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

An initial baseline of data was identified from the database; any episode where a patient was started on a VRIII over a 10-week period from 1 September to 10 November 2016. ITU patients and those on a scale for less than 1 hour were excluded. These were then analysed against three subsequent 2-week cycles of data in January, February and March 2017. Analysed data included demographics, length of VRIII, adherence to continuing long-acting insulin/stopping other diabetic medication, frequency of blood glucose measurements, fluid and potassium administration and episodes of hypoglycaemia and electrolyte imbalance. Action changes were implemented between cycles. After the baseline data were collected, the results were presented at the grand round. After the first cycle new trust guidelines were approved and released on the intranet. Following the second cycle, the guidelines were distributed as posters across the hospital and along with formal clinical staff education.

Results

One-hundred and eighty-two episodes of patients on a VRIII were identified in the initial baseline cohort and 23, 27 and 16 episodes in January, February and March 2017, respectively. The percentage of episodes using correct fluids as per trust guidelines increased from 37% at baseline to 62% at the third cycle. Potassium addition to fluid increased from 40% to 56%. Daily urea and electrolyte measurement increased from 61% to 69% with the total percentage of episodes where the patient became hyponatraemic (sodium <135 mmol) decreasing from 29% to 13%. The total number of hypoglycaemic episodes across all patients reduced from 44 within the baseline group to zero in the third cycle. The frequency of blood glucose measurements remained unchanged, sitting under the target of one per hour (0.9) at the third cycle. There was slight improvement in the percentage of episodes in which basal insulin was continued (64% to 71%) and other diabetic medications stopped (74% to 100%).

Conclusion

Action changes of new trust guidelines distributed on the intranet and as posters, as well as proper clinical staff education, improved the treatment of patients on a VRIII with marked improvement in the correct fluid use, reduced episodes of hypoglycaemia and electrolyte imbalance and improved adherence to continuing long-acting insulins as well as pausing other diabetic medication. ∎

Conflict of interest statement

There were no conflicts of interest while undertaking this quality improvement project.

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