Management of diabetic ketoacidosis – effect of a quality improvement programme and its long-term follow-up

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Aims

To study the effect of a quality improvement programme (QIP) on the overall care for patients admitted with diabetic ketoacidosis (DKA).

Methods

Patients aged ≥17 years admitted with DKA from April 2014 to September 2016 at a large teaching hospital in the West Midlands were included in the study. Patients managed in intensive care units were excluded to avoid bias from one-to-one care. Various interventions were introduced from October 2014 to March 2015 to improve DKA care as part of the QIP. The study period was divided into five groups of 6 months: baseline (52), intervention (52), early (53), intermediate (66) and late- (36) follow-up period. Data measuring socio-demographic profile (age, gender, ethnicity) and various aspects of DKA management (presenting aetiology, glucose and ketone monitoring, prescribing fixed-rate insulin infusion and fluids) were collected and analysed using Microsoft Excel (version 2010) Statistical Analysis Software Package version 23 (IBM Corp., USA). The primary outcome of the study was measured by the effect on DKA duration. Results are expressed in percentage and median with interquartile range (IQR) as appropriate.

Results

A total of 259 DKA episodes (male:female, 1:1.14) were analysed. There was no significant difference in the age between the groups. Poor compliance (32.1%) was the most common precipitating factor of DKA during the study. Glucose was monitored hourly in 91.7% (IQR, 83.3–108.2%) in pre-intervention, 91.7% (IQR, 75.0–114.6%) in intervention, 116.7% (IQR, 91.7–150.5%) of early, 125.2% (IQR, 100.1–149.1%) in intermediate and 120.3% (IQR, 91.4–143.9%) in late follow-up groups respectively. Hourly ketone monitoring was met in 58.3% (IQR, 25.0–80.6%) in pre-intervention, 50.0% (IQR, 33.3–73.0%) in intervention, 42.2% (IQR, 26.2–66.9%) in early, 61.3% (IQR, 41.2–83.8%) in intermediate and 51.5% (IQR, 26.3–71.4%) in late follow-up patients respectively.

The duration of DKA during the five groups as defined above were 20.5 hours (IQR, 12.5–41.1 hours), 16.6 hours (IQR, 11.9–27.9 hours), 11.5 hours (IQR, 7.1–20.7 hours), 7.4 hours (IQR, 5.0–11.3 hours) and 9.0 hours (IQR, 6.8– 15.6 hours) respectively. Overall, there was statistically significant reduction in DKA duration following intervention, and the effect of QIP persisted up to 1 year post-intervention.

Conclusions

A well-designed QIP based on specific targets and continued feedback improved the quality of care for DKA. Although there was a significant reduction in DKA duration through our QIP, an increasing DKA duration trend during long-term follow-up suggests the need for ongoing interventions to maintain the improvements. ■

Conflict of interest statement

None.

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