Since its appearance in 2019, the SARS-CoV-2 virus and related pandemic has challenged healthcare systems all across the world. The immune response from vaccination in type 1 diabetes is well recognised. What is less clear is the effect of vaccination on glycaemic control. Evidence is increasing that some people with type 1 diabetes mellitus (T1DM) experience temporary instability of blood glucose (BG) levels post-vaccination which normally settles within a few days.

In a retrospective analysis, we examined the BG profile of 96 consecutive adults (age ≥ 18 years) with T1DM using the FreeStyle Libre® flash glucose monitor in the periods immediately before and after their first COVID-19 vaccination. All were on a basal bolus regime of long acting analogue insulin (Insulin Degludec/Glargine) and prandial short acting analogue insulin (Insulin Aspart/Insulin Lispro). Additional oral hypoglycaemic therapy was used by \( n = 26 \) individuals.

The primary outcome measure was percentage (%)BG readings within the designated target range 3.9 to 10 mmol/L as reported on the LibreView® portal for 7 days prior to the vaccination (week −1) and 7 days after the vaccination (week +1).

Fifty-nine percent of individuals experienced major perturbation of BG levels with 30% of individuals showing a decrease of time within range of over 10%, and one in ten individuals showing a decrease in time within range of over 20% (Figure 1 shows change in %BG on target for those whose control deteriorated by >3% vs the rest). There was a small but significant overall decrease in the % of readings on target for the 7 days following vaccination (mean 52.2% ± 2.0%) vs pre-COVID-19 vaccination (mean 55.0% ± 2.0%). Importantly there was no difference in vaccine effect between the AstraZeneca and Pfizer vaccines.

Clinical data supports a robust neutralizing antibody response in COVID-19 patients with diabetes. Notably vaccination for influenza has also been noted to cause blood glucose levels to become unstable for a time, perhaps related not only to a reaction to the attenuated virus but also to the excipi-
Heald et al. Our findings do indicate that patients with T1DM should be counselled and prepared for possible transient hyperglycaemia following the COVID-19 vaccine.

In conclusion, in T1DM, we have shown that first COVID-19 vaccination can cause temporary perturbation of BG in many individuals, with this effect more pronounced when HbA1c is lower. There was no difference in effect between the vaccines administered in the UK in early 2021.

**Abbreviations**

BG, blood glucose; T1DM, type 1 diabetes mellitus.

**Declaration of Conflicting Interests**

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**ORCID iD**

Adrian H. Heald https://orcid.org/0000-0002-9537-4050

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