

Management & prevention of type 2 diabetes

Diabetes and driving – an educational essential



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This important study in *Diabetes Care* addresses a key patient- and public-safety question. It is an experimental study of individuals' driving ability and decision making during a stepped hyperinsulinaemic hypoglycaemic clamp and directly tests the glycaemic awareness and decision-

making of people with diabetes when hypoglycaemic.

Some of the key facts are arresting. Sixty per cent of the individuals never tested routinely before driving. Almost half (43%) of those with type 1 diabetes with impaired awareness of hypoglycaemia decided to continue driving despite the onset of experimental hypoglycaemia. In sharp contrast only 1 of 24 (4.2%) of people with type 1 diabetes and preserved hypoglycaemia awareness chose to drive when symptomatically hypoglycaemic.

This is, in itself, not surprising as the impaired reasoning and decision-making that underlies the decision to drive when hypoglycaemic may overlap with the impaired cognition that fails to recognise developing neuroglycopenia (a brain starved of glucose – its critical fuel). These are critical issues for clinical practice and patient education; individuals with hypoglycaemia unawareness make poor driving decisions.

Much more surprising, and potentially more significant, is the fact that despite normal awareness of hypoglycaemia

25% of the people with type 2 diabetes studied decided to continue to drive when hypoglycaemic despite being certain or unsure whether or not they were hypoglycaemic. The majority of these individuals were on oral hypoglycaemic agents.

While hypoglycaemia is a less common problem in type 2 diabetes it is not insignificant and with ever more people diagnosed with type 2 diabetes, and the pursuit of ever tighter glycaemic targets, the prevalence of hypoglycaemia in this group is of growing significance. However, those with type 2 diabetes may receive much less education about the detection and treatment of hypoglycaemia and its impact on driving. They also will probably have been driving for longer and, thus, be potentially less open to influence from social pressures and further education.

One of the problems is the separation of those with impaired awareness of developing hypoglycaemia into two distinct categories – aware and unaware – where there is clearly a range of impairment. There is also a range of deterioration in psychomotor skill with hypoglycaemia with not all individuals equally affected. Nonetheless, the validated hypoglycaemia unawareness questionnaire deployed here seems to reliably identify a vulnerable group and could be deployed with other questionnaires for more targeted education. The general educational message about diabetes, driving and hypoglycaemia needs to be reinforced in individuals with type 1 diabetes and reiterated in people with type 2 diabetes on a regular basis.

DIABETES CARE

Education about hypoglycaemia and driving is essential

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓✓

1 The authors of this Netherlands-based study investigated decision-making while driving in people with type 1 and type 2 diabetes during hypoglycaemia.

2 Three groups were involved in the study. The first comprised 24 people with type 1 diabetes and normal awareness of hypoglycaemia; the second comprised 21 people with type 1 diabetes and impaired awareness of hypoglycaemia; and the third comprised 20 people with type 2 diabetes and normal hypoglycaemia awareness.

3 All individuals completed a validated hypoglycaemia awareness questionnaire and two sessions in a driving simulator.

4 In the first session participants had a plasma glucose level of 5.0mmol/l (maintained by a hyperinsulinaemic glucose clamp), and in the second this was reduced to 2.7mmol/l. They were asked if they felt hypoglycaemic and whether they would drive.

5 Only one of those with type 1 diabetes and normal awareness would drive under the effect of hypoglycaemia compared with 9 of those with type 1 diabetes and impaired awareness. In the group with type 2 diabetes a quarter of the individuals said they would drive while hypoglycaemic.

6 The results were as expected among people with type 1 diabetes but suggest that more education should be given to people with type 2 diabetes on the dangers of driving while hypoglycaemic.

Stork AD, van Haefen TW, Veneman TF et al (2007) The decision not to drive during hypoglycemia in patients with type 1 and type 2 diabetes according to hypoglycemia awareness. *Diabetes Care* **30**: 2822–6

DIABETES CARE

Admission hyperglycaemia predicts pneumonia-related mortality

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓

1 Researchers based in Denmark investigated whether or not type 2 diabetes increased the risk of death and complications following hospitalisation for pneumonia. They also looked at the prognostic value of admission hyperglycaemia in a sub-cohort.

2 This was a population-based cohort study of 29 900 adults with and without type 2 diabetes who were hospitalised for pneumonia between 1997 and 2004. Mortality ratios and risk of pulmonary complications and bacteraemia were calculated within 90 days of admission.

3 Of the total study population, 2931 had type 2 diabetes and the mortality among this group was greater than in those without the condition at 30 days (19.9% versus 15.1%, $P<0.01$) and at 90 days (27.0% versus 21.6%, $P=0.02$).

4 In terms of pulmonary complications and bacteraemia, type 2 diabetes did not predict risk following pneumonia.

5 Admission hyperglycaemia was studied in 13 574 individuals from the cohort and adjustment for this attenuated the association between type 2 diabetes and mortality.

6 High admission blood glucose levels did, however, predict death among those with type 2 diabetes, especially those with undiagnosed diabetes.

7 The authors conclude that admission glucose level is an important clinical predictor of mortality among people admitted to hospital with pneumonia.

Kornum JB, Thomsen RW, Riis A et al (2007) Type 2 diabetes and pneumonia outcomes: a population-based cohort study. *Diabetes Care* **30**: 2251–7

AMERICAN JOURNAL OF CARDIOLOGY

HDL-c associated with ISR and MACE

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓

1 As people with diabetes have a higher incidence of major adverse cardiac events (MACE) and in-stent restenosis (ISR) the authors of this study set out to determine predictors of ISR and MACE in people with diabetes who underwent percutaneous coronary intervention (PCI).

2 One hundred and ninety-one people with diabetes (mean age 65 ± 9 years) who underwent PCI were

retrospectively studied. Of these, 106 had a follow up coronary angiogram at 16 months (±2 months) and 66 developed ISR.

3 Microalbuminuria and proliferative retinopathy were not significantly associated with ISR, however, renal insufficiency was significantly associated with higher risk of MACE.

4 Serum HDL-c was significantly associated with lower incidence of ISR and MACE ($P=0.011$ and $P=0.004$, respectively). Use of drug-eluting stents also had a negative association with ISR ($P=0.04$).

Sukhija R, Aronow WS, Sureddi R et al (2007) Predictors of in-stent restenosis and patient outcome after percutaneous coronary intervention in patients with diabetes mellitus. *American Journal of Cardiology* **100**: 777–80

AMERICAN JOURNAL OF HYPERTENSION

Manidipine addition reduces UAER further

Readability	✓✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓

1 This study was undertaken to compare the effects of adding manidipine or hydrochlorothiazide (HCTZ) to candesartan on urinary albumin excretion rate (UAER) in 174 hypertensive people with type 2 diabetes and microalbuminuria.

2 Following 8 weeks of candesartan therapy (16 mg daily), the

individuals were randomised to addition of manidipine 10mg daily or HCTZ 12.5mg daily for 24 weeks. Non-responders at 4 weeks had their dose increased to 25mg daily.

3 The results indicate that addition of either agent produced greater BP reduction than candesartan alone ($P<0.05$).

4 Addition of manidipine further reduced UAER whereas HCTZ did not ($P<0.05$) and the percentage of people becoming normoalbuminuric was also significantly increased by addition of manidipine but not HCTZ ($P<0.05$).

Fogari R, Corradi L, Zoppi A et al (2007) Addition of manidipine improves the antiproteinuric effect of candesartan in hypertensive patients with type II diabetes and microalbuminuria. *American Journal of Hypertension* **20**: 1092–6

BMJ

Screening has limited psychological impact

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓✓

1 The authors of this study aimed to quantify the psychological impact of stepwise screening for type 2 diabetes in primary care as part of the ADDITION trial.

2 Invited for screening were 6416 people at risk of having undiagnosed type 2 diabetes. Another 964 acting as controls were not invited for screening.

3 Screening attendees completed a questionnaire following random blood glucose tests at 3–6 months and 12–15 months later. Controls were sent questionnaires at the same time points.

4 Anxiety scores were measured along with worry about diabetes and self-rated health.

5 The results indicated that there were no significant differences in terms of psychological impact between groups, thus suggesting that a national screening programme is unlikely to impact on individuals' psychological health.

Eborall HC, Griffin SJ, Prevost AT et al (2007) Psychological impact of screening for type 2 diabetes: controlled trial and comparative study embedded in the ADDITION (Cambridge) randomised controlled trial. *BMJ* **335**: 486

‘Admission glucose level is an important clinical predictor of mortality among people admitted to hospital with pneumonia.’

‘A national screening programme is unlikely to impact on individuals' psychological health.’