

Variable rate insulin infusions on medical and surgical wards: are we getting it right?

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Aims: A quality improvement project undertaken at University Hospital Birmingham to improve the management of patients on variable rate intravenous insulin infusions (VRiII) to allow a consistent standard of care in keeping with Joint British Diabetes Societies guidelines.

Methods: All episodes where a patient was started on a VRiII was included. Data was collected at intervals from September 2016 to November 2017. Analysed data included; supplementary intravenous fluid choice, episodes of hypoglycaemia and electrolyte imbalance. Chi-squared analysis was used to compare and assess significance of baseline and final cycle data. Action changes were implemented between cycles; presentation of results at the grand round, release and distribution of new trust guidelines, medicines management approval of JDBS suggested VRiII fluid, and medical staff education.

Results: 382 total episodes of VRiII treatment were identified across the time period. The percentage of episodes using correct fluids as per trust guidelines increased sequentially from 37% at baseline to 94% at the final cycle ($p < 0.0001$). There was a reduction in the incidence of episodes of hyponatraemia (sodium < 135 mmol/l); 28.6% to 8.3% ($p = 0.01$), and of hypoglycaemia (blood glucose < 4 mmol/l); 24.2% to 8.3% ($p = 0.03$). There was a non significant but absolute reduction in the incidence of hypokalaemia (potassium < 3.5 mmol/l) (6.6% to 2.8%, $p = 0.38$).

Conclusion: Action changes instigated within the trust improved the treatment of patients on a VRiII with significant improvement in the correct fluid use and reduced episodes of hypoglycaemia and electrolyte imbalance.