Hypoglycaemia in patients with Type 2 diabetes in the UKPDS

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Background and Aims: The UKPDS demonstrated that a more intensive blood glucose control policy can reduce the risk of diabetes related complications in patients with type 2 diabetes. The DCCT similarly showed that an intensive blood glucose control policy was beneficial in type 1 diabetes. In the DCCT however, hypoglycaemia rates of 61 per 100 person years (py) were associated with the intensive glucose control policy, and the rate increased with decreasing levels of concurrent haemoglobin A1c (HbA1c). We have examined the self-reported hypoglycaemia rates seen in UKPDS patients and investigated the relationship to concurrent HbA1c and other factors over the first six years following diagnosis of diabetes.

Materials and Methods: 2928 UKPDS patients randomised to an intensive glucose control policy following their dietary run-in period were included. Patients were asked specifically about hypoglycaemic episodes (graded from 1 to 4) at three monthly clinic visits and the grade of the most severe recorded. Episodes requiring remedial action by the patient or a third party (grade 2 or more) have been analysed. A binomial regression model was used to calculate absolute risk rates in relation to current HbA1c, concurrent therapy and sex.

Results: Hypoglycaemia rates (95%CI) for intensively treated patients, allocated to and remaining on either insulin or sulphonylurea, were 3.3 per 100 py (0.1 to 45.4). In patients treated with sulphonylurea alone there was a progressive reduction in hypoglycaemia rates with increasing HbA1c from 1.5 per 100 py (0.3 to 5.9) for concurrent HbA1c <6 % to 0.6 per 100 py (0.3 to 1.3) for HbA1c =>9 %. The reverse was seen in those treated with basal insulin where hypoglycaemia rates increased from 3.2 per 100 py (1.8 to 5.5) to 7.7 per 100 py (6.3 to 9.5) over the same HbA1c range. Female patients reported higher hypoglycaemia rates than males (3.0 (2.6 to 3.6) vs 2.2 (2.0 to 2.4) per 100 py, $p<0.0001$).

Conclusions: Hypoglycaemia rates in patients with type 2 diabetes treated with a more intensive glucose control policy were higher in females, but overall, rates were substantially lower than those seen in intensively treated patients with type 1 diabetes, even when type 2 patients were treated with insulin. Concern about hypoglycaemia should not be a major limitation to implementing more intensive glucose control in people with type 2 diabetes.