Does type of diabetes, and treatment prescribed prior to admission influence quality of treatment of inpatient hypoglycaemia?

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CONFLICT OF INTEREST

□ I have the following potential conflicts of interest to report:

- □ Research Contracts
- X Consulting
- Employment in the Industry
- X Stockholder of a healthcare company
- □ Owner of a healthcare company
- \Box Other(s)

Novo Nordisk, Glycosys Ltd





rationale

inpatient hypoglycaemia common (43.6% T1DM admissions, 21.3% T2DM admissions)

response to hypoglycaemia known to be suboptimal

? what factors might influence response to hypoglycaemia on the ward

setting

Approaches developed from a large inpatient glucose dataset:

>7 y unbroken data
>6.5m data points (4.4M identifiable) from >200000 IDs

187691 CBGs <4mmol/l 130000 episodes of hypoglycaemia

>58k individuals with known diabetes (5k T1)

setting

CBG dataset is linked to:

SCI diabetes prescribing (encashed prescription) datasets

prescription of SU or Insulin within a 4 month period prior to admission used to associate the drug with the admission

metric used to investigate response to hypoglycaemia

Algorithm for the Treatment of Hypoglycaemia in Adults with Diabetes in Hospital

Hypoglycaemia is a serious condition and should be treated as an emergency regardless of level of consciousness. Hypoglycaemia is defined as blood glucose of less than 4mmol/L (if not less than 4mmol/L but symptomatic give a small carbohydrate snack for symptom relief).

For further information see the full guideline "The Hospital Management of Hypoglycaemia in Adults with Diabetes Mellitus" at www.diabetes.org.uk



**In patients with renal/cardiac disease, use intravenous fluids with caution. Avoid fruit juice in renal failure

time to repeat (TTR) CBG post hypoglycaemic-range CBG



what is the overall level of performance within the system?



Histogram of TTR (mins) after index CBG of <4mmol/l

TTR (minutes)



TTR (minutes)



large health board performance 09-15

what factors influence performance?

1.0 (CTTT)) proportion managed appropriately 0.8 С $^{\circ}_{\circ}$ 0.6 \cap ∞ С 0.4 00 0 0.2 C \cap ° 0 0.0 ∞ Õ 0000)(0000)(ത്ത n episodes hypoglycaemia 33/yr

most individual staff see very few hypoglycaemic episodes



initial hypoglycaemic CBG value



Capillary blood glucose monitoring, inpatient hypoglycaemia and quality of care Jones GC et al. British Journal of Diabetes & Vascular Disease (15) 124-26, 2015

effect of diagnosis and class of drug treatment

association with drug class

	type 1 diabetes	type 2 diabetes SU group	ty I
n unique IDs	4303	13015	
age	52.1(36.2-67.4)	74.7(66.7-81.4)	7:
n admissions	14046	31727	
n CBG	406423	589670	
n CBG <4mmol/l	26664	30339	



median time to repeat CBG: green – Type 1 Diabetes | black – Type 2 Diabetes Insulin | red – Type 2 Diabetes SU



Jones et al. Acta Diabetologica 2016. In press

Distribution of TTR post index CBG 3-3.9mmol/I. First 6 hours



Distribution of TTR post index CBG 3-3.9mmol/l. First 36 hours



median time to repeat CBG Early AM measurement 0600-0900: green – Type 1 Diabetes | black – Type 2 Diabetes Insulin | red – Type 2 Diabetes SU



summary/conclusion

overall performance in following guidelines poor across all types of diabetes

multiple factors influence the response to hypoglycaemia

type of diabetes and prescribed drugs associated with admissions are associated with differing levels of hyopglycaemia management performance

the group who probably have the greatest risk from moderate hypoglycaemia have the lowest level of adherence with management guidelines

an educational challenge – need to change perception of hypos in type 2 patients

? need to move away from OD CBG testing in patients on SUs