

Diabetologia

Up front



Competition for publication in *Diabetologia* continues to grow, and less than 20% of papers are accepted. Of all the high-quality papers that appear in this month's issue I want to draw your attention to four articles that I think are particularly interesting. The articles are summarised here. Our publisher, Springer, has kindly made the full text of each of these papers freely available. I hope you enjoy reading them!

Sally M. Marshall, Editor

Impaired hypoglycaemia awareness in type 1 diabetes: lessons from the lab

Alison D. McNeilly, Rory J. McCrimmon

Our understanding of the mechanisms by which the body detects, then responds to, developing hypoglycaemia is gradually increasing. However, the reasons why these fundamental homeostatic mechanisms are disrupted in diabetes, especially following recurrent hypoglycaemia, remain elusive. In this issue, McNeilly and McCrimmon (<https://doi.org/10.1007/s00125-018-4548-8>) summarise our basic understanding of the glucose-sensing mechanisms used by the brain, and normal counterregulation via the activation of neural circuits. A failure to clear exogenous insulin, and abnormal alpha cell glucagon responses to low glucose together create a situation where hypoglycaemia is common in people with diabetes. Repeated exposure to hypoglycaemia progressively lowers the glucose level at which the counterregulatory response is triggered, reducing awareness and increasing the risk of severe hypoglycaemia. The authors propose that this latter phenomenon may result from habituation, a form of adaptive memory that occurs within key glucose-sensing regions of the brain.

Ⓣ The figures from this review are available as a downloadable [slideset](#).

The role of structured education in the management of hypoglycaemia

Ahmed Iqbal, Simon R. Heller

Hypoglycaemia prevents many individuals with diabetes from reaching therapeutic targets. Despite therapeutic advances, severe hypoglycaemia remains common in clinical practice and rates have not fallen over 20 years. In a review in this issue, Iqbal and Heller (<https://doi.org/10.1007/s00125-017-4334-z>) outline that data showing that providing structured education in self-management reduces the risk of hypoglycaemia to the same extent as modern technology. Evidence both from trials and observational studies, generally obtained in people with type 1 diabetes, demonstrates a subsequent reduction in rates of severe hypoglycaemia of around 50%, accompanied by decreases in HbA_{1c}. Thus, these programmes may abolish the exponential rise in the risk of severe hypoglycaemia, despite reductions in HbA_{1c}. Some individuals continue to experience recurrent hypoglycaemia and impaired hypoglycaemia awareness even with structured education; these individuals may benefit from educational interventions that also address psychological issues. The authors argue that structured education should be part of routine management in all individuals with type 1 diabetes, but that it

is particularly important to ensure that those undertaking flexible intensive insulin therapy complete programmes that teach these complex skills.

④ The figures from this review are available as a downloadable [slideset](#).

Hypoglycaemia in type 1 diabetes: technological treatments, their limitations and the place of psychology

Pratik Choudhary, Stephanie A. Amiel

In this issue, Choudhary and Amiel (<https://doi.org/10.1007/s00125-018-4566-6>) discuss how new technologies in diabetes treatments, especially continuous glucose monitors and insulin pumps that can respond to the readings, are reducing the risks of hypoglycaemia in people with type 1 diabetes. However, these have not been shown to restore endogenous defences or provide protection from severe hypoglycaemia when not being worn. As the technologies improve, their potential benefit also improves; but dislike of their physical presence, time delays in producing a reading and alarm fatigue are barriers to overcome. Impaired awareness of hypoglycaemia, which is a key risk factor for severe hypoglycaemia, may reduce the ability of an individual to engage with technological solutions. It is suggested that managing expectations and providing informed educational and, sometimes, psychological support may help more people to get the most out of technology in the battle against hypoglycaemia in type 1 diabetes management.

④ The figure from this review is available as a downloadable [slide](#).

HbA_{1c}, diabetes and cognitive decline: the English Longitudinal Study of Ageing

Fanfan Zheng, Li Yan, Zhenchun Yang, Baoliang Zhong, Wuxiang Xie

Consistent evidence from longitudinal studies and clinical trials indicates that the risk of dementia is increased in individuals with diabetes. As there is currently no specific cure for dementia, early interventions targeting modifiable risk factors may offer an important way of preventing the cognitive decline that occurs over a long period prior to the onset of dementia. However, the associations of HbA_{1c} and diabetes with subsequent cognitive decline are not well established. In this issue, Zheng et al (<https://doi.org/10.1007/s00125-017-4541-7>) report that, compared with individuals with normoglycaemia, people with diabetes or prediabetes (defined as HbA_{1c} levels in the range 38.8–46.4 mmol/mol [5.7–6.4%]) had significantly faster rates of long term cognitive decline. Further HbA_{1c} levels were linearly associated with subsequent cognitive decline, irrespective of diabetes status at baseline. These findings indicate that diabetes status is longitudinally associated with the trajectory of cognitive decline over the long-term and provide further support for recommending HbA_{1c} as a marker of glucose management in clinical practice.

All text supplied by the authors.