Degludec improves minor, severe & nocturnal hypoglycaemia in Type 1 diabetes: Association of British Clinical Diabetologists (ABCD) nationwide degludec audit

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Background

- Hypoglycaemia is a significant challenge in the treatment of Type 1 diabetes (T1DM) and Type 2 diabetes (T2DM)[1]
- Insulin degludec (Tresiba®, Novo Nordisk) is an ultra long-acting analogue basal insulin
- Clinical trials in people with T1DM have demonstrated no significant differences between people treated with insulin degludec and insulin glargine in overall rates of confirmed hypoglycaemia (glucose less than 3.1 mmol/l) or rates of severe hypoglycaemia (episodes requiring 3rd party assistance), but significantly fewer episodes of nocturnal hypoglycaemia (episodes between midnight and 6am) in those treated with insulin degludec during the maintenance treatment period[2]
- Clinical trials in people with T2DM have demonstrated significantly lower rates of overall confirmed hypoglycaemia and nocturnal hypoglycaemia in those treated with insulin degludec when compared with those treated with insulin glargine, The rate of severe hypoglycaemia was also lower in insulin-naïve people with type 2 diabetes treated with insulin degludec when compared with those treated with insulin glargine[2]
- These data suggest a benefit for insulin degludec over other basal insulins in terms of a reduction in the risk of hypoglycaemia
- The ABCD nationwide degludec audit is designed to measure the clinical effect of using insulin degludec in real clinical settings in the UK
- Data regarding hypoglycaemia are collected as part of the audit

Aims

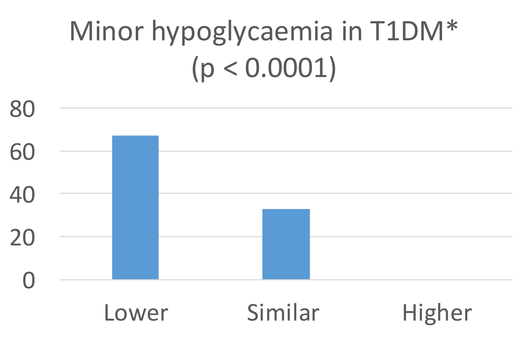
- To use data from the ABCD nationwide degludec audit to assess the effect of insulin degludec on rates of hypoglycaemia in T1DM and T2DM in clinical use in the UK

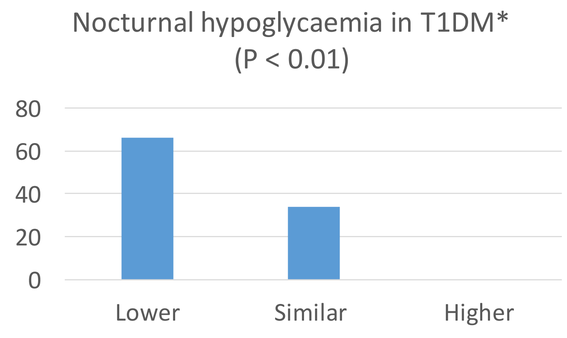
Methods

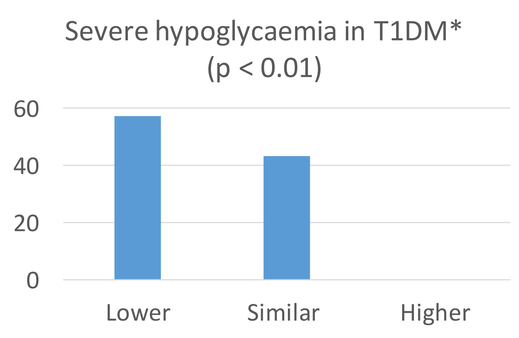
- Data was extracted from the ABCD national degludec audit for people in whom the stated reason for starting insulin degludec was hypoglycaemia
- For those with a follow-up visit, data was analysed to identify whether people reported that they were experiencing fewer, the same, or more episodes of hypoglycaemia with insulin degludec when compared with their previous basal insulin
- For the statistical analysis, we assumed that patients who cited a similar rate of hypoglycaemia using degludec and the other basal insulin in fact had a lower rate of hypoglycaemia with degludec compared to the other basal insulin with probability 0.5. We calculated 2 sided p values that a similar proportion of patients experience a lower rate of hypoglycaemia on degludec and the other basal insulin using the Normal approximation to the Binomial with a continuity correction

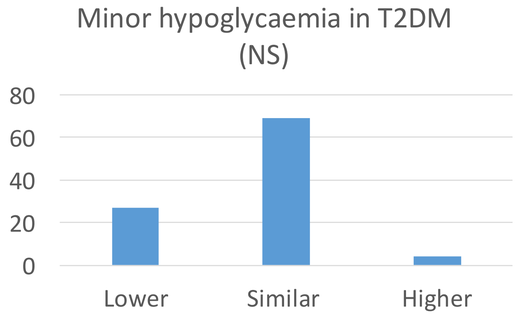
Results

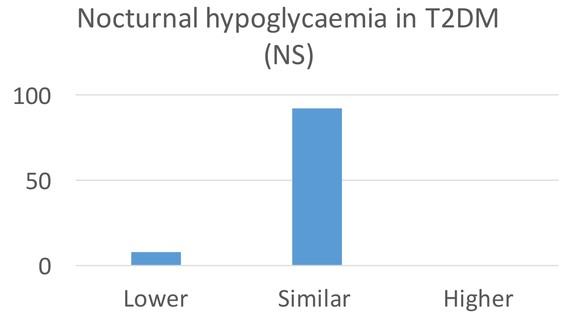
- The ABCD national degludec audit included 351 people switched to insulin degludec from another basal insulin at the time of the analysis
- Hypoglycaemia was cited as the reason for initiating insulin degludec in 164 (47%) of these, of whom 110 (67%) had type 1 diabetes and 54 (33%) had type 2 diabetes
- Comparative rates of minor, severe and nocturnal hypoglycaemia were reported in 42 (38%), 28 (25%) and 32 (29%) respectively of the 110 people with T1DM, and in 49 (91%), 24 (44% and 30 (56%) respectively of the 54 people with T2DM.
- Percentages of people reporting lower, similar or higher rates of hypoglycaemia with insulin degludec are presented in the charts below.
- For T1DM, reported rates of minor ($p < 0.0001$), severe ($p < 0.01$)and nocturnal ($p < 0.001$) hypoglycaemia were significantly lower after switching to insulin degludec from another basal insulin
- For T2DM, there was no significant difference in reported rates of minor, severe and nocturnal hypoglycaemia after switching to insulin degludec from another basal insulin although it should be noted that numbers were small. There was a trend towards improvement for minor and severe hypoglycaemia.

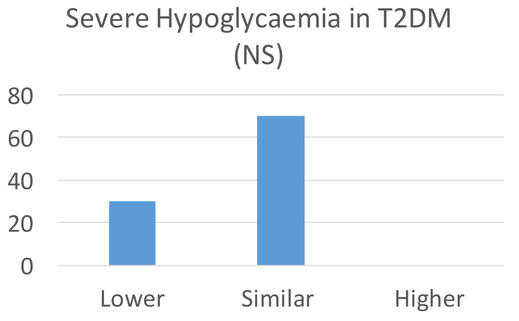












Conclusions

- The data from the ABCD nationwide audit suggest that people with T1DM who swap to insulin degludec from another basal insulin for reasons of hypoglycaemia will experience a lower rate of hypoglycaemia with insulin degludec
- For T2DM the numbers were small. No significant differences were found. For minor and severe hypoglcyaemia there was a trend towards improvement which may become significant as numbers increase.
- While the reduction in hypoglycaemia in T1DM might come from natural variation in rates of hypoglycaemia ("regression to the mean"), the fact that the same result is not observed in T2DM makes this less likely

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References

[1]Cryer PE. Hypoglycaemia: the limiting factor in the glycaemic management of Type I and Type II diabetes. Diabetologia 2002; 45: 937–948

[2]Ratner et al. Hypoglycaemia risk with insulin degludec compared with insulin glargine in type 2 and type 1 diabetes a pre-planned meta-analysis of phase 3 trials. Diabetes, Obesity and Metabolism 2013; 15: 175–18