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Assessment of a Diabetic Ketoacidosis Management Protocol in Community Hospital Settings

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Abstract

Background:

Recent studies have illustrated the benefits of implementing a protocol to manage diabetic ketoacidosis (DKA) with regards to intensive care unit (ICU) length of stay (LOS) and time to anion gap (AG) closure. The aim of this study was to assess the efficacy of a standardized nurse-driven DKA management protocol for patients in the ICU at a community hospital.

Methods:

Retrospective chart analysis comparing patients admitted to the adult ICU with diagnosis related groups consistent with diabetic ketoacidosis and who met inclusion criteria before (PRE) and after protocol implementation (POST). The primary outcome was time to anion gap closure. Secondary outcome measures included time to subcutaneous insulin, ICU length of stay, re-emergence of anion gap, episodes of hypoglycemia, and hypokalemia.

Results:

A total of 53 patients (30 PRE and 23 POST) were included. The DKA protocol was ordered in the ED among 22 patients in POST. Mean hours to AG closure from ED admission was 20.4 (PRE) and 16.1 (POST). Hours elapsed between the start of IV insulin and AG closure was significantly shorter in POST (10.49) compared to PRE (15.93). Hours to AG closure from ED admission was significantly shorter in POST (14.7) compared to PRE (20.4). In both the primary and sub-group analyses, there were no significant between-group differences for age, body mass index, serum blood glucose measured in the ED, ICU-LOS, frequencies of hypoglycemia and hypokalemia, or time elapsed between the start of IV insulin and the time SQ insulin was ordered or administered.

Conclusions:

Given the improvement in the time to anion gap closure and decreased variance in the administration of SQ insulin in this small observational study, the management of DKA using a nurse driven protocol at a small community hospital remains an option that needs further exploration.