

# Trends in rates of complications and adverse outcomes in diabetic ketoacidosis following changes to the Joint British Diabetes Societies' management guidelines

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## Introduction

Serious complications of diabetes-related ketoacidosis (DKA) and its management with fixed rate intravenous insulin infusion (FRIII) include hypoglycaemia, hyperkalaemia and hypokalaemia. Revised Joint British Diabetes Societies for Inpatient Care (JBDS) guidelines in June 2021 recommend a reduced rate FRIII of 0.05 units/kg/hour from 0.1 units/kg/hour once blood glucose levels fall to  $\leq 14.0$  mmol/L to alleviate the risk of these complications.<sup>1</sup>

## Materials and methods

The aim of this study was to study the impact on trends of hypoglycaemia, hyperkalaemia and hypokalaemia in DKA prior to and following the JBDS guideline update. We performed a retrospective analysis of all DKA admissions between February and November 2021 across six hospitals in the UK. Three out of the six hospitals have updated their management guidelines to reflect the new national recommendations. The trends in hypoglycaemia, hyperkalaemia and hypokalaemia episodes pre- (February to June) and post-guideline update (July to November) were compared.

## Results and discussion

In total, 220 (February–June) and 188 (July–November) DKA admissions were identified. 23 (10.5%) patients experienced hypoglycaemic episodes prior to the guideline update compared with 29 (15.4%) patients post-guideline update ( $p=0.116$ ). 55 and 58 episodes of hypoglycaemia were identified pre- and post-guideline update, respectively. 82 (37.3%) admissions pre-guideline update experienced episodes of hyperkalaemia compared with 51 (27.1%) admissions post-guideline update ( $p=0.306$ ). Additionally, 67 (30.5%) patients experienced hypokalaemic episodes pre-guideline update compared with 72 (38.3%) patients

post-guideline update ( $p=0.033$ ). Overall, 141 and 142 episodes of hypo- and hyperkalaemia were identified pre-guideline update in comparison with 189 and 72 hypo- and hyperkalaemic episodes post-guideline update. The median DKA duration was 13.5 hours (interquartile range (IQR) 9.0–20.6) in February–June vs 14.1 hours (IQR 9.6–19.7) in July–November ( $p=0.424$ ). Median length of stay was 4.4 days (IQR 2.3–8.2) in February–June vs 3.4 days (IQR 2.0–6.7) in July–November ( $p=0.58$ ) respectively. Lack of awareness and understanding was listed as the reason for minimal changes in complications and outcome post-guideline update.

## Conclusion

With an exception a higher number of hypokalaemic episodes was observed after the guideline revision, there were no significant changes in the complications or outcomes of DKA. These findings suggest more work needs to be done in implementing and educating the end-user to improve the anticipated outcomes from the revised guidelines. ■

## Reference

- 1 Joint British Diabetes Societies for inpatient care. *The management of diabetic ketoacidosis in adults*. JBDS 02. JBDS-IP, 2021.

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