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What predicts early glycaemic control in people with type 2 diabetes?

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Background and aims: It has been demonstrated that early glycaemic control substantially reduces the risk of microvascular complications in type 2 diabetes (T2D) and may also impact on subsequent macrovascular risk. Despite the evidence of the relationship between optimal glucose control and reduction in cardiovascular risks, a significant proportion of those with T2D fail to achieve early good glycaemic control. It is not clear which patient characteristics are associated with failure to achieve early glycaemic improvement. We evaluated the association between a range of patient characteristics and early glycaemic change.

Materials and methods: We performed a retrospective cohort analysis using a primary care sentinel network in England (Royal College of General Practitioners Research and Surveillance Centre). We identified people with new onset (incident) T2D between 1st January 2006 and 31st July 2016 and both an HbA1c measurement at the time of diagnosis and one year after diagnosis. We performed a linear regression analysis to identify factors associated with the change in HbA1c value from diagnosis to one year. Factors included for analysis were; HbA1c at diagnosis, patient age, gender, ethnicity, socioeconomic status, smoking status, body mass index (BMI), comorbidities, and medication use within the first year. Socioeconomic status was measured using the official national measure; index of multiple deprivation (IMD). Associations are reported as beta coefficients (mmol/mol change in HbA1c per unit change in model factor) with associated 95% confidence intervals (CI) and p values.

Results: From 72,910 people with T2D we identified 13,873 people with incident T2D and HbA1c measurement at diagnosis and one year post diagnosis. The mean HbA1c was 62.4 (SD 23.3) mmol/mol at diagnosis, 51.9 (SD 13.5) mmol/mol at one year. The mean change in HbA1c was -12.9 (SD 22.3) mmol/mol. Greater reduction in HbA1c was seen in those with higher HbA1c at diagnosis (-0.84; 95% CI -0.80 to -0.88; p=0.000) and increasing age (-0.13; -0.02 to -0.23; p=0.020). Compared to those of White ethnicity people of Asian ethnicity had less reduction in HbA1c at one year (difference 5.59; 9.88 to 1.30; p=0.011). Gender, socioeconomic status, smoking status, BMI, and co-morbidities did not significantly affect the change in glycaemic control. Insulin use within the first year was associated with the greatest reduction in HbA1c (-4.97; -1.36 to -8.59; p=0.007). The model accounted for a moderate proportion of the variation seen in glycaemic change (multiple R-squared = 0.650).

Conclusion: A large variation in glycaemic improvement within the first year of diagnosis can be seen in practice. Those who are younger or of Asian ethnicity have a smaller reduction in HbA1c after adjusting for initial glycaemic control. Whilst we have not determined the reasons for these differences these data suggest these groups should be targeted for more intense monitoring and aggressive intervention. The most effective treatment for early glycaemic control was insulin.

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