

RISK FACTORS

Glucose levels on hospital admission predict risk of diabetes mellitus

Blood glucose levels measured within 2 days of admission to hospital are linearly associated with the risk of developing type 2 diabetes mellitus (T2DM), according to the results of a Scottish study published in *PLoS Medicine*. The findings could be used to inform patients of their long-term risk of T2DM and to target follow-up and lifestyle advice to those at highest risk.

“Clinicians often encounter patients without diabetes who, after having a routine panel of blood tests on admission to hospital, are found to have mild-to-moderately raised blood glucose levels,” explains study leader David McAllister. “We realized that we didn’t know how to interpret this finding as high glucose levels could reflect either underlying T2DM or simply stress hyperglycaemia—a reversible condition in which illness-induced hormonal changes stimulate hepatic gluconeogenesis.”

Linking data from the national diabetes register in Scotland (SCI-DC) with data on

emergency hospitalizations, which included blood test results on admission to hospital, the researchers retrospectively analysed a cohort of 86,512 patients aged ≥ 40 years who had an emergency admission to hospital between 2004 and 2008. Incident T2DM was defined as having T2DM recorded on SCI-DC between 31 days and 3 years after discharge from hospital.

Overall, the 3-year risk of developing T2DM was 2.3%, but ranged from $<1\%$ for patients with glucose levels ≤ 5 mmol/l to $\sim 15\%$ for those with glucose levels of 15 mmol/l. Reassuringly, most patients did not develop T2DM within 3 years, indicating that stress hyperglycaemia rather than T2DM is the most likely diagnosis for patients with high glucose levels on admission to hospital. Patients with glucose levels 11.1–15.0 mmol/l and >15 mmol/l on admission also had higher mortality than those with levels <6.1 mmol/l (HR 1.54, 95% CI 1.42–1.68 and HR 2.50, 95% CI 2.14–2.95, respectively).



Jean-Charles Preiser of the Erasme Hospital (Brussels, Belgium), who was not involved in the study, comments: “The finding that the risk of developing T2DM is proportional to the magnitude of the admission blood glucose level is an important confirmatory result. A prospective follow-up study after hospital discharge, including regular checks for fasting glucose and/or HbA_{1c} levels, is warranted to further validate the associations revealed in this study.”

David Holmes

Original article McAllister, D.A. *et al.* Stress hyperglycaemia in hospitalised patients and their 3-year risk of diabetes: a Scottish retrospective cohort study. *PLoS Med.* **11**, e1001708 (2014)