regimen with these agents is sufficient to control type 2 diabetes in elderly patients (subject to PBS restrictions).

Avoid ultra short-acting insulins

Many modern insulins contain ultra fast-onset insulin, which requires a more immediate intake of food to prevent hypoglycaemic events. Such agents (as well as slower but still short-acting/onset insulins) have a particularly high risk of hypoglycaemia compared to intermediate or long-acting insulins. Commonly used insulins that are, or contain, ultra-short and short-acting insulins are shown in **Table 2**.

Minimise number of insulin injections

Avoiding basal/bolus insulin regimens and sliding scale insulin regimens for residents in aged care reduces the risk of hypoglycaemic events, reduces the number of injections required, and reduces the number of BGL tests required.

Minimise BGL finger-prick testing

Many oral regimens in patients with type 2 diabetes do not require regular BGL finger-prick testing, as the risk of hypoglycaemia is low. BGL testing could be reserved for situations where BGL is likely to be unstable, such as during infections or when suspecting hypoglycaemia.

Minimise number of dose administration times

Another key factor in mitigating COVID-19 transmission is minimising the number of dose administrations. To this end a number of combination and long-acting preparations of various antidiabetic medications are available, and simplification of some regimens may be possible.

Metformin
Glitazones (Pioglitazone)
Gliptins (Alogliptin, Linagliptin, Saxagliptin, Sitagliptin, Vildagliptin)
SGLT2 inhibitors (Dapagliflozin, Empagliflozin, Ertugliflozin)
GLP1 agonists (Dulaglutide, Exenatide, Liraglutide) – not oral

Table 1: Antihyperglycaemic medications with a low risk of hypoglycaemia

Type of insulin (onset of action)	Examples	Recommended time of administration
Rapid acting (ultra-short acting) **10-15 minutes**	• Insulin aspart (Fiasp, Novorapid) • Insulin lispro (Humalog) • Insulin glulisine (Apidra) Contained in: • Novomix • Ryzodeg • Humalog Mix	Immediately before or with meals
Short acting **15-30 minutes**	• Insulin neutral (Actrapid, Humulin R) Contained in: • Humulin 30/70 • Mixtard	Up to 30 minutes before meals

Table 2: Ultra-short and short acting insulins available in Australia

[1] RACGP. Diabetes management during the coronavirus pandemic: Be proactive and prepared. Available from *https://www.racgp.org.au/getmedia/97a5abb4-1290-42cb-91c0-eabcaa8ca590/Diabetes-management-during-coronavirus-pandemic_1.pdf.aspx* (accessed 2nd March 2021)

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[7] Williamson EJ, Walker AJ, Bhaskaran K, Bacon S, Bates C, Morton CE, Curtis HJ, Mehrkar A, Evans D, Inglesby P, Cockburn J, McDonald HI, MacKenna B, Tomlinson L, Douglas IJ, Rentsch CT, Mathur R, Wong AYS, Grieve R, Harrison D, Forbes H, Schultze A, Croker R, Parry J, Hester F, Harper S, Perera R, Evans SJW, Smeeth L, Goldacre B. Factors associated with COVID-19-related death using OpenSAFELY. Nature. 2020 Aug;584(7821):430-436. doi: 10.1038/s41586-020-2521-4. Epub 2020 Jul 8. PMID: 32640463.

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