COVID-19: diabetes and death. A call to action

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Every day the media publish death statistics. Each death represents an individual person:

'Tributes have been paid to a popular member of a Cornish theatre group who died after contracting coronavirus. Mick Boyles, who lived… near Liskeard, was taken to Derriford Hospital in Plymouth on March 27, but passed away two days later... 78-year-old Mick had an existing heart condition and diabetes… Mick was formerly a partner at a dental practice in Liskeard. He and Ruth were members of the Sterts theatre group for many years… Sterts director Peter Woodward, who had known Mick for around 20 years, described him as a "generous and essentially soft-hearted man".'[1]

Was the fact that this generous, soft-hearted man had diabetes relevant? Yes.

A third of people dying with COVID-19 in hospital had diabetes[2]

Between 1 March and 11 May 2020, people in England alive on 19 February 2020 were included in a population cohort study. The National Diabetes Audit, including data from 98% of general practices in England, was linked to other health data sets to provide a unique analysis of a whole nation's experience of COVID-19 and mortality among people with diabetes. This is the largest study relating to COVID-19.

On 19 February 2020, 61,414,470 people were registered with GP practices among whom 263,830 (0.4%) had type 1 diabetes and 2,864,670 (4.7%) had type 2 diabetes; 41,750 (0.1%) had other forms of diabetes.

By 11 May 2020 there were 23,804 deaths in hospital with COVID-19. Among those who died were 365 (1.5%) people with type 1 diabetes, 7466 (31.4%) with type 2 diabetes, and 69 (0.3%) with other forms of diabetes. Thus a shocking total of 33.2% of all deaths in hospital were among people with diabetes.

'Adjusted for age, sex, deprivation, ethnicity, region and cardiovascular comorbidity, the odds ratio for dying in-hospital with COVID-19 in people with Type 1 diabetes compared to the population without known diabetes was 2.86 and 1.81 for people with Type 2 diabetes.'

Deaths in people with diabetes have more than doubled during the COVID-19 epidemic[3]

The study above only included people who died in hospital. A cohort of people with type 1 or type 2 diabetes in the National Diabetes Audit 2018/19 in England who were alive on 1 January 2020 were followed until 1 May 2020. All weekly deaths, whether in or out of hospital and including those in care homes, were compared with those in previous years.

Among the 3,154,300 people with diabetes, 265,090 had type 1 diabetes and 2,889,210 had type 2 diabetes. In the first four months of 2020, 71,160 of these people had died. The death certificate of 9795 of them included COVID-19, with COVID-19 as the underlying cause of death in 9341 (95.4%). People who were older, men, had black or Asian ethnicity, or were in the most socio-economically deprived groups were more likely to die with COVID-19 than comparators.

Between 3 April and 1 May 2020 more than twice the number of people with diabetes died each week compared with the same weeks in previous years. This equates to 2500–3000 more deaths a week among people with diabetes.

This study included deaths in hospital and the community. Some of the 61,365 people who died without COVID-19 recorded as a cause could still have had the virus. Some may have died because they did not seek or receive usual care for diabetes-related or other problems.

The risk of COVID-19 mortality increases with hyperglycaemia and obesity[3]

After adjusting for other risk factors, the degree of hyperglycaemia was strongly linked to the risk of death with COVID-19. In people with diabetes with an HbA_{1c} ≥86mmol/L (10%) the hazard ratio was 2.19 in type 1 diabetes and 1.62 in type 2 diabetes.

The relationship between BMI and COVID-19 associated mortality was U-shaped. For people with a BMI <20kg/m^2 compared with those with a BMI of 25–29.9kg/m^2 the hazard ratio was 2.11 in type 1 diabetes and 2.26 in type 2 diabetes. These people may have had prolonged hyperglycaemia or had comorbidities.

For morbidly obese people with a BMI ≥40kg/m^2 the hazard ratios were 2.15 in type 1 diabetes and 1.46 in type 2 diabetes.

'Impaired renal function was associated with an increased risk of COVID-19 related death'[3]

Compared with people with normal renal function, the risk of COVID-19 related death with an eGFR of 30–44 was 2.16 in type 1 diabetes and 1.75 in type 2 diabetes. For an eGFR <15, the risk was 6.85 in type 1 diabetes, and 4.83 in type 2 diabetes.

Care homes

Residents in Birmingham UK care homes had a prevalence of known diabetes of 12%. Including new diagnoses after glucose tolerance tests the final diabetes prevalence was 26.7%.[4] Residents are usually frail and elderly. Is lack of diabetes care in care homes contributing to the high COVID-19 mortality of their residents? Diabetes UK has advice on managing diabetes in care homes.[5]

Other studies

The OpenSAFELY group studied 17,425,445 adults in English GP practices. Among 5683 deaths attributed to COVID-19, being male, older, socially deprived, black or

Asian, and having uncontrolled diabetes (HbA_{1c} >58mmol/mol, 7.5%) increased the risk of death.[6]

In a US study of 1122 people with COVID-19 in hospital, 451 had diabetes (defined as HbA_{1c} ≥6.5%) and/or uncontrolled hyperglycaemia among whom 28.8% died compared with 6.2% of other patients.[7]

A retrospective study in China found 952 people with type 2 diabetes among 7337 people with COVID-19. Compared with those without diabetes, people with diabetes had a higher mortality (7.8% versus 2.7%). In those in whom glucose variability was within 3.9–10.0mmol/L, mortality was reduced compared with hyperglycaemic people.[8]

Act now

People with diabetes are dying with COVID-19. It is highly likely that risk factor control by good diabetes care could reduce the impact of COVID-19 in diabetes.

Share Diabetes UK's advice with people with diabetes.[9,10]

Handwashing

Repeated, regular, 20-second handwashing is vital. Remind every patient (and yourself) every time. A cleaning company observed the washroom habits of 100,000 people in Europe in 2015. 'Anonymous monitoring of 100,000 people reveals that only 38% of men and 60% of women wash their hands after going to the toilet.'[11]

Hyperglycaemia and weight

Help people to control their blood glucose to within their safe limits. Try to help people with morbid obesity lose weight and address comorbidities.

Renal impairment

Prevent renal impairment with good blood pressure and glucose control. People with eGFR <15 and diabetes are highly vulnerable. Check Kidney Care UK's detailed advice about self-isolating (shielding) for each patient.[12]

Men, older people, BAME ethnicity, socio-economic deprivation

Regularly remind these people about self-protection. Seek and treat additional risk factors.

Resume diabetes services

We clap NHS workers for good reason. Health care professionals around the world have been working to exhaustion during the pandemic, at considerable personal risk. Suggestions about increasing your workload are unlikely to be welcome. You're reading this because you have an interest in diabetes. If you have been redeployed to other areas it may now be time to look at where your expertise is best used.

The pandemic continues but the catastrophic effect of COVID-19 on people with diabetes means that diabetes care, where paused, must be resumed as quickly as possible, as safely as possible.

Help high risk people first. An HbA_{1c} ≥86mmol/mol (10%) was found in 11.8% of people with type 1 diabetes, and 6.1% of those with type 2 diabetes.[3] Find your patients with an HbA_{1c} ≥86mmol/mol (10%), a BMI of ≥40kg/m^2, or an eGFR <15. Contact them to agree individualised care for improvement and safety if not already in place.

Hospital attendances for non-COVID-19 reasons have fallen. Mortality from non-COVID-19-linked causes rose (including among people with diabetes[3]). People with diabetes have complications and comorbidities which can maim or kill, such as diabetic foot disease. Consider restarting specialist and hospital diabetes services through remote consultations and sharing glucose data on line, with prompt face-to-face reviews under safe conditions if needed.

Primary care and diabetes specialist services have worked hard to protect patients but arrangements have been very challenging during the pandemic. Despite the difficulties, every person with diabetes must be able to access knowledgeable diabetes care promptly.

Hospital specialist diabetes teams have had to reduce inpatient care. Yet COVID-19 patients often have diabetes and are at great risk of dying from it. They, and other inpatients, should have access to diabetes specialist advice. Advice is available for non-specialists on inpatient diabetes care.[13]

Summary

- People with diabetes are more likely to die from COVID-19 than those without diabetes.
- Share Diabetes UK's advice with patients.
- Hyperglycaemia is associated with increased COVID-19 mortality. Control blood glucose safely.
- Obesity risks increased COVID-19 mortality. Help obese people lose weight.
- People with renal impairment and diabetes are at high risk of death from COVID-19. Check to see if each person with an eGFR <15 should be self-isolating.
- Among people with diabetes, men, older people, those from BAME ethnicity, those living with socio-economic deprivation are more likely to die from COVID-19 than those without these factors. Seek and manage treatable risks.
- Improve diabetes management in care homes.
- Everyone with diabetes must have access to diabetes care. Re-establish interrupted services as soon as possible in a safe way for staff and patients.

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Comments

Some studies[2,3,6] were released online before peer review after which some content may change.

Declaration of interests

RH was National Clinical Director for Diabetes, Department of Health.

References

1. Smallcombe M. 'Tributes have been paid to a popular member of a Cornish theatre group who died after contracting coronavirus.' CornwallLive. 8 April 2020. https://www.cornwalllive.com/news/cornwall-news/tributes-popular-cornwall-actor-dentist-4032355 [accessed 20 May 2020].
2. Barron E, *et al.* Type 1 and Type 2 diabetes and COVID-19 related mortality in England: a whole population study. NHS England. https://www.england.nhs.uk/wp-content/uploads/2020/05/valabhji-COVID-19-and-Diabetes-Paper-1.pdf [accessed 20 May 2020].

3. Holman N, *et al*. Type 1 and type 2 diabetes and COVID-19 related mortality in England: a cohort study in people with diabetes. NHS England. https://www.england.nhs.uk/wp-content/uploads/2020/05/Valabhji-COVID-19-and-Diabetes-Paper-2-Full-Manuscript.pdf [accessed 20 May 2020].
4. Sinclair AJ, *et al*. Prevalence of diabetes in care home residents. *Diabetes Care* 2001;24(6):1066–8.
5. Diabetes UK. Diabetes in Care Homes. 2010. https://www.diabetes.org.uk/resources-s3/2017-09/Care_homes_report2010_0.pdf [accessed 21 May 2020].
6. Williamson E, *et al*. OpenSAFELY: factors associated with COVID-19-related hospital death in the linked electronic health records of 17 million adult NHS patients. https://www.medrxiv.org/content/10.1101/2020.05.06.20092999v1.full.pdf [accessed 20 May 2020].
7. Bode B, *et al*. Glycemic characteristics and clinical outcomes of COVID-19 patients hospitalized in the United States. *J Diabetes Sci Technol* 2020 May 9. doi: 10.1177/1932296820924469 [accessed 21 May 2020].
8. Zhu L, *et al*. Association of blood glucose control and outcomes in patients with COVID-19 and pre-existing type 2 diabetes. *Cell Metab* 2020;31:1–10.
9. Diabetes UK. Updates. Coronavirus and diabetes. https://www.diabetes.org.uk/about_us/news/coronavirus [accessed 20 May 2020].
10. Diabetes UK. Latest statistics on coronavirus deaths in people with diabetes. https://www.diabetes.org.uk/about_us/news/coronavirus-statistics [accessed 20 May 2020].
11. Rentokil Initial. The female of the species is more cleanly than the male. 27 February 2015. https://www.rentokil-initial.com/media/news-releases/news-2015/initial-launches-hygiene-connect-27-2-15.aspx [accessed 21 May 2020].
12. Kidney Care UK. Which people with kidney disease are advised to self-isolate/shield? 21 May 2020. https://www.kidneycareuk.org/news-and-campaigns/coronavirus-advice/#selfisolate [accessed 21 May 2020].
13. Association of British Clinical Diabetologists. COVID-19 (Coronavirus) Information for Healthcare Professionals. 12 May 2020. https://abcd.care/coronavirus [accessed 21 May 2020].